Developing and piloting a trauma-informed yoga intervention for anxiety and depression in consumers with a chronic psychosis or mood-based disorder

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Thesis Abstract

Background: There is growing interest in yoga as an adjunct in the treatment of anxiety and depression for people with a chronic psychosis or mood-based diagnosis.

Aim: To design and evaluate the acceptability and feasibility of a yoga intervention as an adjunct treatment for consumers with a chronic mental health condition, and self-reported anxiety and/or depression.

Methods: A multiphase mixed method research design was utilised over four phases. Findings of Phases 1, 2 and 3 were used to guide the development of Phase 4.

Phase 1. *Literature review and model development*: The literature on potential biological, physiological and psychological mechanisms of change facilitated by yoga for anxiety and depression was reviewed, and a yoga mental health model developed.

Phase 2. *Yoga practice in the community*: A survey of South Australian yoga teachers (n=24) and students (n=181) was undertaken, with questions regarding demographics, yoga practice, mindfulness, self-compassion, depression and anxiety; and implications for designing a yoga intervention for mental health consumers.

Phase 3. *Stakeholder consultation*: Focus groups were held with mental health consumers (n=8) and clinicians (n=13), and interviews with yoga teachers (n=5), from October 2016-April 2017. Participants were asked about the feasibility and appropriateness of a range of yoga practice features to be tested as a yoga intervention for consumers of a mental health service.

Phase 4: *Develop and pilot a yoga intervention*: A mixed method Randomised Control Trial, which involved a 10-week yoga-based intervention (n=10) and a waitlist control group (n=8), was undertaken with consumers of a mental health service, from May-October 2018. Pre- and post-mindfulness and mental health measures were collected, and a focus group was facilitated. There was a high dropout rate from the program (10 of 18).

Results: In Phase 1, the yoga mental health model suggested that the influence of yoga on the physiological and psychological systems may lead to a reduction in anxiety and depression.

Phase 2 results showed a positive correlation with mindfulness and self-compassion, and negative correlation with depression, anxiety, and stress scores with months of practice.

Phase 3 consultation identified the following themes: that mental health understanding and experience of teachers is important; and creating a safe space, environmental design and yoga practice elements. In the Phase 4 pilot randomised controlled trial, there were no differences in outcome measures pre-compared to -post or to three months for the intervention or control group. The focus group identified the following themes: mental health benefits, lifestyle changes, yoga practice recommendations and future directions.

Discussion:

The development of the yoga mental health model to explain the proposed mental health outcomes of yoga, is a valuable tool for future research and health care services. Survey findings were consistent with other research, showing a positive correlation of yoga experience, practice frequency, and meditation with mindfulness and lower depression and anxiety scores. Consultation results including the importance of yoga teachers' mental health understanding and experience, and specific yoga practice components and environmental features, are largely consistent with trauma-informed yoga research, and can inform the health care service and future research. The pilot study demonstrated a strong acceptability of yoga-based interventions in this small sample, which is consistent with the growing research evidence.

Conclusion: Findings of this research project indicate a high level of acceptability for yoga-based interventions in this small sample of consumers, but future research is needed on its effectiveness.

Declaration

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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02/07/2021

Signature Date

List of Publications relating to this thesis

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Lastly, I dedicate my thesis to my father Steve Butterfield who passed away after a long battle with illness, just prior to me commencing my PhD in 2012.

List of Abbreviations

CI	confidence interval
DASS	Depression, Anxiety and Stress Scale
DASS21	Depression, Anxiety and Stress Scale 21
DBT	Dialectical Behaviour Therapy
DV	dependent variable
FFMQ	Five-Facet Mindfulness Questionnaire
FFMQ-SF	Five-Facet Mindfulness Questionnaire-short form
IV	independent variable
K10	Kessler 10 Psychological Distress Scale
MDD	Major depressive disorder
MBCT	Mindfulness-Based Cognitive Therapy
MBSR	Mindfulness-Based Stress Reduction
MHC	Mental Health Continuum
MHC-SF	Mental Health Continuum-short form
M	mean
n	number
P	probability
r	Pearson's correlation
RCT	Randomised controlled trial
SALHN	Southern Adelaide Local Health Network
SCS	Self-Compassion Scale
SCS-SF	Self-Compassion Scale-short form
SD	standard deviation
t	t-statistic
WHO	World Health Organisation

CHAPTER 1. Introduction

Yoga

Yoga is an ancient practice and philosophy developed in India over 5,000 years ago, with artefacts dating back to 3000 BC (Iyengar, 2001). The word yoga is a Sanskrit term meaning to join, yoke or unite, and refers to union with oneself (mind, body and breath) and the universe (Varmabally & Gangadhar, 2016). Yoga is a holistic multidimensional system of health and wellbeing incorporating mind, breath and body, as well as spiritual, ethical and lifestyle factors (de Manincor, Bensoussan, Smith … et al., 2015; Rao, Varmabally & Gangadhar, 2013).

Yoga is one of six systems of Indian philosophy, which was collated and systematised by Indian sage Patanjali, in his work the Yoga Sutras. The Yoga Sutras describe the eight limbs of yoga including the Yamas (Ethics), Niyamas (Personal observances), Asana (Postures), Pranayama (Breath-work), Pratyahara (Withdrawal from the senses), Dharana (Meditation), Dhyana (Mindfulness) and Samadi (Self-realisation/Enlightenment) (Iyengar, 2001; Varmabally & Gangadhar, 2016). Patanjali emphasised yoga as a spiritual practice with focuson developing the mind, and on how to live a meaningful and purposeful life (Iyengar, 2001).

There are three main lineages of yoga, including Hatha, Iyengar and Ashtanga yoga (de Manincor et al., 2015), which have evolved into the numerous styles and types of yoga practiced today. Modern western yoga often has more focus on the physical components, and some styles, are arguably, quite far removed from the traditional concepts of yoga. However, all yoga has the three consistent components of breath, postures and meditation.

Anxiety and depression prevalence

Anxiety and depression are common mental health conditions with increasing prevalence worldwide (World Health Organisation, 2017). Over 300 million people are estimated to experience depression globally, approximately 4.4% of the world's population. Prevalence is even higher in Australia, with 5.9% of the population estimated to experience depressive disorders and 7% anxiety disorders (WHO, 2017). Depression is ranked as the single largest contributor to global disability, and anxiety disorders are ranked 6th in the most recent World Health Organisation data (WHO, 2017). Anxiety and depression have a significant impact on individuals and families and are associated with increased disability, reduced quality of life and increased healthcare costs (Cramer, Lauche, Langhorst … et al., 2013).

Anxiety and depression in schizophrenia and psychosis-based disorders

Anxiety disorders and depression are thought to affect as many as 45% (Cosoff and Hafner, 1999) and 50% (Buckley, Miller, Lehrer… et al., 2009) respectively, of people with schizophrenia. Anxiety may co-occur spontaneously or in response to symptoms, or as a side effect of antipsychotic medication, and is less likely to be part of the condition itself (Buckley et al., 2009). Depressive symptoms may co-occur spontaneously, as part of the negative symptomology of schizophrenia or as a response to experiencing chronic schizophrenia and its impact on quality of life (Buckley et al., 2009). Similarly, the experience of a psychotic episode may be associated with increased levels of depression (Buckley et al., 2009; Birchwood, 2003) and anxiety (White, Gumley, McTaggart, et al., 2013; Achim, Maziade, & Raymond et al., 2011), and an increased sense of hopelessness about the future and perceived loss of personal and social roles are common experiences (Birchwood, 2006). Depression (Saarni, Viertio, & Perala et al., 2010) and anxiety (Huppert & Smith, 2005) have both been identified as major factors contributing to poorer quality of life in individuals with psychosis.

Yoga for anxiety and depression

There is growing interest in the role of yoga in the treatment of anxiety and depression. Yoga-based interventions are increasingly recognised as an effective adjunct treatment for depression (Cramer, Anyher, Lauche… et al., 2017; de Manincor, Bensoussan, Smith… et al., 2016; Tolahussanae, Sagar, Faiq… et al., 2018; Prathikanti, Rivera, Cochran… et al., 2017), while evidence is growing for effectiveness in treating anxiety (Cramer, Lauche, Anheyer… et al., 2018; Uebelacker & Broughton, 2016). Current primary treatments for anxiety and depression include medication, psychological therapies, electro-convulsive therapy and/or complementary and lifestyle interventions (de Manincor et al., 2015).

The role of yoga for anxiety and depression in people diagnosed with a chronic mental health condition, such as schizophrenia and other psychotic disorders, is an emerging area of research. Symptoms or a formal diagnosis of anxiety and depression may be over-looked in these consumers, with priority given to mental health conditions considered more severe and/or enduring. For example, psychotic symptoms may be the focus of treatment, and underlying anxiety and/or depression may be more evident later or develop later as a result of chronic psychosis **(**Buckley et al., 2009). Yoga could offer this cohort of consumers an appealing adjunct treatment that may empower them to have more choice and control over their care.

Yoga and mindfulness

Mindfulness is being fully engaged in the present moment, with awareness of thoughts, feelings and sensations without judgement (Kabat-Zinn, 1990). Mindfulness interventions are growing in popularity for a range of mental and physical health conditions in a variety of health care settings (Baer, Lykins, & Peters, 2012; Salmon et al., 2009). Mindfulness-based Stress Reduction (MBSR) and Mindfulness-based Cognitive Therapy (MBCT) are well established

structured group programs which have demonstrated positive outcomes for stress, anxiety (da Silva, Ravindran, & Ravindran, 2009; Kabat-Zinn, 1990) and depression (Baer, 2003; Davis & Hayes, 2011; Kabat-Zinn, 1990). Mindfulness interventions are thought to work by reducing negative rumination, encouraging a non-judgemental approach to self and others, and promoting positive thinking (Baer et al., 2012).

Mindfulness is thought to play an important role in yoga and is linked to reported positive effects on anxiety and depression (Brisbon & Lowery, 2011; Knight, Pultinas, Collins… et al., 2014; Salmon, Lush, Jablonski… et al., 2009). Yoga is often referred to as 'mindfulness in motion' (Salmon et al., 2009) and some preliminary research has suggested that yoga may increase mindfulness levels (Conboy, Wilson, & Braun, 2010; Shelov, Suchday, & Friedburg, 2009). However, the potential of movement-based mindfulness interventions, such as yoga on mental health outcomes for anxiety and depression has not been well researched.

Current research challenges

Evaluating the effectiveness of yoga for anxiety and depression requires randomised controlled trials (RCTs), which include randomisation, blinding and appropriate controls (Gangadhar, 2014). However, the personal nature of yoga practice and wide variation in styles, class components and teaching methods makes standard research design problematic and often inconsistent with yoga philosophy (de Manincor et al., 2015; Salmon et al., 2009; Sherman, 2012). Further high quality and creative research that captures the essence and experience of yoga is needed to determine whether it is an effective adjunct intervention for anxiety and depression.

Aims and objectives

The main aim of this research project was to design and evaluate the acceptability and feasibility of a yoga intervention for consumers of a mental health service who have chronic psychosis or a mood-based disorder and self-report anxiety and/or depression. To facilitate this aim, Phase 1 of the research was to review the literature and identify a potential model of the way in which yoga may improve outcomes for people with mental health conditions. Phase 2 involved surveying yoga teachers and students in the general population to examine the personal and practice characteristics and experience of current yoga teachers and students in the community, and to assess their levels of mindfulness, self-compassion, stress, anxiety, depression and wellbeing; and use the study findings to inform the later design of a yoga intervention. The rationale for surveying the general yoga community was partly due to exploring the possibility of mental health consumers integrating into general community yoga classes. Phase 3 aimed to gain an understanding of the perspectives of consumers, staff and yoga teachers on developing a yoga intervention for consumers of a mental health service. Phase 4, the pilot study aimed to examine the acceptability and feasibility of a yoga intervention with consumers of a community mental health service, and to provide recommendations for future health care delivery and specific strategies for the role of nursing practice.

Across four phases, the objectives of the study included:

Phase 1. Literature review and model identification

- Reviewing the literature on the role of yoga in managing anxiety and depression, and implications for health professionals
- Identifying a potential model of how yoga may improve outcomes for people with mental health conditions

Phase 2: Yoga practice in the community

- Surveying yoga teachers and students to measure their teaching characteristics and practice characteristics, respectively, and their levels of mindfulness and self-compassion
- Testing for relationships between home practice, class frequency, class length, meditation and practice experience on levels of mindfulness, self-compassion and mental health outcomes (depression, anxiety and stress and wellbeing)
- Identifying key components for designing a yoga intervention

Phase 3: Stakeholder consultation

- Developing an understanding of what mental health consumers, staff and yoga teachers believe is feasible and appropriate in the design of Phase 4 – Pilot yoga course with mental health consumers
- Obtaining specific details regarding recommended duration of practice, frequency of practice, style and components of practice, specific poses, home practice, yoga teacher's style and experience, use of props and environmental factors (e.g., use of candles, music), for this client group selected from the three separate consultation groups
- Collating information, along with findings from Phase 1 (Literature review) and Phase 2 (Yoga surveys) and existing research and protocols to develop Phase 4 – Pilot yoga course with mental health consumers

Phase 4. Develop and pilot a yoga intervention

- Collating Phase 1, Phase 2 and Phase 3 findings, along with existing research and protocols to develop a 10-week yoga intervention with mental health consumers
- Piloting a 10-week yoga intervention with mental health consumers: a randomised controlled trial comparing pre- and post-psychological and mental health measures, and a focus group (Phase 4). The consumers were recruited from a community mental health service and had a diagnosis of either a chronic psychosis or mood-based disorder, in addition to self-reported anxiety and/or depression symptoms.

The research questions considered included:

- Do mindfulness and self-compassion levels improve with regular yoga practice, and are there any relationships to mental health outcomes (stress, depression, anxiety, and wellbeing)?
- Is there a relationship between mindfulness and self-compassion levels?
- Are there components of yoga practice (home practice, class frequency, class length, meditation and practice experience) that are associated with improved mindfulness and self-compassion levels, and mental health outcomes?
- Is a yoga intervention for mental health consumers with a chronic psychotic or mood diagnosis along with anxiety and depression effective in improving mindfulness and self-compassion and reducing stress, anxiety and depression symptoms?

This thesis is comprised of eight chapters, starting with this general introduction. Chapter 2 is a published literature review (Phase 1), providing background information on the potential biological, physiological and psychological mechanisms of change facilitated by yoga for anxiety and depression, current yoga and mental health research, implications for health

professionals and limitations including articles up until 2015. The yoga mental health model, which describes the physiological and psychological mechanisms of yoga on the stress response and proposed mental health outcomes is introduced. Chapter 3 updates the literature review and includes relevant research from 2015 to early 2021. Chapter 4 is an overview of the methodology and mixed methods research design used in this research study. Chapters 2 and 5-7 detail the Four Phases of the research project, including three published articles and one submitted for publication. Chapter 5 is a published article on Phase 2 of the research, which involved a survey of South Australian yoga teachers and students' demographics, yoga practice characteristics, mindfulness, self-compassion, depression and anxiety, and implications for designing a yoga intervention. Chapter 6 is a published article on Phase 3 of the research, which involved focus groups with mental health consumers and clinicians, and interviews with yoga teachers, to gain their perspectives on designing a yoga intervention appropriate for mental health consumers with a chronic psychotic or mood diagnosis along with anxiety and depression. Chapter 7 is an article that has been submitted for publication on Phase 4 of the research, which examined the acceptability and feasibility of a 10-week pilot yoga intervention for mental health consumers with a psychosis or mood-based disorder in addition to self-reported anxiety and/or depression. Chapter 8 provides the final discussion and conclusions of the research study.

CHAPTER 2. Yoga and mindfulness for anxiety and depression and the role of mental health professionals: a literature review

Please note: The published article is included as Appendix 1

Statement of authorship

Title of paper:	Yoga and mindfulness for anxiety and depression and the role of mental health professionals: a literature review
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Principal author name:	Nicole Butterfield (now known as Nicole Snaith)
Contribution to paper:	Developed the research proposal; conducted searches and retrieved papers; wrote and revised the manuscript based on supervisor and reviewer feedback.
Overall percentage:	80%
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper

28/06/2021

Signed Date

CO-AUTHORS

By signing the Statement of Authorship, each co-author certifies that:

The candidate's stated contribution to the publication is accurate (as stated above).

Permission is granted for the candidate to include the publication in the thesis; and

The sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

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Signed	28/06/2021 Date
Co-author name:	Dr Michael Proeve
Contribution to paper:	Provided guidance, assistance, and critical feedback throughout all steps of this research
Signed	28/06/2021 Date

Abstract

Purpose: The purpose of this paper is to examine the role of yoga in the management of anxiety and depression, development of mindfulness and self-compassion and implications for mental health care delivery and mental health professionals, with a specific focus on nursing practice.

Design/methodology/approach: A search of electronic databases Scopus, CINAHL, EMBASE, Medline and Cochrane Library was undertaken.

Findings: There is growing research evidence supporting the use of yoga as an adjunct or combination therapy for the management of stress, anxiety and depression. Mindfulness has been indicated as a potential mechanism of change but needs further research. Health care professionals may play an important role in supporting consumers to engage in yoga as part of their mental health care.

Research limitations/implications: Yoga research to date has been limited by methodological weaknesses including wide variation of yoga practices, styles and teaching methods; difficulties in double blinding, suitable placebo-control; lack of randomised controlled trials and small sample sizes. The literature highlights that more high-quality yoga and mental health research is needed.

Practical implications: The paper introduces the potential role of yoga for anxiety and depression in the health care system and the role of mental health professionals in implementing and promoting holistic yoga-based therapies.

Originality/value: This paper proposes a yoga model for mental health and provides insight into a proposed new direction for future mental health care and the role of nursing practice and other mental health professionals.

Keywords: anxiety, depression, mental health, mindfulness, yoga

Introduction

Anxiety and depression are significant mental health problems in Australia and other parts of the world (Louie, 2014; Pilkington, Kirkwood, & Rampes et al., 2005; Smith, Hancock, & Blake-Mortimer et al., 2007). In 2011, mood disorders (9.7 %) and anxiety (3.8 %), were the most prevalent mental health conditions in Australia (Australian Bureau of Statistics, 2012). The World Health Organisation reports that one in five people will experience depression at some time in their life and estimates that depression will be the world's leading health problem by 2020 (WHO, 2012).

Depression and anxiety can have a significant impact on individuals and families and are associated with increased disability, reduced quality of life and increased healthcare costs (Cramer et al., 2013). Stress, anxiety and depression are closely linked, as stress may precipitate or exacerbate symptoms of depression and anxiety and depression may cause acute or chronic stress (Kinser, Goehler, & Taylor, 2012). Exposure to prolonged stress can have a cumulative effect on the body and lead to reduced coping capacity and poorer long-term physical and psychological health. Stress can cause chronic over stimulation of the sympathetic nervous system, which may be a result of the modern lifestyle (Kinser, Bourguignon, Whaley… et al., 2013b). Personality and genetic predisposition may also play a role in the development of stress, depression and anxiety (Kinser et al., 2012).

Pharmacological treatments, psychological therapies, electro-convulsive therapy, complementary and lifestyle programmes and combinations of these interventions are conventional treatments for depression and anxiety (de Manincor et al., 2015; Henderson, 2002; Uebelacker, Epstein-Lubow, & Gaudiano… et al., 2010a). However, there are significant concerns of side effects, individual choice, compliance, effectiveness, stigma, access to

services, cost effectiveness, ethics and long-term benefits of some of these treatments (de Manincor et al., 2015). The stigma experienced with mental health problems and the limitations of conventional treatments such as side effects, effectiveness, access and cost, haveled to people seeking alternatives to mainstream approaches (de Manincor et al., 2015; Henderson, 2002). Mindfulness-based and holistic mind-body therapies are increasing being adopted for the management of anxiety and depression (Pilkington et al., 2005; Uebelacker, Tremont, & Epstein-Lubow… et al., 2010b).

Yoga is increasingly being recognised as an effective intervention for a range of mental and physical health conditions (Brown & Gerbarg, 2005; Field, 2011). An ancient tradition developed in India over 5,000 years ago, yoga is based on a holistic health system that incorporates mind, breath and body as well as spiritual, ethical and lifestyle factors (de Manincor et al., 2015; Rao et al., 2013). Mindfulness is thought to play an important role in the mental health benefits of yoga; however, the exact mechanism is not well understood and may be a combination of biological, physiological and psychological processes (da Silva et al., 2009; Field, 2011). This literature review examines the research on yoga for anxiety and depression, potential mechanisms of change including the role of mindfulness and self-compassion, and implications for health care professionals.

Methods

An electronic literature search was undertaken using Scopus, CINAHL, EMBASE, Medline and Cochrane Library databases for papers from 2000 to 2015. The search terms of yoga and/or mindfulness and/or self-compassion and mental health and/or mental health nursing; yoga and anxiety and/or depression were used. The search was limited to papers in English, research involving adults with anxiety and/or depression and random controlled trials were used where

available. Papers which focussed on a specific age group, comorbidities, pregnancy/prenatal yoga, physical health or other specific conditions were excluded. Secondary references were selected from the primary paper references and contacting expert academics in the field.

Yoga potential mechanisms of change for anxiety and depression

The exact mechanism of the reported mental health benefits from yoga are not well understood (da Silva et al., 2009; Field, 2011). Sherman (2012) proposes that the physical postures (asana), breath work (pranayama), meditation (dhyana) as well as relaxation, and the spiritual and mindfulness aspects of yoga may all contribute to mental health benefits reported. The mechanism by which yoga mediates psychological benefits is likely influenced by a number of biological, physiological and psychological factors (da Silva et al., 2009), which will be further discussed.

Biological and physiological mechanisms

Depression and anxiety have been described as disorders of the biochemical and neurophysiological systems and have been shown to adversely affect the chemicals that regulate mood in the brain (noradrenaline, serotonin, dopamine), the neurotransmitter gamma amino-butyric acid and cortisol levels (Cramer et al., 2013). Yoga is thought to have a positive effect on biochemical and neurophysiological systems, including regulating the autonomic nervous system and stress response and thereby reduce symptoms of stress, anxiety and depression (Brown & Gerbarg, 2005; Salmon et al., 2009) (Figure 1).

A stressor triggers the sympathetic nervous system to activate a chain of events, including an increase in blood pressure, heart rate and breath rate and release of cortisol, called the 'fight or flight' stress response (Ross & Thomas, 2010) (Figure 1). Regular yoga practice decreases the sympathetic nervous system stress response and activates the parasympathetic nervous system to reduce blood pressure, heart rate and breath rate, and is linked to a decrease in stress and anxiety levels (Brown & Gerbarg, 2005; Cramer et al., 2013) (Figure 1). Furthermore, the release of the 'stress hormone' cortisol has been shown to reduce immediately following yoga practice (Michalsen, Grossman, & Acil… et al., 2005; Yadav, Magan, & Mehta… et al., 2012).

Pranayama or yogic breathing provides a powerful tool to voluntarily control breathing patterns and thus influence the autonomic nervous system stress response and emotional state (Brown & Gerbarg, 2005). Yogic breathing has shown to have an effect on brain function and physiological parameters, including stimulating parasympathetic nervous system activity and decreasing sympathetic nervous system activity to balance the 'fight or flight' stress response (Brown & Gerbarg, 2005; Campbell & Moore, 2004; Udupa, Madanmohan, & Bhavanani… etal., 2003) (Figure 1). Brown and Gerbarg (2005) describe a state of 'calm alertness' after yogic breathing, precipitated by the release of mood enhancing hormones (including serotonin, dopamine and endorphins) and relaxation of the stress response systems. The different aspects of pranayama including the phase and duration of the breathing cycle, breath volume, use of the mouth, nostrils, constriction of the laryngeal muscles, position of the glottis and postures, may all have different physiological effects (Brown & Gerbarg, 2005).

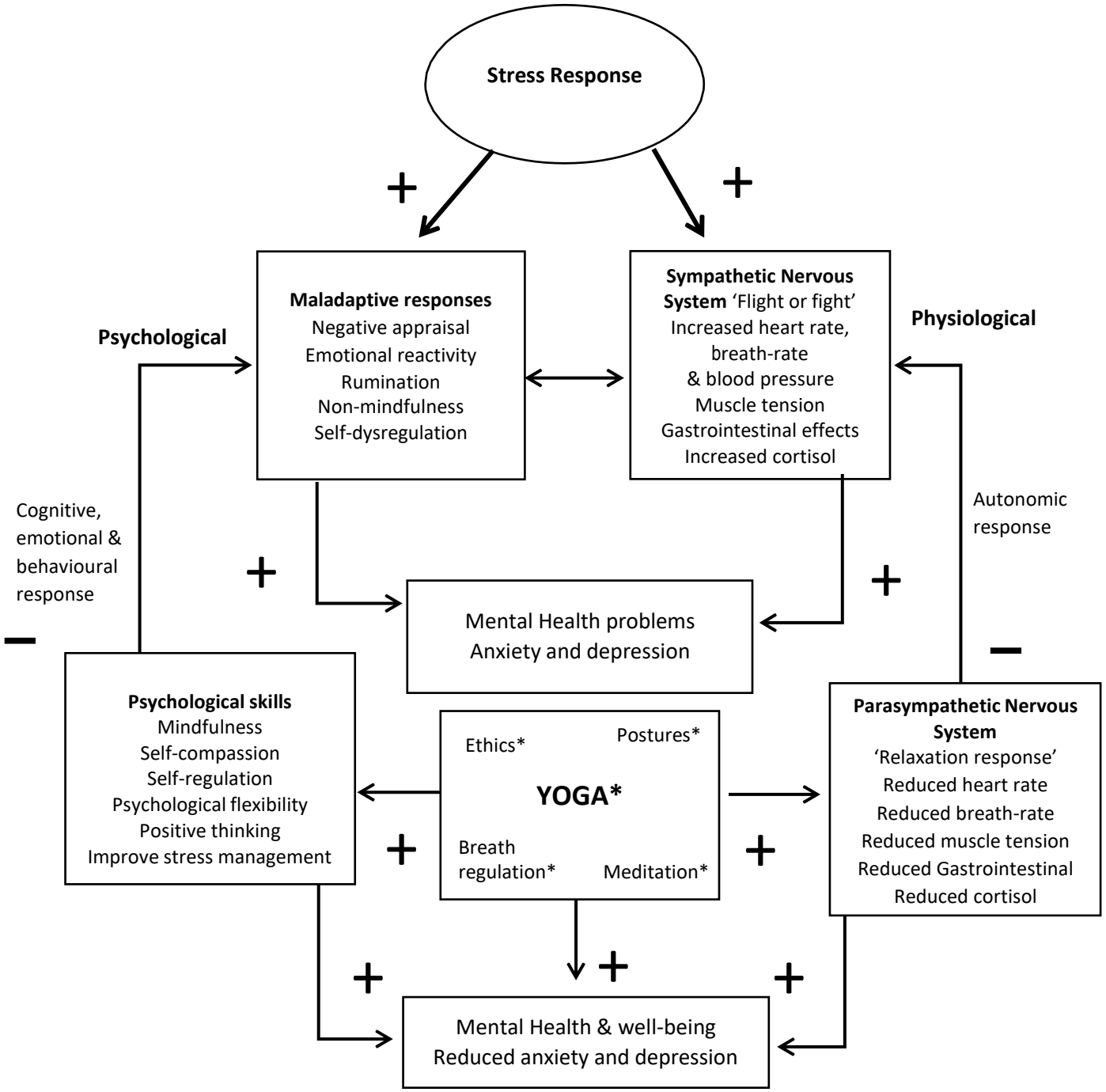

Figure 1. Yoga-mental health model

The model describes the physiological and psychological mechanisms of yoga on the stress response and proposed mental health outcomes. The top half of the model shows the maladaptive responses of the psychological and physiological systems to stress, leading to anxiety and depression. The bottom half of the model shows the proposed influence of yoga on the psychological and physiological systems leading to a reduction anxiety and depression.

*The four main components of Yoga (ethics, breath regulation, postures and meditation) proposed by Gard et al.'s (2012) Self-regulation model of yoga and based on the 8-limbs of yoga are further discussed in Figure 2.

Legend: → = direction of process + = function increases − = function decreases

Yoga postures, breath-work and meditation are all important aspects to consider in the physiological mechanisms of yoga benefits. The combination of postures with deep-breathing and meditation undertaken in yoga practice may be important in counteracting the stress response including re-stimulating digestive processes and increasing blood circulation to the organs (Campbell & Moore, 2004), further reducing the physical symptoms of anxiety and depression (Figure 1). Some forms of yoga are also thought to release mood-boosting dopamine and serotonin (Brown & Gerbarg, 2005; Salmon et al., 2009) and thus may have a more long-term antidepressant effect.

Psychological mechanisms

Psychological mechanisms of yoga, including increased self-awareness (Arora & Bhattacharjee, 2008), coping mechanisms (Kinser et al., 2013b; Rizzolo, Zipp, & Stiskal… et al., 2009), self-regulation (Gard, Brach, & Holzel… et al., 2012), psychological flexibility (Dick, Niles, & Street… et al., 2014), a positive attitude toward stress (Woodyard, 2011), calmness (Sherman, Wemmnan, & Cook… et al., 2013), spirituality (Evans, Cousins, & Tsao… et al., 2011), compassion and mindfulness (Chiesa & Serretti, 2009; Evans et al., 2011), have all been proposed as mechanisms for mental health benefits (Figure 1).

Neuroplasticity, changes in neural pathways of the brain, are thought to occur through regular yoga practice (Brown & Gerbarg, 2005) and influence development and improvement in these psychological skills. This is a powerful connection suggesting that the brain, including thinking patterns and ability to cope with stress, can be trained and rewired much like a physical muscle of the body. In addition, yoga is thought to have a positive effect on brainwave activity by stimulating the activation of alpha, beta and theta brainwaves, which have been associated with improvements in cognition, memory, mood and anxiety (Desai, Tailor, & Bhatt, 2015).

Yoga and mindfulness

Mindfulness interventions are growing in popularity for a range of mental and physical health conditions in a variety of health care settings (Baer, Lykins, & Peters, 2012; Salmon et al., 2009) Mindfulness interventions are thought to work by reducing negative rumination, encouraging a non-judgemental approach to self and others and promoting positive thinking. Several psychological processes of mindfulness, including improvement in mindfulness awareness, thought diffusion, exposure, acceptance, attentional control, memory, values clarification and self-regulation, have been proposed as potential mediators of positive psychological effects that may be achieved through mindfulness interventions (Baer et al., 2012).

Mindfulness-based Stress Reduction (MBSR) and Mindfulness-based Cognitive Therapy (MBCT) are well established structured group programs which have demonstrated positive outcomes for stress, anxiety (da Silva et al., 2009; Kabat-Zinn, 1990) and depression (Baer, 2003; Davis & Hayes, 2011; Kabat-Zinn, 1990). However, the potential of other less structured and movement mindfulness-based interventions, such as yoga on mental health outcomes has not been well researched.

Mindfulness is often considered the 'active ingredient' in yoga and linked to reported positive effects on anxiety and depression (Brisbon & Lowery, 2011; Knight et al., 2014; Salmon et al., 2009). Yoga is often referred to as 'mindfulness in motion' (Salmon et al., 2009) and some preliminary research has suggested that yoga may increase mindfulness (Conboy et al., 2010; Shelov et al., 2009). Shelov et al., (2009) reported improved overall mindfulness measured by the Frieburg Mindfulness Inventory after an 8-week yoga course. Similarly, Brisbon and Lowery (2011) found a positive correlation between yoga participant experience and levels of

mindfulness and reduced stress in a study comparing beginner to advanced yoga participants. Conclusions were that more thorough research is needed to examine the effect of yoga practice characteristics (e.g., consistency and years of practice) on mindfulness levels. The role of mindfulness as a mediator on the positive effects of yoga on depression and anxiety warrants investigation.

Several authors suggest that the movement aspect of yoga may simulate cognitive processes related to mindfulness and may be a more appealing activity for focusing attention than seated meditation due to the increased sensory awareness experienced with movement (Dick et al., 2014; Salmon et al., 2009).

Yoga and self-compassion

Self-compassion is a growing field of research in psychological well-being and is often measured in combination with measures of mindfulness. Neff (2003, p.89) describes self-compassion as 'a healthy attitude toward oneself', including the three main components of kindness, common humanity and mindfulness. Self-compassion is thought to promote an emotionally positive self-attitude that may protect against negative consequences of self-judgement, isolation and rumination, which may lead to depression (Neff, 2003).

There is much debate in psychological fields about the mediating roles of mindfulness and self-compassion on psychological health. Some research has shown that both mindfulness and self-compassion act as mediators of the positive effect of MBCT on depressive symptoms (Baer et al., 2012; Kuyken, Watkins, & Holden… et al., 2010). Neff (2003) suggests a reciprocal relationship between mindfulness and self-compassion, whereby they facilitate and enhance each other, suggesting both are important measures. However, some emerging research

indicates that self-compassion may be a stronger predictor than mindfulness of symptoms of anxiety and depression (Van Dam, Sheppard, & Forsyth… et al., 2011). Many of the reported beneficial effects of self-compassion have emerged from mindfulness programs when not directly addressed; this suggests self-compassion may be a powerful indicator of well-being in its own right and warrants further investigation.

Self-compassion is a significant contributor to positive mental health outcomes reported for anxiety and depression in structured mindfulness-based programs (Baer et al., 2012; Van Dam et al., 2011); however few studies have examined the relationship between yoga and self-compassion. An uncontrolled pilot study of highly experienced yoga practitioners reported changes only in the mindfulness sub-scale of the self-compassion scale with yoga practice (Conboy et al., 2010). Gard et al., (2012) reported improved scores on all aspects of self-compassion except common humanity, as well as increased total self-compassion, comparing pre- and post-intervention results of a yoga-based program with young adults. Self-compassion was also reported to mediate quality of life and decreased perceived stress. Self-compassion and yoga is an exciting area for future research as self-compassion continues to emerge in the field of mindfulness research.

Yoga and self-regulation

A growing body of evidence considers yoga to be a tool for self-regulation, with specific components thought to affect cognition, emotional, behavioural and autonomic systems and long-term psychological health, including the ability to manage stress and utilise coping strategies (Dick et al., 2014; Gard et al., 2012; Salmon et al., 2009). Mindfulness and self-compassion are likely to play an important central role in the self-regulation theory of yoga.

A self-regulation model developed through the eight limbs of yoga has been proposed by Gard et al., (2012), with the four broad categories of ethics, postures, breath regulation and meditation (Figure 2.). These components are thought to facilitate self-regulation of cognition, emotion and behaviour through a bio-directional feedback system of the moral, behavioural and physiological mechanisms (Gard et al., 2012) (Figure 2).

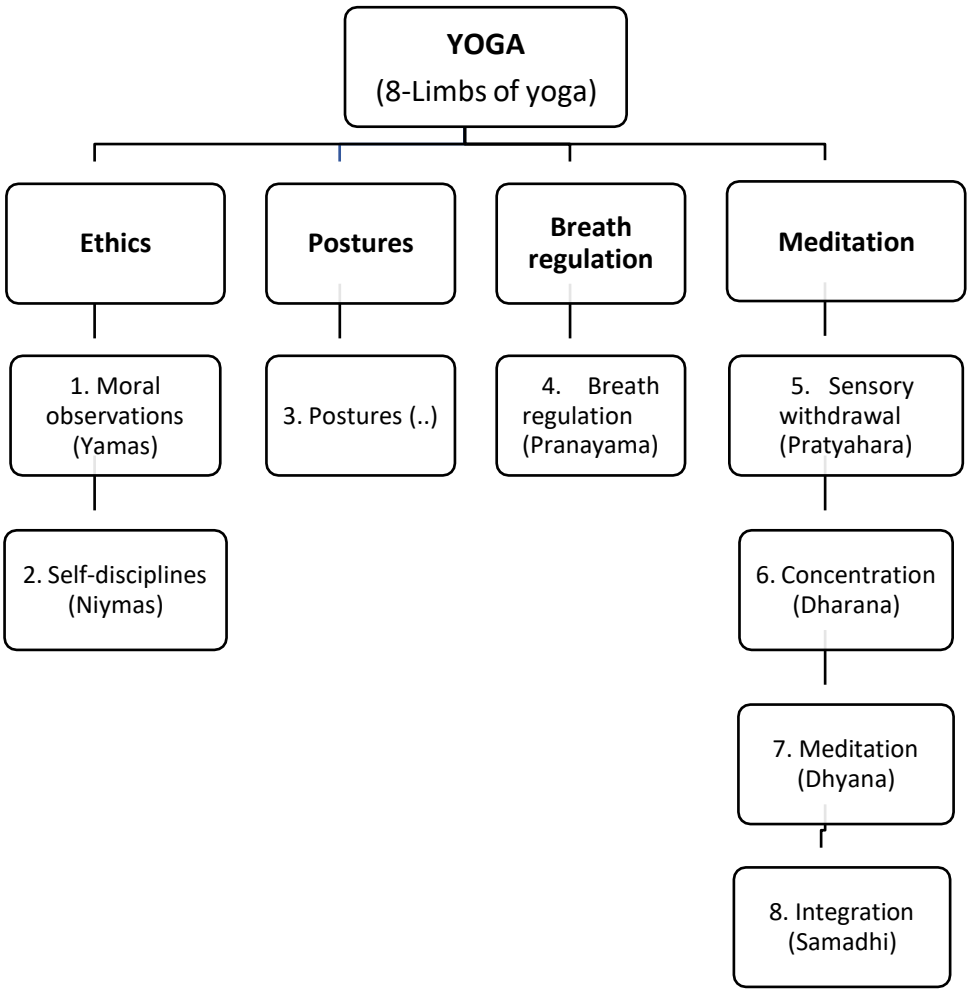

Figure 2. Yoga self-regulation model based on the eight-limbs of yoga (Adapted from Gard et al., 2012)

Yoga and mental health research

A search of the literature yielded limited published yoga and mental health research for anxiety and depression. Effects of yoga on depression have dominated the research field. In a systematic review on the effectiveness of yoga for the treatment of depression Pilkington et al. (2005) identified yoga as a potential beneficial intervention, based on five randomised controlled trials. However, the use of different yoga interventions including, Sudarshan Kriya Yoga, Iyengar- and yoga-based relaxation and breathing techniques, and poor reporting of compliance and attrition rates were significant limitations. Similarly, a systematic review undertaken by da Silva et al., (2009) found Sudarshan Kriya Yoga (based on specific breathing techniques), followed by Iyengar (alignment and prop-focused yoga) and Hatha yoga (general yoga class) as the most effective forms of yoga for major depressive disorders. More recently, Cramer et al., (2013) reported limited-moderate evidence for yoga in producing short-term improvements in depression and anxiety compared to with usual treatment, relaxation, or aerobic exercise in a meta-analysis of 12 RCTs. However, they regarded these findings as promising and concluded that further high-quality research is needed.

Yoga interventions specifically for anxiety disorders have been even less researched. Kirkwood, Rampes, & Tuffrey… et al., (2005) examined eight studies in a systematic review of yoga for anxiety and found positive results. However, findings were limited by the large variation in yoga styles and anxiety conditions (obsessive compulsive disorder, snake phobia and general anxiety) as well as methodological weaknesses, including poor quality and/or reporting of methodology, poor quality or unclear randomisation and low attrition rate. More recently, da Silva et al., (2009) undertook a systematic review and found very limited research on yoga and anxiety in the literature. Findings of the eight studies examined were positive, but again as yoga styles were often unspecified, and research based on old classification schemes

of psychoneurosis or anxiety neurosis, the reliability of findings were justifiably questioned by the researchers. Some more recent small scale pilot studies have found promising results for yoga as an adjunct treatment for improving anxiety symptoms in people with generalised anxiety disorders over time (Katzman, Vermain, & Gerbarg, 2012; Khalsa, Greiner-Feers, Hoffman… et al., 2015). Findings indicate that the evidence for the effectiveness of yoga in managing and preventing anxiety is inconclusive and further rigorous research is needed.

In 2006 the 'Yoga in Australia Survey' was undertaken to examine the characteristics and practice of yoga students and teachers throughout Australia (Penman, Cohen & Stevens… et al., 2012). The survey found that although most people start yoga practice for health and fitness benefits, many continue for stress management. Furthermore, more people practise yoga for mental health rather than physical health conditions, suggesting that mental health may be the main health-related motivator for yoga practice (Penman et al., 2012). Findings of the 'Yoga in Australia Survey' and a review of the literature above provide a promising bench-mark for exploring future yoga and mental health research, and the implications for health care professionals.

Current research limitations

Yoga research has been limited by the nature and wide variation of yoga practice, yoga styles and teaching methods (de Manincor et al., 2015; Sherman, 2012; Varambally & Gangadhar, 2012). Methodological problems in published yoga research include variations in yoga styles and teaching methods, difficulties in double-blinding and finding a suitable placebo-control; lack of random controlled trials, small sample sizes and maintaining attrition rates (Field, 2011; Varambally & Gangadhar, 2012). The literature highlights that there is a lack of consensus on

an appropriate model of how yoga may improve mental health, and the need for more high-quality research.

Yoga research has been challenged by the rigorous requirements of research, most likely due to the highly variable and personal nature of yoga practice (Gangadhar, 2014). Randomised controlled trials are the highest standard of intervention research but are particularly challenging for yoga given the inability to blind participants to the intervention, small size of yoga classes and difficulty controlling variables. Yoga research to date has been limited by methodological inadequacies, including lack of randomisation, small sample sizes, low attrition rates, poor reporting of methodology, lack of blinding, absence of appropriate controls and large variation in yoga styles and teaching methods (De Manincor et al., 2015; Salmon et al., 2009; Sherman, 2012).

Yoga research design issues, including difficulties with adhering to the rigours of research due to the nature of yoga practice, has been a significant barrier. Sherman (2012) emphasises the need to carefully research the yoga style, components and teaching method appropriate to the health condition being examined when designing a yoga research intervention. Previous yoga experience and frequency of practice has also been highlighted in the literature as important factors to consider in developing yoga interventions, to ensure consistency across participants and control groups (Brisbon & Lowery, 2011; Ross, Freidman, Bevans… et al., 2012). Sherman's (2012) framework for designing yoga treatment protocols is a promising bench-mark for future yoga research and application to mental health. This paper may further contribute to a greater understanding of a yoga model for mental health and the role of health care professionals.

The development of a research protocol for yoga is difficult as this is often deemed by yoga practitioners to be inconsistent with the personal and experiential nature of yoga. Sherman (2012) proposed a set of guidelines for developing treatment protocols for yoga trials based on a systematic yet flexible framework that addresses eight characteristics which are listed below:

1. style of yoga;
2. dose and delivery of yoga;
3. components of the yoga intervention;
4. specific class sequences;
5. modifications;
6. selection of yoga teachers;
7. home practice; and
8. long-term follow up.

Sherman (2012) acknowledged that more specific treatment protocols for yoga remain a challenge and suggested alternative methods including using a combination of yoga theory, literature reviews, consultation with senior teachers, use of a formal Delphi process and practical aspects may be more appropriate.

Potential adverse effects of yoga for people with anxiety and depression have not been identified in the literature, but do need to be considered. Specific practices such as rapid breathing exercises, visualisations, extended meditation or advanced postures may increase the risk of symptom exacerbation, psychological or emotional distress, physical injury and/or increased drop-out rate (Uebelacker & Broughton, 2016). Yoga practices need to be tailored to

individuals with anxiety and depression, and class style and components carefully considered through the methods detailed above.

Implications for mental health professionals

Mental health professionals of all disciplines play an important role in advocating and reducing the stigma of complementary and alternative therapies such as yoga in the mainstream health care system. Anxiety and depression are common mental health conditions experienced by people in a variety of health care settings (Brown & Gerbarg, 2005; Louie, 2014) and complementary and alternative therapies are becoming more popular. However, the literature suggests that often people do not disclose their alternative health practices to health care professionals, due to fear of stigma, and belief that they may have a lack of interest, understanding, or a negative attitude towards these practices (Louie, 2014). The development of the therapeutic relationship is central to reducing this stigma and promoting all the potential treatment options for consumers.

Nurses in particular are highlighted in the literature as integral in supporting consumers to adopt, maintain and incorporate yoga and mindfulness-based therapies into their life (Brown & Gerbarg, 2005; Louie, 2014). Yoga, similar to the nursing model of care, is based on a holistic system of health which considers all components of an individual's physical, mental, emotional and spiritual well-being. The eight limbs of yoga provide a model which considers all these areas of health through integrating ethics, postures, breath work and meditation (Gard et al., 2012; Kinser, Bourguignon, Taylor et al., 2013b). The holistic model of yoga and mental health care is relevant to all disciplines and a range of health care settings.

Professionally, yoga-based therapies are a promising new role for mental health professionals to enhance their practice and lead a new initiative in evidence-based consumer-centred care. Brown and Gerbarg (2005) further suggest that clinicians require personal knowledge and practice of yoga techniques in order to make appropriate referrals, support consumer daily practice and integrate yoga into their overall treatment. This paper provides promising scope for yoga as a therapeutic intervention for anxiety and depression and the importance of health care professionals in supporting, promoting and advocating for consumers to utilise alternative therapies.

Summary and future research

There is growing research evidence supporting the use of yoga as an adjunct or combination therapy for the management of stress, anxiety (Kirkwood et al., 2005; Penman et al., 2012) and depression (da Silva et al., 2009; Field, 2011; Penman, 2008; Penman et al., 2012; Salmon et al., 2009). Yoga-based mindfulness interventions are a promising field of research that may provide a cost-effective prevention and long-term self-management adjunct or combination treatment option for anxiety and depression.

Mental health professionals of all disciplines may play an important role in challenging stigma and implementing yoga-based interventions into the mainstream health care system. Yoga and nursing principles are particularly aligned as both are based on a holistic system of health, which considers all aspects of an individual's physical, mental and spiritual health (Gard et al., 2012; Kinser et al., 2013b). However, the yoga model of health is relevant to all disciplines and a range of health care settings.

Yoga research has been challenged by the rigorous requirements of research, including randomisation, blinding and appropriate controls (Gangadhar, 2014). The nature of yoga practice and wide variation in yoga styles, class components and teaching methods makes standard research design problematic and often inconsistent with yoga philosophy (de Manincor et al., 2015; Salmon et al., 2009; Sherman, 2012). Further high-quality researchis needed to establish whether yoga is an effective therapeutic intervention for enhancing mindfulness and self-compassion and the potential relationship to mental health outcomes. Establishing the research design that minimises variables and has the most therapeutic benefit for the study population is the challenge. Evidence-based practice and research is essential to all mental health professions, and in guiding future clinical practice and consumer outcomes. The development of a yoga model for mental health is an exciting new initiative for mental health practice and service delivery.

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CHAPTER 3. Literature Review (Updated)

Introduction

This chapter provides an update on the 2017 literature review presented in Chapter 2 Butterfield, Schultz, Rasmussen and Proeve (2017). The aim of the literature review was to examine the role of yoga in the management of anxiety and depression, development of mindfulness and self-compassion and implications for mental health professionals, with a specific focus on nursing practice. The updated literature search identified 430 articles on research into yoga for anxiety and depression published since 2016, 10 of which informed the aim of the literature review and were included in the update.

Methods

Generally, the methods used in this updated literature review reflected those of the 2017 review. An electronic literature search was undertaken using SCOPUS, CINAHL, PubMed and Web of Science databases for articles from 2016-2021. The same search terms as for Butterfield et al., (2017) were used, including: yoga and mindfulness and/or self-compassion and mental health and/or mental health nursing; yoga and anxiety and/or depression. The search was limited to articles in English and research involving adults with anxiety and/or depression. Articles which focused on yoga in relation to specific comorbidities, pregnancy/prenatal yoga, physical health conditions or other specific conditions or populations were excluded by screening the titles and abstracts. After screening, 10 articles of the 430 retrieved by the search were included in the update. The findings from the 10 new articles are summarised below, grouped according to the same structure as the 2017 review. There were five systematic reviews and five randomised controlled trials.

Yoga potential mechanisms of change for anxiety and depression (0 new articles)

There were no new articles on yoga potential mechanisms of change for anxiety and depression**.**

Yoga and mental health research (10 new articles)

Yoga for depression and anxiety research is of growing interest with articles published in a wide variety of clinical and non-clinical populations. Depression research continues to dominate the field with yoga and anxiety research less common. Since 2016 there have been two systematic reviews on yoga for depression (Brinsley, Schuch, Lederman… et al., 2020; Cramer et al., 2017), one for yoga and mood and anxiety disorders (Vollbehr, Barteld-Velthuis, & Nauta… et al., 2018), and two systematic reviews on yoga for anxiety (Cramer et al., 2018; Zoogman, Goldberg, Vousoura… et al., 2019), but methodological issues and limited numbers of high quality randomised controlled trials remain problematic. There were five systematic reviews and five new RCTs included in the search results.

Major depressive disorder (MDD) is a focus of most of the yoga and depression research. Cramer et al.'s (2017) systematic review of yoga for MDD, included seven RCTs. They reported some evidence for positive effects of yoga on major depression, but the small number of studies found, and methodological issues were limitations. The authors concluded that further high-quality research is needed. Three of the seven included studies were published after 2015, and only one (Schuver and Lewis, 2016) met the criteria to be included in this review.

Schuver and Lewis (2016) examined the efficacy of a mindfulness-based yoga intervention for the reduction of depression symptoms among adult women. Participants with a history of depression and at least existing mild-moderate major depression (Beck Depression Inventory

score >14) were recruited from the community. They undertook a pilot RCT which involved a home-based yoga intervention (n=20) and walking control group (n=20). While both groups had a reduction in depression symptoms the yoga group had significantly lower levels of rumination (*f* (1,31)=6.23, *P*<0.01, Cohen's d effect size=0.55). These findings speak of the benefits of exercise in general for depression but may also indicate additional benefits of yoga in developing specific skills to reduce negative thinking and rumination.

In another study, Uebelacker, Tremont, Epstein-Lubow… et al., (2017) investigated whether yoga was effective as an adjunct treatment with antidepressant medication for participants with major depression. They undertook an RCT with a 10-week yoga intervention (n=63) and a health education control group (n=59). Participants were recruited from the community, based on a diagnosis of major depression in the last two years and current elevated depression levels assessed by the Quick Inventory of Depression Symptomatology. There was no difference in depression symptoms between the two groups immediately post intervention (mean difference -0.78; *p*=0.36; Cohen's d effect size=0.29)**,** but the yoga group had lower levels of depression at the 6-month follow up (mean difference -1.42 (95% CI: -2.42, -0.43); *p*=0.01; Cohen's d effect size=0.50), suggesting that benefits may accumulate over time.

Two other studies on major depression reported a significant improvement in depression levels after a yoga intervention. In 2017, Pranthikanti et al., (2017) undertook a pilot RCT to investigate the potential mood benefits of hatha yoga for people diagnosed with mild-moderate major depression using the Beck Depression Inventory and a psychiatric interview. There were 20 participants in the intervention group and 18 in the control group, which involved 'attention control' education. Participants were recruited via the general community. Findings showed a greater improvement in depression severity in the yoga intervention group compared to the

control group over the 8-weeks (Yoga group -9.47 mean difference; control group -1.70 mean difference; (95% CI: -1.81, -0.12); *P*=0.020, Cohen's d effect size=-0.96). Similarly, Tolahunase et al., 2018 reported positive findings with an RCT on yoga and meditation for MDD in a clinical setting. Participants were recruited from a Psychiatric outpatient department in New Delhi, and were required to have a diagnosis of MDD and Beck Depression Inventory score >45. There was a significant decrease in depression scores pre- to post- for the 12-week yoga (mean=23.17, 17.34 (-5.83 difference), n=29) and meditation intervention (mean=22.21, 23.66 (1.45 difference), n=29). Both studies, although using different controls and non-clinical versus clinical settings, showed evidence for the benefits of yoga for major depression.

Other research has reported positive benefits of yoga for mild-severe depression symptoms. De Manincor et al., (2016) was the only study which examined effects of yoga on depression as well as anxiety. They investigated the effectiveness of a 6-week individualised yoga intervention (n=47) on the reduction of symptoms of anxiety and depression, compared to waitlist control (n=54). Participants were recruited from the community via newspaper advertisements and social media, and referrals from psychologists, general medical practitioners and mental health services. Eligibility criteria included Depression, Anxiety and Stress Scale (DASS) scores indicating at least mild anxiety and/or depression although moderate and severe cases were also included. Findings suggested that the yoga intervention plus regular care was effective in the reduction of symptoms of depression compared to regular care alone (mean DASS score of 11.87 and 16.26, respectively and a difference of -4.30 (95% CI: -7.7, -0.91); *P*=0.01, Cohen's d effect size= -0.44). However, they found nodifference in anxiety symptoms in the yoga intervention group (mean 9.26) compared to waitlist control (mean 12.56) (difference of -1.91 (95% CI: -4.58, 0.76); *P*=0.16; Cohen's d effect size=-0.35) and concluded that the effect of yoga on anxiety needs further research.

Yoga for depression in people with a mental health condition is a growing area of research. Brinsley et al., (2020) undertook a systematic review and meta-analysis on the effects of yoga on depressive symptoms in people with mental disorders. The criteria for 'mental disorder' were broad and included depression, post-traumatic stress disorder, schizophrenia, anxiety, alcohol dependence and bipolar disorder. Nineteen studies were included, with 13 included in the meta-analysis. Yoga showed greater reduction in depressive symptoms than waitlist control, treatment as usual and attention control. However, limitations of studies included different protocols, lack of intervention descriptions, poor-quality methodology and poor reporting of retention rate. The authors concluded that more high-quality studies with adequatesample sizes and standardised protocols are required. Nine of the studies were undertaken since2015, two of which met the criteria and are included in this updated literature review (Prathikanti et al., 2017; Uebelacker et al., 2017).

Yoga for anxiety has been less researched than for depression. Cramer et al., (2018) undertook another systematic review of yoga for anxiety and included eight RCTs. Findings suggested that yoga may be beneficial for people with elevated anxiety levels but inconclusive for those with a formal anxiety diagnosis. Limitations included the small number of studies and methodological issues. Only two of the studies included in this review were since 2016, and only one met the search criteria (de Manincor et al., 2016) and is included in this literature review. As discussed earlier, de Manincor et al., (2016) found no difference in anxiety symptoms in the yoga intervention group compared to waitlists control (Mean=9.26, 12.56 (-1.91 difference); (95% CI: -4.58, 0.76); *P*=0.16; Cohen's d effect size=-0.35) and concluded that the effect of yoga on anxiety needs further research. Similarly, Vollbehr et al., (2018) undertook a systematic review and meta-analysis of hatha yoga for mood and/or anxiety disorders and included 18 studies. The author acknowledged that the studies were mostly of

low quality with methodological issues identified and reported inconclusive findings. Eight of these studies were published since 2016, four met the search criteria and were included in this literature review (Schuver and Lewis 2016; Uebelacker et al., 2017; Prathikanti et al., 2017; & Tolahussanae et al., 2018). Cramer et al., (2018), de Manincor et al., (2016) and Vollbehr et al., (2018) all reported that further high-quality research on yoga for anxiety is needed.

Zoogman et al., (2019) also undertook a systematic review of yoga for anxiety symptoms and included 38 RCTs with a broad range of criteria (included various medical diagnoses, differing psychological criteria, pregnant women, community and clinical samples). They reported that yoga significantly reduces anxiety symptoms, however due to the diverse range of medical diagnoses and psychological criteria, study protocols, controls, and unclear amounts of yoga, further extrapolation of their findings is difficult. Furthermore, none of the included studies were undertaken since 2016 and are therefore not included in this updated review.

Recently, there have been some promising findings. Simon, Hofmann, and Rosenfield et al. (2021) undertook a randomised controlled trial to assess whether kundalini yoga (n=93) and cognitive behaviour therapy (CBT) (n=90) for generalised anxiety disorder are both more effective than a control group of stress education (n=43). The three interventions were delivered to groups of 4-6 participants over 12 x 120 minute sessions with 20 minutes of daily homework. Participants were recruited from two speciality academic centres and required a diagnosis of general anxiety disorder, which was determined by structured clinical interviews using the DSM-5 criteria. The Clinical Global Impression-Improvement Scale score was measured prior to the intervention, then fortnightly during the intervention and at 6-month follow up. Findings showed that yoga and CBT were both more effective than the control in reducing anxiety, but CBT was also more effective than yoga. Limitations included the that the rigorous procedures required in this study may not have reflected the delivery of yoga and CBT in the community,

and findings may not apply to all yoga types with the focus on Kundalini yoga in this study. However, these results are promising and indicate that yoga may have a role in anxiety management into the future.

Current research limitations

Research into yoga for anxiety and depression is increasing but comparing and analysing findings is difficult due to the wide variation in characteristics of yoga interventions, severity of anxiety and depression symptoms, types of control groups and measures used. Furthermore, there are few high quality randomised controlled trials on yoga for depression and anxiety.

Implications for mental health professionals

Nurses and other mental health professionals are in an ideal position to advocate and support consumers wishing to explore yoga as part of their treatment. However, for yoga to be more accepted as a treatment modality, further high-quality research with randomised controlled trials in specific clinical populations is needed.

Summary and future research

Research into yoga for anxiety and depression is growing but further high-quality RCTs are needed. Preliminary research supports the role of yoga as an adjunct treatment for depression, but anxiety has been less well researched. However, it is difficult to derive clear synthesised findings due to the wide variation in the characteristics of the yoga intervention, severity of symptoms, types of control groups and measures used in recent studies.

The potential role of mindfulness and self-compassion skills developed through yoga and its relationship to positive mental health outcomes warrants further investigation. The role of yoga in the treatment of anxiety and depression in clinical populations, and implications for the

mental health care system and health professionals, is an important area for future research.

CHAPTER 4. Methodology

Mixed methods research

Mixed methods research is a research approach that involves collecting, analysing and integrating quantitative and qualitative data in the same study (Bowers, Cohen, & Elliot… et al., 2013; Shorten & Smith, 2017). There has been growth of mixed methods research in nursing and healthcare fields coinciding with increasing complexity in healthcare delivery on a global scale. Mixed methods research allows researchers to explore diverse perspectives and relationships, drawing on the strengths of both qualitative and quantitative methods (Shorten & Smith, 2017). There are six main mixed methods research designs including convergent, explanatory sequential, exploratory sequential, embedded, transformative and multiphase designs (Creswell & Plano Clark, 2018) which are discussed below.

In *convergent* mixed methods studies the quantitative and qualitative results are compared or combined for a complete understanding of the research problem (Figure 3). This design can be useful when there is limited time for data collection and both types of data can be collected at the same time; quantitative and qualitative data is required from all participants and the researcher has skills in both types of research methods (Creswell & Plano Clark, 2018). Strengths of this design include that it is an efficient design with both types of data collected at the same time, and each type of data can be collected and analysed independently. Challenges include that a great deal of work and expertise is required, and there is difficulty in merging and meaningfully interpreting different data (Creswell & Plano Clark, 2018).

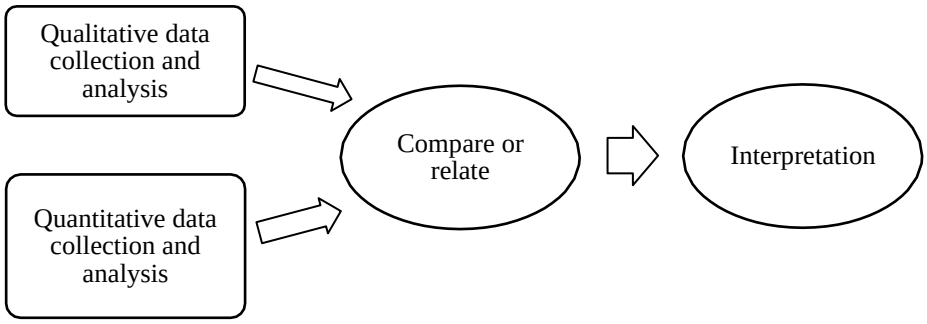

Figure 3. Convergent mixed method design

The *explanatory sequential* mixed methods design starts with collection and analysis of quantitative data followed by qualitative data, which is used to explain or expand on quantitative results (Figure 4). This design is often used when the researcher/s and research problem are more quantitatively focused, researchers have the time and ability to collect a second round of qualitative data from participants, but have limited resources (Creswell & Plano Clark, 2018). This design often appeals to quantitative researchers as the structure is straightforward and manageable for single researchers and the write-up is also simple with a quantitative followed by qualitative section. Challenges include the longer timeframe needed; that the qualitative phase cannot be planned in detail in advance; quantitative results to be followed up on must be identified beforehand, and researchers must decide which participants to sample in the qualitative phase (Creswell & Plano Clark, 2018).

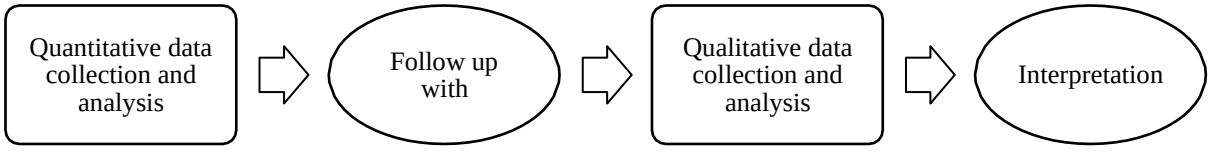

Figure 4. Explanatory sequential mixed method design

The *exploratory sequential* mixed methods design has three phases, starting with the collection and analysis of qualitative data then, building on these results, a quantitative phase is developed, tested and interpreted (Creswell & Plano Clark, 2018) (Figure 5). The aim is to generalise qualitative findings based on a few individuals from the first phase to a larger sample collected during the second phase. This design is useful when the researcher/s and research problems are more qualitatively orientated; the researcher does not know what constructs are important to study, and relevant quantitative tools are not available; there is enough time to conduct research in two phases and limited resources. Strengths of the design include that the separate phases make it more straightforward to describe, implement and report; including a quantitative phase may appeal to quantitative researchers; and allowing a second quantitative phase when the need arises from the qualitative phase. Challenges are that this two-phase approach needs substantial time, it is difficult to specify procedures of the quantitative phase when applying for ethics approval/grants, and there is the potential for bias in the quantitative sample (Creswell & Plano Clark, 2018).

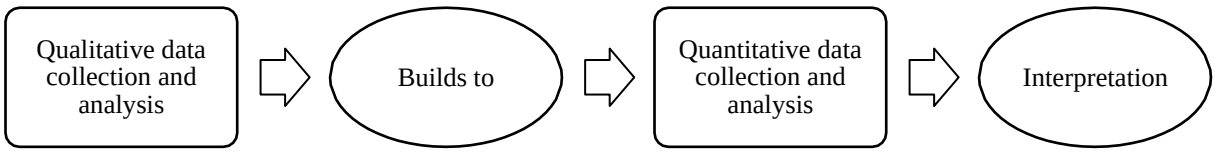

Figure 5. Exploratory sequential mixed method design

The *embedded* mixed methods design involves the collection and analysis of quantitative and qualitative data within a quantitative or qualitative design (Figure 6). The basis of this design is that a single dataset is not adequate and that different types of data are required. This design

is used when the researcher has the relevant expertise to rigorously implement the quantitative and qualitative design; they are comfortable with either a qualitative or quantitative focused study, and do not have the resources to place priority on both types of data. Strengths include: the design can be used when the researcher has limited time or resources, supplemental data can be used, it works well with a team approach, two types of results can be published separately and may appeal more to funding agencies. Challenges include that the researcher: needs expertise in the qualitative or quantitative design as well as mixed methods research; must specify the purpose for collecting qualitative or quantitative data as part of larger study; must decide at what point in the study to collect qualitative data; and it can be difficult to integrate results (Creswell & Plano Clark, 2018).

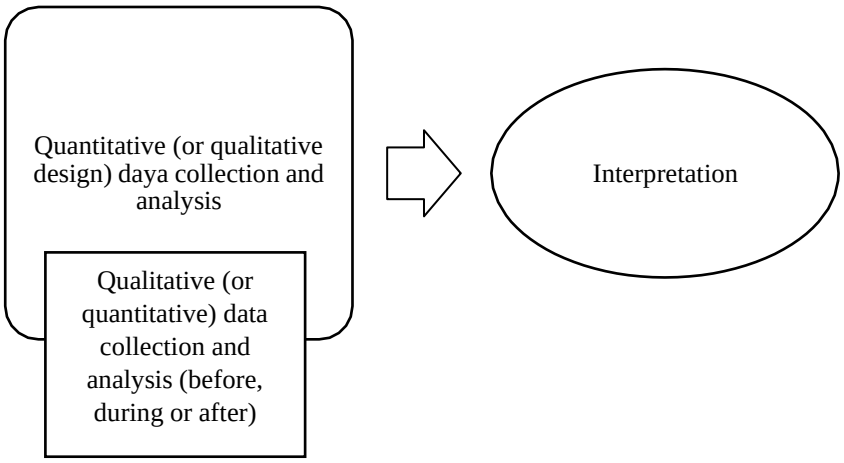

Figure 6. Embedded mixed methods design

The *transformative* design is a mixed method design within a transformative theoretical framework (Figure 7). This design is used to conduct social injustice research. Researchers may implement any of the four previously discussed basic mixed methods designs within their transformative design. The research helps to empower individuals to instigate change, as participants often play an active role in research and the researcher can use a variety of methods. There is minimal literature on implementing transformative mixed methods research.

Additionally, the researcher may need to justify the approach, and must develop trust with participants (Creswell & Plano Clark, 2018).

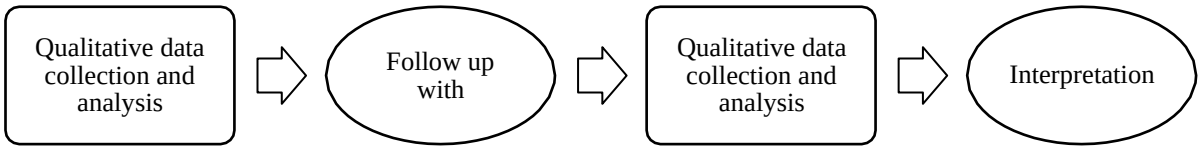

Figure 7. Transformative mixed method design

The *multi-phase* mixed methods design combines sequential and concurrent mixed method designs over a period of time (Figure 8). This design is used to implement multiple phases to address a program objective. The multiphase design is used when the researcher: cannot meet the long-term objective with a single mixed methods study; has experience in large-scale research and adequate resources and funding; is part of a team with both qualitative and quantitative expertise; and is conducting an emerging mixed methods research project with new questions arising during the research project. Strengths include that this design has the flexibility to address a set of interconnected research questions; researchers can publish results from individual studies while also contributing to the overall research project; the design fits the standard program evaluation and development approach; and the researcher can use this design to provide an overall framework for conducting several studies over multiple years. Challenges include that the researcher needs adequate resources to implement several phases over multiple years; they need to effectively collaborate with a research team and consider how to meaningfully connect individual studies as well as combining quantitative and qualitative data; and consider how to turn research findings into practice; and may need to submit new or modified protocols for each phase (Creswell & Plano Clark, 2018).

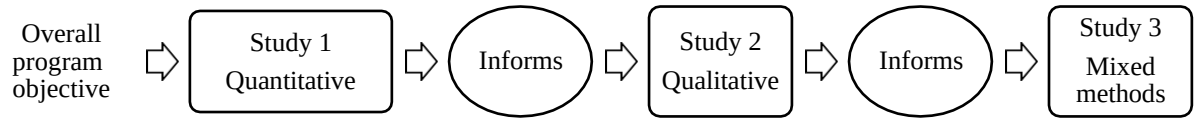

Figure 8. Multi-phase mixed method design

Rationale for multi-phase mixed method research

The multiphase mixed methods research design was chosen for this research project as it required several phases of quantitative and qualitative research to effectively investigate the overall aim. The four phases were interrelated, and each phase provided guidance to the development of the next phase. In the present study, the literature review and model development were first undertaken (Phase 1), quantitative data was then obtained through surveys (Phase 2), built on through qualitative focus groups (Phase 3) and combined to develop the intervention that was tested in Phase 4.

Yoga and mental health research appears to be mostly quantitatively based, so this research project has added an important dynamic, and a more complete understanding with both quantitative and qualitative data collected, analysed and integrated throughout the three phases. The rationale for more quantitative compared to qualitative research appears to be due to the emphasis on more high-quality randomised control trials to demonstrate the effectiveness of yoga and integrate it into clinical care. Many authors emphasise the need to address methodological inadequacies, and for more randomised controlled trials in yoga research, as a way forward (Naupaul, Mischoulon, Uebelacker… et al., 2019; Field, 2016). However, there is the argument that the nature of yoga practice and wide variation in yoga styles and practices makes standard research design problematic and often inconsistent with yoga philosophy

(de Manincor et al., 2015; Salmon et al., 2009; Sherman, 2012). Qualitative research captures the human experience of yoga, and in combination with quantitative research may provide a better understanding of how and why to incorporate yoga into clinical care.

Phase 1

Phase 1 involved a literature review and model development. The literature on potential biological, physiological and psychological mechanisms of change facilitated by yoga for anxiety and depression was reviewed. A yoga mental health model was developed to describe the physiological and psychological mechanisms of yoga on the stress response and proposed mental health outcomes for anxiety and depression.

Phase 2

Phase 2 was a quantitative study which involved surveys sent to South Australian yoga teachers and students. Teacher survey questions included demographic data, yoga background and teaching experience and mindfulness measures. Student survey questions included demographic data, yoga practice characteristics and mindfulness, and mental health measures. The teacher and student surveys were linked by a code. Inferential statistics were used to assess the influence of independent variables (home practice, class length and frequency, meditation and practice experience and teacher characteristics) on dependent variables (mindfulness and mental health measures). Independent sample t-tests were used to compare continuous variables between groups, and compare mindfulness and self-compassion measures between teachers and students. Bivariate Pearson's product-moment co-efficient was calculated to test the size and direction of the relationship between student practice experience and mindfulness and their mental health measures. Linear mixed model analysis was used to examine influence of independent variables identified in the univariate analysis on dependent variables.

Phase 3

Phase 3 was a qualitative study which involved consultation through focus groups with consumers and staff of a mental health service, and interviews with yoga teachers. The feasibility and practicality of designing a yoga intervention for mental health consumers with anxiety and depression was discussed in the focus groups. The focus groups were run by author NS, who had previously worked with some of the consumers and staff, as a mental health nurse. This potential bias was considered as part of the ethics application, and thus recruitment for consumers was undertaken by the care coordinator. All participants were aware of the interviewer's reasons and interests in doing the research.

Themes were developed using Braun and Clarke's (2006) six step process for thematic analysis which involves becoming familiar with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report. The focus group and interview recordings were transcribed verbatim by author NS. Transcripts were read through several times and initial codes generated by author NS. Step three and four involved searching for themes and refining them by authors NS and PR. The essence of the themes were then discussed, finalised and defined with all authors.

Phase 4

Phase 4 involved a randomised controlled trial of a 10-week yoga course with pre- and post-mental health measures and a focus group. A waitlist control group was implemented, and pre- and post- measures were analysed for both intervention and control groups using Wilcoxon Signed Rank non-parametric test. Themes were developed from the focus group using Braun and Clarke's (2006) six step process for thematic analysis, which involves becoming familiar with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report. Recordings were transcribed verbatim by an external

company. Transcripts were read through several times and initial codes generated by author NS, searching for themes and refining them was then undertaken by authors NS and PR. The essence of the themes were then discussed, finalised and defined with all authors.

Challenges

Challenges with developing and implementing this research project included the time and resources needed to complete each phase. As a half-time PhD candidate, the project spanned 8.5 years, partially due to the time commitment required at different phases. Furthermore, one of the main resource limitations was the requirement from the Human Research Ethics Committee to use other mental health staff to manage participant recruitment in Phase 3 and 4.

CHAPTER 5. Mindfulness, self-compassion, anxiety and depression measures in South Australian yoga participants: implications for designing a yoga intervention

Please note: The published article is included as Appendix 2

Statement of authorship

Title of paper:	Mindfulness, self-compassion, anxiety and depression measures in South Australian yoga participants: implications for designing a yoga intervention
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Publication details:	Snaith, N., Schultz, T., Proeve, M., & Rasmussen, P. 2018. Mindfulness, self-compassion, anxiety and depression measures in South Australian yoga participants: implications for designing a yoga intervention. *Complementary Therapies in Clinical Practice*, 32: 92-99

PRINCIPAL AUTHOR

Principal author name:	Nicole Snaith
Contribution to paper:	Developed the research proposal; conducted searches and retrieved papers; conducted all participant interviews; coded, appraised and extracted data; acted as corresponding author; wrote and revised the manuscript based on supervisor and reviewer feedback.
Overall percentage:	85%
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper

28/06/2021

Signed Date

CO-AUTHORS

By signing the Statement of Authorship, each co-author certifies that:

The candidate's stated contribution to the publication is accurate (as stated above)

Permission is granted for the candidate to include the publication in the thesis; and

The sum of all co-author contributions is equal to 100% less the candidate's stated contribution.

Co-author name:	
Contribution to paper:	Dr Tim Schultz Provided guidance, assistance, and critical feedback throughout all steps of this research
Signed	28/06/2021 Date
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Contribution to paper:	Provided guidance, assistance, and critical feedback throughout all steps of this research
Signed	28/06/2021 Date
Co-author name:	Dr Michael Proeve
Contribution to paper:	Provided guidance, assistance, and critical feedback throughout all steps of this research
Signed	28/06/2021 Date

Abstract

Aim: The aim of the study was to examine the demographic and practice characteristics of current yoga participants and assess their levels of mindfulness, self-compassion, stress, anxiety, depression and wellbeing, and implications for designing a yoga intervention.

Methods: A web-based survey was administered to South Australian yoga teachers and students from September 2014 to February 2015.

Results: Results showed a positive correlation with mindfulness and self-compassion and negative correlation with Depression, Anxiety and Stress scores, with months of practice. Mindfulness and self-compassion scores were significantly higher with two or more classes per week and mindfulness higher in those with a regular meditation practice.

Discussion: Key findings indicate that class frequency, practice experience and meditation practice are important factors in designing a yoga intervention examining mindfulness and mental health.

Conclusion: Findings provide important information for guiding development of a yoga intervention for anxiety and depression.

Keywords: Yoga, Mindfulness, Mental health, Anxiety, Depression

Introduction

Anxiety and depression are common mental health problems, increasing in prevalence worldwide and with significant social and economic impact (WHO, 2017). The World Health Organisation reports depression as the leading cause of disability and estimates over 300 million people experience depression and over 264 million experience anxiety globally (WHO, 2017). In Australia, anxiety-related conditions are the most prevalent at 2.6 million (11.2%), followed by mood disorders, including depression, at 2.1 million (9.3%) (Australian Bureau of

Statistics, 2015). Current treatments for depression and anxiety include a range of pharmacological (Swinson, Antony, & Bleau, 2006), psychological (Davis and Hayes, 2011; Hunot, Churchill, Silva De Lima… et al., 2007), lifestyle (Cooney, Dwan, Greig… et al., 2013) and complementary therapies (Jorm & Christensen, 2004), electro-convulsive therapy, and a combination of these interventions (Swinson et al., 2006). However, side effects, effectiveness, cost, accessibility and ethics of invasive treatments are a concern, and long-term benefits of these treatments are little known (de Manincor et al., 2015).

Complementary and alternative therapies are growing in popularity in the management of anxiety and depression (de Manincor et al., 2015). Yoga is increasingly being recognised as an effective adjunct therapy for a range of mental health conditions, including depression (Cramer et al., 2013; da Silva et al., 2009; Pilkington et al., 2005) anxiety (Cramer et al., 2013; Kirkwood et al., 2005; Uebelacker & Broughton, 2016) and stress (Penman, 2008; Varambally & Gangadhar, 2012). Yoga and depression research is promising with a meta-analysis of 12 randomised controlled trials (RCTs) of people with depressive disorders, reporting evidence for short-term improvements in severity of depression with yoga practice (Cramer et al., 2013). The effectiveness of yoga in treating anxiety disorders has been less researched but there are promising findings from small scale studies on the benefits of yoga for reducing anxiety (Brown & Gerbarg, 2005; da Silva, Poscablo, Habousha… et al., 2012; da Silva et al., 2009; Uebelacker & Broughton, 2016). The exact mechanism of yoga mental health benefits is unclear and may be influenced by a combination of factors, including postures, breath-work, meditation, mindfulness and spiritual aspects (da Silva et al., 2009; Field, 2011; Sherman, 2012).

Mindfulness has been indicated as the 'active ingredient' in yoga linked to positive mental health outcomes (Salmon et al., 2009). Mindfulness-based therapies are gaining popularity with structured programs well established in a wide range of health care settings (da Silva et al., 2009; Marchand, 2012). Self-compassion is a growing field of research in psychological well-being and is often measured in combination with mindfulness. Both mindfulness and self-compassion have been shown to act as mediators of the positive effect of Mindfulness- Based Cognitive Therapy on depressive symptoms (Baer et al. 2012; Kuyken, Watkins, Holden… et al., 2010). Neff (2003) proposes a reciprocal relationship between mindfulness and self-compassion, whereby they facilitate and enhance each other, suggesting both are important concepts.

Yoga is a traditional philosophy and practice originating in India over 5,000 years ago (Cramer, Lauche, & Dobos, 2014) and is based on a holistic and comprehensive system of health and well-being. Yoga may be a suitable alternative or adjunct therapy for people with anxiety and depression due to its affordability, accessibility, benefits for general health and well-being and concerns of stigma associated with traditional treatments (WHO, 2017).

The research evidence is promising and indicates an exciting role for yoga in future mental health care. However, further research is needed on the potential role of yoga as a 'movement-based mindfulness' intervention and as an adjunct therapy for anxiety and depression. Therefore, the aim of the study was to examine the personal and practice characteristics and experience of current yoga teachers and students in the community, and assess their levels of mindfulness, self-compassion, stress, anxiety, depression and wellbeing;and use study findings to inform the later design of a yoga intervention.

Objectives

1. Survey yoga teachers and students to measure their teaching characteristics and practice characteristics, respectively, and their levels of mindfulness and self-compassion
2. Test for relationships between home practice, class frequency, class length, meditation and practice experience on levels of mindfulness, self-compassion and mental health outcomes (depression, anxiety, stress and wellbeing)
3. Identify key components for designing a yoga intervention

Methods

Study design

A web-based survey was administered in South Australia to yoga teachers and students from September 2014 to February 2015. The yoga teacher and student surveys were developed through consultation with Yoga Australia, yoga teachers, researchers in the field and existing survey formats, e.g., the Yoga Australia Survey (Penman et al., 2012). Individual teachers were linked to their students via a code.

Yoga teacher survey

The yoga teacher survey included three sections: (1) demographic information, (2) yoga background, and (3) mindfulness measures, including the Five Facet Mindfulness Questionnaire Short Form (FFMQSF) and Self-Compassion Scale Short-Form (SCS-SF) (Appendix 3). It was piloted with interstate yoga teachers not involved in the research project.

Yoga student survey

The Yoga Student Survey (Appendix 4) included four sections as follows:

1. Demographic questions
2. Yoga practice characteristics and experience
3. Mindfulness measures

    3a Five Facet Mindfulness Questionnaire Short Form (FFMQ-SF)

The FFMQ is a 39-item questionnaire that provides sub-scale scores for five elements of mindfulness, including observing, describing, acting with awareness, non-judging of and non-reactivity to the inner experience (Baer et al., 2012). The FFMQ-SF is a shorter 24-item questionnaire (Bohlmeijer, ten Klooster, Fledderus… et al., 2011) that is a reliable and validated tool (Bohlmeijer et al., 2011) shown to be a good indicator of many variables related to mindfulness (Baer et al., 2012). Research has shown that the 'observe' sub-scale of the FFMQ and FFMQ-SF may function differently in populations with meditation experience (Baer, Smith, Lykins… et al., 2008; de Bruin, Topper, Muskens… et al., 2012). The 'observing' sub-scale and self-focused attention is thought to be maladaptive in those without meditation experience, and may increase self-judgment and self-critical responses, whereas people who practise meditation learn to observe and experience all sensations in a more open-minded, mindful and non-judgemental way (Baer et al., 2008; de Bruin et al., 2012). Therefore, the FFMQ-SF, FFMQ-SF (no observe) sub-scale and the observe sub-scale alone were examined in this research project.

3b Self-Compassion Scale Short-Form (SCS-SF)

The Self-Compassion Scale (SCS) is a 26-item questionnaire with six sub-scales assessing self-compassion: self-kindness, self-judgement, common humanity, isolation, mindfulness and over-identification, as well as a total self-compassion, and is established as a valid and reliable

measure of psychological well-being (Baer et al., 2012; Neff 2003; Raes, Pommier, Neff… et al., 2011). The SCS is a 26-item questionnaire. The Self-Compassion Scale Short-Form (SCS-SF) is a shorter 12-item questionnaire which is a reliable and valid alternative to the full SCS (Raes et al., 2011).

4. Mental Health Outcomes

4a Depression, Anxiety and Stress Score 21 (DASS21)

The Depression, Anxiety and Stress Scale 21 (DASS21) has been well validated as an effective tool to measure depression, anxiety and stress levels in a range of clinical (Antony, Bieling, Cox… et al., 1998) and non-clinical populations (Henry & Crawford, 2005).

4b Mental Health Continuum-Short Form (MHC-SF)

The Mental Health Continuum-Short Form (MHC-SF) is a 14-item questionnaire and considered a reliable and valid measure of mental wellbeing (Keyes, Shimotkin, & Ruff, 2002; Lamers, Westerhof, Bohlmeijer… et al., 2011). The MHC is based on the notion that mental health is not just the absence of mental illness, but also the presence of emotional, psychological and social wellbeing (Lamers et al., 2011).

The yoga student survey was piloted with interstate and South Australian yoga students and teachers who were not involved in the research project.

Participant recruitment

Yoga Australia (YA) and the Yoga Teachers Institute of South Australia (YTISA) supported recruitment by emailing information about the project to 40 registered yoga teachers. Yoga teachers who were interested then contacted the researcher to complete the online survey. Three

reminder emails were sent to all registered YA and YTISA yoga teachers in the state. Yoga teachers distributed the yoga student online or hard copy survey to their students and provided three reminders to students.

Data analysis

Data was analysed using the SPSS statistical program. Descriptive statistics were used to describe and summarise the data. Inferential statistics were used to assess the influence of independent variables (home practice, class length, class frequency, meditation and practice experience) on dependent variables (FFMQ-SF, SCS-SF, DASS21 and MHC-SF scores). Independent sample t-tests were used to compare continuous variables (FFMQ-SF, SCS-SF, DASS21 and MHC-SF) between groups based on home practice, class frequency, class length and meditation. The Bivariate Pearson's product-moment co-efficient (r) was calculated to assess the size and direction of the relationship between practice experience and FFMQ-SF, SCS-SF, DASS21 and MHC-SF scores. Independent samples t-test was used to compare student to teacher FFMQ-SF and SCS-SF scores. Linear mixed model analysis was undertaken to examine the influence of independent variables identified in the univariate analysis with the dependent variables (FFMQ-SF, SCS-SF, DASS21 and MHC-SF). Effect sizes were based on Cohen's d (1988) as follows, 0.20 (small), 0.50 (medium) and 0.80 (large) and in a correlation, 0.10 (small), 0.30 (medium) and 0.50 (large) (Cohen, 1988).

Ethics approval

Ethics approval was obtained from the University of Adelaide Human Research Ethics Committee (Appendix 5).

Results

Yoga teachers

Twenty-four (60%) of the 40 registered South Australian yoga teachers who responded to the initial email completed surveys, and 17 of these yoga teachers (71%) distributed the yoga student surveys to their classes. Ninety two percent (n = 22) of yoga teachers were female and over 60% were aged 35–54.

In this survey, most yoga teachers were qualified at level one (42%), equivalent to 350 hours of training and three years teaching experience, and over two thirds were registered with the Yoga Institute of South Australia and Yoga Australia. Yoga teacher's practice experience ranged from 8 to 41 years with an average of 24.3 years, and teaching experience ranged from 1 to 45 years with an average of 12.4 years.

Yoga teachers predominantly taught 1–3 classes per week (54%) and Hatha yoga was the most common style (84%). All classes included postures, breath-work and meditation; other components included music (71%), spiritual teachings (50%), chanting (33%) and use of candles or incense (29%). All yoga teachers identified health and fitness and spiritual reasons as motivation for their practice, 88% also identified stress management, 63% to reduce or manage anxiety and 46% to reduce or manage depression.

Yoga students

One hundred and eighty-one yoga students completed the yoga student surveys out of a possible 378, giving a response rate of 48%. There were 166 (92%) female and 15 (8%) male respondents, two-thirds were aged over 35 and over fifty percent (n = 93) had a University education and were employed.

Yoga practice experience ranged from one month to 50 years with an average of 8.84 years. Seventy-five percent (n = 135) of students practiced hatha yoga and most classes included postures, breath-work, meditation and music (Table 1). Seventy-two percent (n = 130) of yoga students practiced yoga at home in addition to attending yoga classes, with the main home practices of gentle hatha (n = 52) and practice of specific postures (n = 32). Seventy-seven percent (n = 140) of students practiced yoga once a week and 68% (n = 129) practiced a 60-90-min class. Meditation practice, in addition to yoga practice, was undertaken by 28% (n = 50) of yoga students. Ninety four percent of students practiced yoga for health and fitness benefits, 62% for spiritual aspects, 56% for stress management, 43% to reduce and/or manage anxiety and 20% to reduce and/or manage depression (Table 1).

Table 1. Yoga student practice characteristics

Variable		n	Percentage
Yoga style	Hatha	135	74.6
	Vinyasa	23	12.7
	Iyengar	9	5.0
	Dru	5	2.8
	Bikram	1	0.6
	Other	3	1.7
Home practice	No	51	28
	Yes	130	72
**Class frequency	Once a week	140	77
	2 or more classes per week	28	16
**Class length	30-60 min	30	16.6
	60-90 min	129	68.0
Meditation	No	131	72
	Yes	50	28
Why practise yoga? *	Health & fitness	170	94
	Spiritual	112	62
	Stress Management	101	56
	Anxiety	78	43
	Depression	36	20

*Multi-select responses **Percentage does not equal 100% as some fall in the category ‘other’

Mindfulness and self-compassion scores

Yoga teachers (n = 15) and students (n = 176) completed the Five Facet Mindfulness Questionnaire-Short form (FFMQ-SF) with mean scores of 93.5 ± 11.3 (1SD) and 84.7 ± 11.1 respectively. The mean FFMQ-SF without 'observe' was 76.4 ± 10.2 for teachers and 69.2 ± 10.1 for students and the FFMQ-SF 'observe facet' with a mean score of 17.1 ± 2.1 for teachers and 15.6 ± 2.8 for students (Table 2). Yoga teachers (n = 16) and students (n = 161) completed the SCS-SF with mean scores of 47.3 ± 7.7 and 40.37 ± 7.9 respectively (Table 2). Scores for teachers were significantly greater ($p < 0.05$) than students on all four measures, and with medium to large effect sizes (0.71–0.89) (Table 2), as per Cohen's d (Cohen, 1988).

Table 2. Yoga teachers' and students' mindfulness and self-compassion measures
Including: number (n), mean (M), possible score range, standard deviation (SD), t-score (t), probability (*P*) and effect size (d)

Variable		n	M	Possible Score range	SD	*t*	*P*	*d*
FFMQ-SF	Teachers	15	93.5	24-120	11.3	-2.92	0.004*	0.78
	Students	176	84.7		11.1			
FFMQ-SF (no observe)	Teachers	15	76.4	20-100	10.2	-2.67	0.008*	0.71
	Students	174	69.2		10.1			
FFMQ-SF Observe sub-scale	Teachers	16	17.1	4-20	2.1	-2.11	0.036*	0.74
	Students	175	15.6		2.8			
SCS-SF	Teachers	16	47.3	12-60	7.7	-3.34	0.001*	0.89
	Students	161	40.4		7.9			

*Denotes significant difference

Mental health measures (students)

The mean DASS21 score for yoga students (n = 172) was 20.2 ± 16.6, mean depression score 5.6 ± 7.0 (n = 171), anxiety 4.4 ± 4.9 (n = 168) and stress 10.1 ± 7.2 (171), which were all within the normal range. The mean MHC-SF score for yoga students (n = 171) was 49.6 ± 12.6 out of a possible 70 (Table 3).

Table 3. Summary of student mental health measures
Including: number (n), mean (M), standard deviation (D) and normal score range

Variable	n	M	SD	Normal Score range
DASS21	172	20.2	16.6	0-30
DASS21 – Depression	171	5.6	7.0	0-9
DASS21 – Anxiety	168	4.4	4.9	0-7
DASS21 – Stress	171	10.1	7.2	0-14
Mental Health Continuum- SF	171	49.6	12.6	0-70

Yoga practice variables (students)

Univariate analysis was used to examine the outcomes for FFMQ-SF, SCS-SF, MHC-SF and DASS21 across levels of home practice, class frequency, meditation practice and practice experience.

Home practice

An independent samples t-test showed no significant difference between the FFMQ-SF,FFMQ-SF (no 'observe'), SCS-SF, DASS21, DASS21 depression sub-scale, DASS21 stress sub-scale or MHC-SF for home yoga practice compared to no home yoga practice (Table 4). There was a significant difference for the FFMQ-SF observe sub-scale and the DASS21 anxietysub-scale, suggesting participants who practised yoga at home scored significantly higher on

the FFMQ-SF 'observe' sub-scale and DASS21 anxiety sub-scale, but effect sizes were small (Table 4).

Table 4. Home practice: Comparison of mindfulness and mental health measures between home yoga practice and no home practice.
Including: number (n), mean (M), standard deviation (SD), t-score (t), probability (*P*), degrees of freedom (df) and effect size (d)

	No home practice			Home practice						
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*P*	*df*	*d*
FFMQ-SF	49	82.6	9.7	127	85.5	11.6	-1.59	0.11	174	-0.28
FFMQ-SF (no observe)	49	67.4	8.8	125	69.8	10.5	-1.42	0.16	172	-0.13
FFMQ-SF observe sub-scale	48	14.9	2.6	127	15.9	2.8	-2.18	0.03*	173	-0.21
SCS-SF	44	40.4	8.4	117	40.3	7.7	0.07	0.95	159	0.01
DASS21	46	18.9	13.7	126	20.7	17.5	-0.66	0.51	170	0.12
DASS21-depression	46	5.7	6.8	125	5.6	7.0	0.03	0.98	169	0.00
DASS21-anxiety	45	3.3	3.8	123	4.8	5.2	-2.06	0.04*	107	-0.34
DASS21-stress	47	9.8	6.3	124	10.3	7.6	-0.39	0.69	169	-0.07
MHC-SF	47	48.6	12.7	124	50.1	12.4	-0.61	0.54	169	-0.12

*****Denotes significant difference

Class frequency

There was a borderline significant difference between class frequency and FFMQ-SF score, with the higher score in those who practiced two or more times per week; but effect size was small (0.36) (Table 5). There was a significant difference between yoga class frequency for FFMQ-SF (without 'observe') score suggesting a higher score for those who practiced two or more times compared to once per week, but again the effect size of 0.40 was small to medium (Table 5). There was no significant difference for class frequency with the FFMQ-SF observe sub-scale score (Table 5). There was no significant difference between the SCS-SF, DASS21 scores or sub-scale scores for depression, anxiety and stress; or MHC-SF for participants who practised once per week compared to those who attended two or more yoga classes per week (Table 5).

Class length

There was no significant difference between FFMQ-SF, FFMQ-SF (no observe), FFMQ-SF observe sub-scale score, SCS-SF, DASS21, Depression, Anxiety or Stress; or MHC-SF scores of participants who practise a 30–60 min class compared to 60–90 min classes (Table 6). Meditation There was a significant difference between FFMQ-SF, FFMQ-SF with no observe, FFMQ-SF Observe sub-scale and the DASS21 Stress sub-scale for those who practised meditation compared to those that did not, with small to medium effect sizes (Table 7). There was no significant difference for DASS21, Depression or Anxiety sub-scale scores; SCS-SF or MHC-SF between those that practise meditation compared to those that do not (Table 7).

Table 5. Class frequency: Comparison between mindfulness and mental health measures of people who practise yoga once per week compared to two or more times per week. Including: number (n), mean (M), standard deviation (SD), t-score (t), probability (*P*), degrees of freedom (df) and effect size (d)

Class frequency	One class per week			2 or more classes per week						
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*P*	*df*	*d*
FFMQ-SF	141	83.9	10.6	34	88.2	12.8	-2.02	0.05	173	-0.36
FFMQ-SF no observe	137	68.4	9.7	35	72.6	11.2	-2.21	0.03*	170	-0.40
FFMQ-SF Observe	139	15.5	2.7	35	16.1	3.0	-1.14	0.26	172	-0.21
SCS-SF	133	40.0	7.6	28	41.9	9.0	-1.13	0.26	159	-0.22
DASS21	138	20.6	17.0	33	18.6	15.1	0.63	0.53	169	0.13
DASS21-depression	137	5.7	7.1	33	5.2	6.5	0.42	0.67	168	0.04
DASS21-Anxiety	135	4.4	4.9	32	4.3	5.2	0.11	0.92	165	0.01
DASS21-Stress	137	10.5	7.4	33	8.8	6.5	1.20	0.23	168	0.24
MHC-SF	137	49.1	12.6	33	51.4	12.1	-0.95	0.34	168	-0.19

*****Denotes significant difference

Table 6. Class length: Comparison between mindfulness and mental health measures of people who practise a 30-60min yoga class compared to a 60-90min class.
Including number (n), mean (M), standard deviation (SD), t-score (t), probability (*P*), degrees of freedom (df) and effect size (d)

Class length	30-60 min class			60-90 min class						
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*P*	*df*	*d*
FFMQ-SF	29	82.8	10.4	127	85.2	11.5	-1.04	0.30	154	-0.22
FFMQ-SF (no observe)	30	68.0	9.4	124	69.5	10.5	-0.73	0.47	152	-0.95
FFMQ-SF Observe sub-scale	30	15.5	3.0	125	15.7	2.7	-0.31	0.81	153	-0.03
SCS-SF	29	39.8	8.4	116	40.5	7.7	-0.45	0.66	143	-0.09
DASS21	29	24.1	19.5	124	19.1	14.8	1.55	0.12	151	0.29
DASS21-depression	29	6.9	8.7	123	5.1	6.1	1.31	0.19	150	0.24
DASS21-Anxiety	28	4.5	5.3	122	4.4	4.6	0.06	0.95	148	0.01
DASS21-Stress	29	12.3	7.6	123	9.6	6.9	1.92	0.06	150	0.38
MHC-SF	29	49.3	12.3	124	49.7	12.9	-0.13	0.90	151	-0.03

*Denotes significant difference

Table 7. Meditation: Comparison of mindfulness and mental health measures between people who practice meditation and those who do not, in addition to their yoga practice
Including number (n), mean (M), standard deviation (SD), t-score (*t*), probability (*P*), degrees of freedom (df) effect size (d)

Meditation										
	No meditation			Meditation						
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*	*t*	*P*	*df*	*d*
FFMQ-SF	126	83.3	10.2	50	88.3	12.5	-2.76	0.01*	174	-0.22
FFMQ-SF (no observe)	125	68.1	9.4	49	71.8	11.3	-2.22	0.03*	172	-0.36
FFMQ-SF Observe sub-scale	125	15.3	2.8	50	16.4	2.5	-2.51	0.01*	173	-0.43
SCS-SF	117	39.8	7.8	44	41.8	8.0	-1.44	0.15	159	-0.25
DASS21	123	21.4	17.0	49	17.3	15.1	1.47	0.14	170	0.24
DASS21-depression	123	5.9	7.2	48	5.0	6.2	0.78	0.44	169	0.14
DASS21-Anxiety	118	4.4	4.8	50	4.4	5.2	-0.06	0.95	166	-0.01
DASS21-Stress	122	11.0	7.5	49	8.0	6.1	2.45	0.02*	169	0.43
MHC-SF	122	49.1	12.7	49	51.1	12.2	-0.95	0.35	169	-0.16

*Denotes significant difference

Practice experience

Practice experience in months was positively correlated with the FFMQ-SF (no observe), FFMQ-SF observe sub-scale and SCS-SF, suggesting higher mindfulness and self-compassion scores with more months of practice. However, effect sizes were small to medium (r = 0.18–0.27). There was a negative correlation between DASS21, DASS21 depression and DASS21 stress scores with months of practice, suggesting lower DASS21, depression and stress sub-scales with months of practice; but effect sizes were again small (r = −0.17-0.22). There was no correlation between DASS21 anxiety sub-scale scores or the MHC-SF and months of yoga practice (Table 8).

Table 8. Practice experience: Correlation of mindfulness and mental health measures and months of practice.
Including number (n), Pearson's correlation (r), probability (*P*) and degrees of freedom (df)

	Practice experience			
Variable	*n*	*r*	*P*	*df*
FFMQ-SF	168	0.24	0.002*	166
FFMQ-SF (no observe)	165	0.19	0.011*	163
FFMQ-SF Observe sub-scale	167	0.20	0.010*	165
SCS-SF	153	0.28	0.000*	151
DASS21	164	-0.21	0.007*	162
DASS21- depression	163	-0.17	0.027*	161
DASS21-Anxiety	160	-0.12	0.13	159
DASS21-Stress	163	-0.23	0.003*	161
MHC-SF	164	0.10	0.18	162

*****Denotes a significant correlation

Mixed model analysis

Linear mixed model analyses were used to test for significant relationships between the predictors: home practice, class frequency, meditation practice, and practice experience and outcomes: FFMQ-SF, SCS-SF, DASS21 variables and MHC-SF. Predictors identified in the univariate analysis with a *P* value < 0.2 were included in an initial multivariable model. The conservative *P* value of < 0.2 was used as some covariates may not be significant in a univariate regression but are significant in a multivariate regression. The covariates in the multivariate analysis with highest *P* value were removed one at a time via a process of backwards elimination, and the process was repeated until all covariates had a *P* value < 0.05.

There was a statistically significant association between FFMQ-SF and class frequency (*P* = 0.048), meditation (*P* = 0.002) and practice experience (*P* = 0.001) in the multivariate analysis. Those practising yoga two or more times per week had a 4.0 unit higher mean FFMQ-SF score (95% Cl: 0.0, 8.0) compared to those who practiced once per week. Those with a meditation practice had a 5.6 unit higher mean FFMQ-SF score than those who did not (95% CI: 2.0, 9.1), and there was a 0.02 increase in mean FFMQ-SF score with each month increase in practice experience (95% CI: 0.0, 0.0). FFMQ-SF no observe also showed a significant association with class frequency (*P* = 0.03), meditation practice (*P* = 0.02) and practice experience (*P* = 0.01). The FFMQ-SF observe facet showed a significant association with meditation (*P* = 0.006) and practice experience (*P* = 0.01) (Table 9). The SCS-SF had a significant association with practice experience (*P* = 0.00) (Table 9). The DASS21 stress and depression facets showed a significant association with practice experience and the stress facet with meditation, suggesting that lower scores occur with increased practice experience and increased meditation practice respectively. The MHC-SF, DASS21 and DASS21 anxiety facets did not show any significant associations with the variables measured (Table 9).

Table 9. Mixed model analysis of Independent Variables (IV) of home practice, class frequency, meditation practice and practice experience predictors on Dependent Variables (DV) of FFMQ-SF, FFMQ-SF No observe, FFMQ-SF Observe, SCS-SF and DASS21. Including estimate, F, *t*, *P* and 95% confidence interval.

						95% Confidence interval	
DV	IV	Estimate	F	*t*	*P*	Lower	Upper
FFMQ-SF	Class Frequency	4.01	3.98	1.99	0.048*	0.0	8.0
	Meditation	5.57	9.48	3.08	0.002*	2.0	9.1
	Practice Experience	0.02	11.32	3.37	0.001*	0.0	0.0
FFMQ-SF	Class Frequency	4.02	4.76	2.18	0.03*	0.4	7.7
(No observe)	Meditation	4.15	6.04	2.46	0.02*	0.8	7.5
	Practice Experience	0.02	7.45	2.73	0.01*	0.0	0.0
FFMQ-SF	Meditation	1.30	7.64	2.76	0.006*	0.4	2.2
-Observe	Practice Experience	0.01	6.35	2.52	0.01*	0.0	0.0
SCS-SF	Practice Experience	0.02	13.12	3.62	0.00*	.0	0.0
DASS21	Practice Experience	-0.02	7.34	-2.71	0.07	-0.0	-0.0
DASS21	Practice experience	-0.01	8.28	-2.88	0.005*	-0.0	-0.0
- Stress	Meditation	-3.36	7.38	-2.72	0.007*	-5.8	-0.9
DASS21	Practice experience	-0.01	3.07	-1.75	0.08	-0.1	0.0
- Anxiety	Home practice	1.51	2.94	1.72	0.09	-0.2	3.3
DASS21 – depression	Practice experience	-0.01	-4.99	-2.24	0.03*	-0.0	-0.0
MHC-SF	Practice experience	0.01	1.78	1.33	0.18	-0.0	0.0

Discussion

In this study, both yoga teachers and students recognised the mental health benefits of yoga. Stress management was identified as a strong motivator for yoga practice and nearly half of all survey participants practiced yoga to reduce or manage anxiety, and many to reduce or manage depression. Findings were similar to the 2006 Yoga in Australia Survey (Penman et al., 2012) of nearly 4,000 yoga teachers and students, which found that many people practice yoga for mental health benefits such as stress management.

Yoga teachers scored significantly higher than students in all measures of mindfulness and self-compassion and had an average of 24.4 years of yoga experience compared to 8.4 years for students. The explanation for higher mindfulness and self-compassion scores for teachers may be their increased exposure to yoga and mindfulness practices over time, their intensive training and ongoing professional development, and the possibility that people with higher mindfulness levels may be attracted to yoga teaching. Similarly, other studies have shown higher mindfulness levels in people who meditate over a long period of time compared to non-meditators (Baer et al., 2012; de Bruin et al., 2012), suggesting practice experience over time may be an important factor.

Relationships were identified between class frequency, practice experience and meditation with mindfulness measures in this study. Practice experience was associated with higher mindfulness and self-compassion levels and decreased DASS21 stress and depression levels with months of practice, again suggesting that consistency of practice over time is an important factor. The Depression, Anxiety and Stress (DASS21) scores tended to decrease with months of practice in the univariate analysis but this was not supported in the multivariate analysis and may need further research.

Class frequency was an important factor for mindfulness, with higher levels of two or more classes per week compared to one class per week. Interestingly, class length did not influence any of the mindfulness or psychological measures, suggesting the duration of the class is not as important as consistency and frequency of yoga practice. This is consistent with other research into yoga interventions (Sherman, 2012) and general community practice (Penman et al. 2012), which suggest a minimum of two classes per week.

Those who have a meditation practice scored lower DASS21 stress and higher mindfulness levels, as expected and is consistent with other research (Baer et al., 2012). This study did not show a significant relationship between mindfulness and self-compassion with depression, anxiety and stress scores for most domains, however this may be related to the low DASS21 score ranges of participants. Yoga classes that emphasise mindfulness are thought to be particularly helpful for people with anxiety and depression (Uebelacker & Broughton, 2016), and these findings may be more significant in a clinical population.

The benefits of other specific class components were not explored in this study; however, postures, breath-work and meditation were identified in all, and music and spiritual aspects in over 50% of classes, suggesting these are common practices in general yoga classes. Similarly, in a Delphi study by de Manincor et al., (2015); specific practices of breath regulation, meditation and relaxation were identified as important components of yoga practice for depression and anxiety.

Home practice did not influence mindfulness or mental health outcome measures in the multivariate analysis; however, 72% of yoga students engaged in home yoga practice suggesting some perceived benefit to individuals. Interestingly, those who had a home yoga

practice had a significantly higher FFMQ-SF observe sub-score and DASS21 anxiety sub-score in the univariate analysis. This may be related to the theory that 'Observing' and self-focused attention of the FFMQ-SF may be maladaptive in those without meditation experience and may increase self-judgment and self-critical responses (Baer et al., 2008; de Bruin et al., 2012). Findings may also suggest that home practice is undertaken by participants who are experiencing more anxiety, possibly as a strategy to improve confidence and reduce anxiety related to yoga skills.

Key characteristics identified in this study for the design of a yoga intervention exploring mindfulness, self-compassion and measures of stress, anxiety and depression include recommendations of yoga class practice twice a week, and home practice and additional meditation practice. Class length was not deemed to be an important factor for the mindfulness and mental health measures examined in this study.

Limitations include that this study was limited to South Australia, and yoga teachers and students who were interested in being involved, which may have created a bias toward particular populations. Yoga teachers needed to complete a web-based survey, which may have excluded possible participants. Similarly, yoga students had to complete either a web-based or hard-copy survey as nominated by their teacher, either of which method may have influenced completion rates. Finally, the proposed characteristics identified in this study for a future yoga intervention do not address issues of feasibility, practicality or consumer perspectives.

Conclusion

This research project provided important insights into designing a yoga intervention exploring mindfulness, self-compassion and measures of stress, anxiety and depression. Overall, findings

suggest that factors to consider in yoga course design include practice frequency with a minimum of two classes per week indicated; and additional meditation practice and home practice. Practicing yoga over a long period of time appears to be a consistently important factor for a positive influence on mindfulness and self-compassion. Further research is needed to explore the long-term benefits of yoga on mindfulness and self-compassion levels and the relationship with depression, anxiety, stress and wellbeing scores in a clinical population.

Declaration of interest

None

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Authorship

All authors have materially contributed to the conception and design of the study and interpretation of data, drafting of the article and have approved the final article.

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CHAPTER 6. The practicability and relevance of developing a yoga intervention for mental health consumers: a qualitative study

Please note: The published article is included as Appendix 6

Statement of authorship

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Contribution to paper:	Developed the research proposal; conducted searches and retrieved papers; conducted all participant interviews; coded, appraised and extracted data; acted as corresponding author; wrote and revised the manuscript based on supervisor and reviewer feedback.
Overall percentage:	85%
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper
	28/6/2021
Signed	Date

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The candidate's stated contribution to the publication is accurate (as stated above)

Permission is granted for the candidate to include the publication in the thesis; and

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Abstract

The aim of the study was to understand the perspectives of mental health consumers, staff and yoga teachers on the characteristics of a yoga-based intervention to be developed for consumers with a chronic mental health condition, in addition to anxiety and/or depression. Two focus groups were held with mental health consumers (n=8), two focus groups with mental health staff (n=13) from a metropolitan community mental health setting, and five one-on-one interviews with yoga teachers. Participants were asked about the feasibility and appropriateness of a range of yoga practice features to be tested as a newly-developed yoga-based intervention. Thematic analysis was used to identify themes. Findings included the following consumer themes: Mental health understanding and experience of teachers and participants is important; and creating a safe space and yoga practice elements. Staff themes included mental health understanding and experience of teachers is important; environmental design and yoga practice elements. Yoga teacher themes included environmental design and yoga practice elements. mental health understanding and experience of the yoga teacher, and trauma-informed care were consistently emphasised by consumers and staff. Teachers focused less on specific mental health considerations, which may be reflective of a broader knowledge gap. Recommendations regarding yoga practice elements, including pre-information, regular and consistent practice, modifications, breath-work, mindfulness and guided practice, and environmental design features, were consistent with current trauma-informed yoga research. Findings will be used to guide the development of a yoga-based intervention for consumers with a chronic mental health condition, in addition to anxiety and/or depression.

Keywords: Yoga, intervention, mental health consumers, qualitative study, anxiety,depression

Introduction

Yoga-based interventions are increasingly being recognised as an effective adjunct therapy for a range of mental health conditions, including anxiety (Cramer et al., 2013; Kirkwood et al., 2005; Uebelacker & Broughton, 2016), depression (Cramer et al., 2013; da Silva et al., 2009; de Manincor et al., 2016; Pilkington et al., 2005), stress (Penman, 2008; Varambally & Gangadhar, 2012) and trauma (van der Kolk, Stone, West… et al., 2014). The physiological and psychological mechanisms of yoga practice on the stress response and proposed mental health outcomes are illustrated in the yoga and mental health model developed by Butterfield, Schultz, Rasmussen, and Proeve (2017). This model describes proposed positive changes of yoga practice on the parasympathetic nervous system and development of psychological skills such as mindfulness and self-compassion, which in turn may lead to reduced anxiety and depression.

The mindfulness aspects of yoga are thought to be particularly beneficial for symptoms of anxiety and depression by facilitating emotional regulation (Bussing, Michalsen & Khalsa… et al., 2012; Davidson, Kabat-Zinn, & Schaumacher, 2003; Uebelacker et al., 2010a). Yoga focuses on the sensory experience of body and breath awareness; learning to notice, tolerate and manage physical sensations; and regulate the autonomic nervous system (van der Kolk et al., 2014).

Yoga may appeal to mental health consumers due to concerns regarding side effects, stigma and cost of traditional pharmaceutical therapies (Macy, Jones, Graham… et al., 2015). However, accessing yoga in the general community may be difficult for people with a chronic mental health condition (psychotic or mood disorder) due to perceived stigma, symptoms of their illness such as auditory or visual hallucinations, paranoia, dissociation,

self-consciousness, high levels of anxiety and/or side effects of medication. Experiences of trauma, cost, and access may also be barriers. There is minimal research evidence or existing protocols for designing yoga-based interventions specifically for mental health consumers with a chronic mental health condition, in addition to anxiety and/or depression.

This paper presents the second phase of a PhD research project on yoga and mental health, which involved consultation with mental health consumers, and staff and yoga teachers in designing a yoga-based intervention. Phase one involved surveys to yoga teachers and students on their yoga practice and teaching experience, yoga practice characteristics and psychological and mental health measures.

The aim of this study was to understand the perspectives of mental health consumers, staff and yoga teachers on the characteristics of a yoga-based intervention to be developed for mental health consumers with a chronic mental health condition (psychotic or mood disorder) in addition to anxiety and/or depression. This research provides a platform for an exciting new direction in nursing practice to work collaboratively with alternative therapies in providing evidence-based care.

Methods

A qualitative descriptive study was conducted to understand the perspectives of mental health consumers, staff and yoga teachers on the characteristics of a yoga-based intervention to be developed for mental health consumers with a chronic mental health condition in addition to anxiety and/or depression. Focus groups were undertaken with mental health consumers and staff from a metropolitan community mental health setting, and interviews with South Australian yoga teachers from October 2016 until April 2017.

Ethics approval was gained from the Southern Adelaide Clinical Research Ethics Committee and the University of Adelaide (Appendix 7).

Focus group and interview questions included what is feasible and appropriate for people with a chronic mental health condition regarding:

1. Yoga practice class duration, frequency, intensity and components
2. Home practice
3. Environmental features of the room
4. Teacher qualities
5. Recruitment strategies
6. Data collection

Participants

Mental Health Consumers

Mental health staff received an email from the sector manager (Appendix 8), introducing the research project, and inviting them to identify consumers who meet the inclusion/exclusion criteria. Suitable consumers were then invited to participate in a focus group by their care coordinator. Information flyers (Appendix 9) were also displayed in the waiting area of the Community Mental Health Service to recruit consumers, who then needed to speak with their care coordinators to register their interest. The consumer's community mental health team discussed the project requirements and consented participants (Appendix 10). Two focus group were held with a total of eight participants.

The inclusion criteria for mental health consumers were: that they were mental health consumers of a specific metropolitan community mental health setting; medically and mentally stable and not experiencing significant health problems, stressors or treatment regimes that may impact on, be affected, or worsened by participation, as deemed by the consumer's treating mental health team; self-report experiencing anxiety and/or depression; cognitively able to understand basic instructions related to yoga practice; able to give informed consent to participate and not pregnant. Participants were included regardless of previous or current experience with yoga.

Mental Health Staff

Mental health staff were invited by email to participate in a focus group (Appendix 11). Mental health staff were invited to participate in the focus groups because of their knowledge and experience in working with mental health consumers and in trauma-informed care.

Two focus groups were held with a total of 13 participants. Inclusion criteria were that they were clinical mental health staff, including Nurses, Occupational Therapists and Social Workers, working with consumers in a metropolitan community mental health setting and available to participate in a focus group on the days and times allocated.

Yoga Teachers

Yoga teachers who had already registered their interest in participating in this phase of the research project as part of a previous study (Snaith, Schultz, Proeve, & Rasmussen, 2018) were contacted by email (Appendix 12) and invited to participate in a phone interview. Interviews were conducted with the yoga teachers as a focus group was too difficult to organise with their varying schedules and locations, including country areas.

Five yoga teachers were interviewed. Inclusion criteria for yoga teachers were that they were part of the initial study, had registered their interest in participating in the next phase of the research and were available for a one-on-one interview within a specific timeframe. The qualifications and experience of yoga teachers included one provisional teacher (200hr), two level one (350 hour), one level two (500hr) and one level 3 (1000hr), as per Yoga Australia training requirements. Mental health experience was not a pre-requisite as this would have significantly limited the sample size and is not an accurate representation of yoga teachers.

Data analysis

Recordings of the focus groups and interviews were transcribed, and thematic analysis undertaken. Thematic analysis comprised identification, analysis and interpretation of patterns of meaning (themes) in data (Braun & Clark, 2006; Clark & Braun, 2017). Thematic analysis was the most appropriate data analysis for this study due to its flexibility with research question, sample size, data collection and approaches (Clark & Braun, 2017; Roulston, 2001). Specifically, this study used the Braun and Clarke (2006) six-step thematic analysis process: becoming familiar with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and producing the report. The focus group and interview recordings were transcribed verbatim by author NS. Transcripts were read through several times and initial codes generated by author NS. Step three and four involved searching for themes and refining them by authors NS and PR. The essence of the themes were then discussed, finalised and defined with all authors.

Results

Consumer themes

Consumer themes included: ‘Mental health understanding and experience of the teacher and participants is important’, ‘Creating a safe space’ and ‘Yoga practice elements’ and a total of 11 sub-themes (Table 10). The themes will be discussed separately and in no hierarchy of importance.

Table 10. Consumer themes

Theme	**Sub-theme**
Mental health understanding and experience of the teacher and participants is important	Mental health understanding and experience
	Relationship with the teacher
	Relationship and shared experience with peers
	Anxiety and feeling prepared
Creating a safe space	Environmental features
	Knowing and feeling safe with other participants
	Avoiding physical adjustments
	Gender of participants
Yoga practice elements	General yoga practice guidelines
	Increasing duration and intensity over time
	Breath-work, mindfulness and guided practice

Mental Health understanding and experience of the teacher and participants is important

Consumers consistently emphasised the importance of the yoga teacher understanding and having experience in mental health. One consumer explained: 'If you feel like you are going to have a panic attack or dissociate or on a thought train … having someone directing you who is aware of that kind of stuff.' (1). A yoga teacher who knows how to support and guide participants through mental health symptoms and experiences was considered important.

The relationship between the teacher and participant was also highlighted by consumers. One consumer described: 'You want to know your instructor and feel comfortable with your instructor, so if you are having any problems you can discuss these' (2). Similarly, support and personal follow-up from the yoga teacher was viewed as valuable. For example, one consumer suggested: 'A follow-up call would be a good thing if missed a class – just 'are you ok', no pressure to return' (6). Developing a therapeutic relationship and rapport between teachers and consumers was considered essential for their ongoing participation.

Consumers also identified the relationship with other participants as important. One consumer explained: 'I think that if there is a group focus of being with similar stories and issues, there would be that understanding that it is really hard for us' (1). Other participants (3, 8) agreed with this statement. The shared experience of doing yoga with mental health peers was emphasised as important for consumers to feel comfortable in the yoga class.

Anxiety was identified as a common barrier to participating in a yoga class. One consumer explained: 'Most of us from trauma have high fear levels … what if they think I have done that the wrong way or in the wrong place … then don't do anything' (5). Consumers identified

anxiety about the course and meeting other participants as a barrier to attendance, which they generally felt could be eased by a pre-information session to help them feel prepared.

Creating a safe space

The need to feel safe in the physical environment of the room, during yoga practice, and with other participants was a consistent theme. Consumers generally agreed that the room should be private, quiet, soft but not too dim lighting, and adequate personal space. Consumers also spoke of knowing the other participants and feeling safe around them. One consumer described: 'With mental health, you feel a little bit more comfortable, because you're with people who … know you are going through stress …' (3). Suggesting again that the shared group experience of yoga and building rapport with other participants is important for participants to feel safe in class.

Avoiding physical adjustments and contact by the teacher was also highlighted as a personal space and safety issue. One participant explained: Touching and stuff like that, … if I want help, but if it's just someone randomly walking past me and going ok (demonstrates physical adjustments). I'm thinking 'get your hands off please. Often they don't ask permission – I like personal space please people (1).

Gender of group participants was raised as an issue by consumers and some reported that they may not feel comfortable with males in the group. One consumer rationalised: 'I don't know how I would feel about a male, a mixed group. Being in a dark room with males, I would probably really struggle with that – especially if you've had trauma issues (1). Indicating that a yoga group with male participants may not be appropriate for some female consumers or those who have experienced trauma such as sexual assault.

Yoga practice elements

Consumers generally agreed that a yoga course of 30-60-minute classes twice per week over 10 weeks during the school term, and with guided home practice was appropriate. The importance of regular yoga practice and increasing practice duration and intensity over time was emphasised. One consumer explained: 'I think to start with I probably, even though it might seem hard, I'd probably want somewhere I went twice a week, so I am learning and creating that habit' (1). However, others felt this was unrealistic, and one consumer stated: 'Getting to a class I would only commit to once a week – that's only because of my lifestyle at the minute' (4). There was more of a consensus over class duration, and one consumer described: 'Beginners, I'd say 30 mins, as you kind of lose interest easily, but over time I think an hour and over is … really good. But I couldn't do that when I first started' (2). Consumers recognised the need to build up yoga practice over time and the importance of consistency to implement it as a lifestyle change.

The importance of breath-work, mindfulness and guided practice was emphasised by consumers. For example, one consumer explained: 'Would be good for stress wouldn't it … breathing and all that…that's the first thing I thought of' (7). Some participants spoke more specifically about the importance of mindfulness: 'Teaching mindfulness – emphasising that you are teaching mindfulness' (3). One consumer described the benefits of guided practice and mindfulness for mental health:

> … when you're dealing with mental illness and stuff, people have dissociations … they do need that voice to keep you grounded. I struggle to be in the present, so anything that gets you to focus on being in the now is really grounding … (1).

Staff

The themes from staff interviews included: 'Mental health understanding and experience of the teacher is important', 'Environmental design' and 'Yoga practice elements' and 11 sub-themes (Table 11).

Table 11. Staff themes

Theme	**Sub-theme**
Mental health understanding and experience of the teacher is important	Mental health understanding and experience
	Understanding specific symptoms and experiences
	Relationship between teacher and student
	Providing pre-information
Environmental design	Environment and room features
	Trauma-informed perspective
	Participants allowed to choose own mat space
Yoga practice elements	General yoga practice guidelines
	Increasing practice duration and intensity over time
	Modifications
	Breath-work, mindfulness and meditation

Mental health understanding and experience of the teacher is important

Staff consistently spoke of the importance of the yoga teacher having an understanding and experience with mental health. One staff member described how a yoga teacher should be: 'Loving, compassionate, accepting of people's mental states as the experience of the individual not the mental health system. A practical example of ahimsa' (3). Other staff spoke about the

teacher understanding consumers' specific mental health symptoms and experiences. For example, one staff member explained:

> I know some of my consumers have said when I suggest things like yoga – they've said I'm not quite sure how I'm going to block out the voices whilst I'm doing it. They are worried that the voices are going to become more intense when they are trying to relax (10).

The importance of the yoga teacher having knowledge and experience in mental health and being able to sensitively guide and support consumers experiencing symptoms and/or side effects of medication was consistently stressed by staff. Subsequently, the relationship between the teacher and the mental health consumer was also considered important. One staff member explained: 'Personal follow-up and developing the relationship with the teacher/participant will be important' (5). This was particularly emphasised in relation to recruitment and retention of consumers to the yoga course.

Providing pre-information on the etiquette of yoga, particularly personal hygiene, was considered imperative for this consumer group. One staff member explained: 'Some of the consumers don't shower for weeks, so that might be an issue, but we still want to empower them to participate' (10).

Staff acknowledged the challenges that consumers often face with self-care and hygiene and related barriers to community-based activities; but indicated that providing pre-information may support consumers to prepare and have the confidence to participate.

Environmental design

Mental health staff generally described the ideal yoga room design as quiet with soft lighting, plenty of space and music. Staff also highlighted the importance of considering a trauma-informed perspective in the yoga room set-up. One staff member explained:

> I think the environment would need to be relevant to the group – especially in considering a trauma-informed perspective and understanding that people with chronic mental distress are likely to have experiences in trauma in different environments. That said, introducing experiences that are safe is positive in overcoming negative environments (3).

This suggests that it is important to know the participants' backgrounds, to minimise triggering traumatic experiences but also to facilitate space for a positive experience in potentially traumatic environments such as group settings. Similarly, the yoga teacher allowing participants to choose their own mat space was a strong theme. For example, one staff member described:

> Yes, definitely good to be able to choose yourself where you are because I know being a beginner person, I didn't want everyone to see how crap I was at it and I didn't want to be squished in. That relaxation sort of thing of not being rushed and being able to choose your spot so you don't feel intimidated that everyone is going to look at you (10).

Suggesting that consumers being able to choose where they place their mat may help ease anxiety but also relates to the importance of having a choice and control over their practice from a trauma-informed perspective.

Yoga practice elements

Mental health staff generally agreed that working up to a 45-60 minute class twice per week, short optional home practice and a 10-week yoga course during the school terms would be most appropriate for this consumer group.

Yoga class frequency was a discussion point amongst staff with differing views between one or two classes per week. One staff member explained: 'I would have thought once a week but twice if achievable, as may create more of a routine' *(*4). Similarly, another staff member rationalised: 'Twice a week may actually increase it (attendance), because it's a bit like exercise, if you go to the gym and it makes you feel good then you are looking forward to going back again' (12). However, some staff suggested twice a week may be too much for some consumers depending on their commitments.

Staff generally acknowledged that while twice per week yoga classes may not be achievable for all consumers, it is important to offer this to consumers in order to encourage them to create a lifestyle change and to develop a yoga routine.

Home practice was recommended by most staff but there were concerns over the delivery and adherence. For example, one staff member suggested: 'I think daily practice … you could maybe give them the information and if they want to do at home, but I don't know whether it would actually be done' (7). Several staff (6, 8, 9, 11, 12, 13) agreed with this statement. Staff were generally keen to avoid the concept of 'homework' and suggested that optional and guided home practice may be more achievable for consumers, but that adherence may still be an issue.

Increasing yoga practice intensity and duration over time was a consistent theme. For example, one staff member suggested: ‘A really gentle introduction on the first day and explanation that things will become more familiar with repetition, so that participants feel more confident with what is coming’ (2). Similarly, in regard to class duration another staff member emphasised: ‘I still think 60 minutes is most achievable, people would be put off even going if they knew it was 90 minutes’ (1). Staff emphasised that consumers need time to build up confidence and familiarity, along with the duration and intensity of their yoga practice.

Breath-work, mindfulness and meditation were highlighted as important components of the yoga practice. One staff member described the essential elements of the yoga class as: ‘Breath-work and mindfulness and learning to stay present moment focused’ (5). Most staff identified breath-work, and many mindfulness or meditation as important for grounding and focusing participants during yoga practice.

Modifications to practice and the use of props (equipment) for yoga practice were considered particularly important for this consumer group. One staff member described:

> I think having the modified things. Where it’s an environment where it’s not like you are doing it right or wrong and you’re not ‘failing’ and things like that. You’re all, everyone is at a different stage (11).

Staff suggested that providing modifications and options (For example. intensity or type of posture) to suit individual needs as well as the use of props, such as blocks and bolsters, may support consumers to feel a sense of self-achievement and acceptance of where they are in their yoga journey.

Yoga teachers

The themes derived from yoga teacher interviews included environmental design and yoga practice elements and six sub-themes (Table 12).

Table 12. Yoga teacher themes

Theme	**Subtheme**
Environmental design	Environment and room features
	Community and sense of belonging
Yoga practice elements	General yoga practice guidelines
	Breath-work, meditation and mindfulness
	Yoga teacher characteristics and teaching style
	Providing information

Environmental design

Environmental design of the yoga room and class was a common consideration by yoga teachers. One teacher described: 'Indoors, safe, quiet and calm space to be able to go within, room pre-setup, soft lighting. A very calm, well-prepared and welcoming space and teacher.' (1). One teacher who had some experience in mental health explained: 'Having volunteered in mental health inpatients there are definitely things that need modifying to a general yoga class, for example smaller groups (4-10) much better, larger groups can 'up' people's anxiety before they start (5).

Teachers consistently emphasised the need for a quiet, calm and safe space, but also acknowledged some modifications may be required for mental health consumers. Teachers emphasised the social aspects of the yoga class and the feeling of 'belonging' to a community

as important to encourage participants to continue attending and commit to a regular yoga practice.

Yoga practice elements

Teachers suggested that working up to a 75-90-minute yoga class, one to two times per week and home practice over 10 weeks would generally be suitable for this consumer group. For example, one teacher explained: '90 minutes is a bit too long, 1hr 15min, keep the flow going with clear directions and not hurried. Twice per week in class and home practice with guided audio' (3). The importance of creating a community feel and participants experiencing a sense of belonging was highlighted by yoga teachers. One teacher suggested: 'Create a safe and welcoming community. Offer tea, simple snack food after class to stay back and get to know one another. Give time to get to know the students and a space where they can mingle' (1). Teachers consistently emphasised the importance of regular practice, home practice and a longer class duration.

Yoga teachers emphasised guided breath-work, meditation and mindfulness, as important elements of yoga practice. One teacher explained: 'Breath-work is very important to get full benefits of yoga, asana/postures, meditation and/or yoga nidra' (1). Another detailed more specific breath-work and guided practices: 'Yoga nidra, diaphragmatic breathing, belly breath, and participants not left alone with own stuff' (4). Mindfulness practices were commonly emphasised, as one teacher described: 'Keep things simple, basic asanas, basic breath techniques and shorter relaxations to start. Mindfulness practices on senses, what you can see hear feel etc' (5). Most yoga teachers recommended guided breath-work, meditation and mindfulness as central to yoga practice for this consumer group.

Yoga teacher characteristics and teaching style were also considered important. One teacher described the ideal yoga teacher as: 'Experienced, confident, welcoming, gentle teaching style with focus on the breath' (1). Another teacher spoke more specifically of the teacher's use of language:

> Able to give options using language that doesn't highlight if they are unable to do something, but rather about making it a choice depending on individual preferences, awareness of their use of language and position in the room (2).

Teachers indicated the importance of using non-judgemental invitational language, being aware of their body language and facilitating personal choice with yoga practice.

Providing information was considered a key aspect of the yoga course. One teacher explained: 'Clear information so people know what to expect beforehand as many people have mis-conceptions and a fear of yoga' (2). The importance of preparing and providing information to participants to minimise their anxiety before the yoga course was emphasised.

Discussion

Mental health experience and understanding of the yoga teacher was a key finding consistently highlighted by consumers and staff in this study, and consistent with other research on yoga for people with anxiety and/or depression (de Manincor, et al., 2015). Staff and consumers emphasised the need for teachers to guide students experiencing symptoms or side effects of medication in a sensitive and non-judgemental way, which appears to be a unique finding from this study. Justice, Brems, & Ehlers (2018) discussed the importance of understanding the impact of medication, such as sedation, on yoga participants but not how to support them to manage this in a class environment. The results of this study confirm that implementing a yoga-based intervention needs to consider how to support the mental health of participants.

Generally, most research in this area has focused on the recommended yoga practice and teacher characteristics, rather than on the individual's mental health experiences and how to integrate them into a yoga practice. Interestingly, yoga teachers in this study did not consider this aspect either, which may indicate limited knowledge and experience in working with people with chronic mental health issues. This may explain why mental health consumers have reported to the lead author that they may find it difficult to access yoga in the general community (Snaith N, unpublished data, 2017).

The need for a calm, private and quiet space was a common theme. Staff also focused more specifically on the need for a trauma-informed approach including active participant consultation and choice with room set up. This is consistent with trauma-informed yoga research, which emphasises creating safety by encouraging participant engagement in practice space set-up and modifications (Justice, et al., 2018). Similarly, consumers placed strong emphasis on creating a 'safe space' and minimising triggers, including avoiding physical adjustments and for some, mixed gender classes. This also aligns with research on trauma-informed yoga, which suggests physical adjustments and touch can be very traumatic and triggering for people with a history of abuse, sexual assault, or other trauma, and that gender dynamics need to be considered in classes (Justice et al., 2018). Interestingly, yoga teachers often use physical adjustments in class; suggesting avoiding physical adjustments is an important finding to disseminate within the yoga teaching community.

The need for a regular and consistent practice in class and at home is consistent with previous research (de Manincor, et al., 2015). Although teachers suggested longer classes (90 min) than staff and consumers with experience in mental health (60 min), there is limited information available on the recommended amount of yoga to achieve benefits. In a review article Sherman

(2012) found that most studies of the physical benefits of yoga, suggested 60-90 minute classes once or twice per week. More recently, de Manincor et al., (2015) undertook a Delphi study to design a yoga-based intervention for reducing anxiety and depression, and recommended 30-40 minutes practice five times per week for six weeks. Although this research was based on individual yoga sessions rather than group yoga classes, it may provide some guidance on suitable yoga session length for this cohort of consumers.

Breath-work and mindfulness were considered important yoga practice elements by all three participant types in this study and other studies testing breath-work (Brown & Gerbarg, 2005; de Manincor, et al., 2015) and mindfulness (Chiesa & Serretti, 2009; Evans, Cousins, Tsao, et al., 2011) for anxiety and depression. Breath-work and meditation (and mindfulness as a specific technique) are important facets of traditional yoga and benefits are reported by yoga practitioners; but they are often viewed as separate practices with a focus on physical postures in modern yoga (de-Manincor et al., 2016). Interestingly, some researchers suggest that mindfulness with body work is more successful in treating over-reactive physiological responses learnt through trauma as it focuses on building interoceptive awareness rather than avoidance (Salmon, Lush & Jablonski… et al., 2009). This paper supports the growing research evidence of the importance of practicing yoga as an integrated whole-systems approach, including breath-work, meditation and postures.

Consumers and staff also spoke of the importance of guided practice and minimal quiet time. Interestingly, this is similar to some aspects of trauma-informed yoga research which recommends guided meditation practices that invite interoception, rather than too much silence and self-reflection time (Justice et al., 2018). Similarly, de Manincor et al., (2015) recommended guided mindfulness practices as more important than meditation and suggested

avoiding meditation without a specific focus in designing a yoga-based intervention for anxiety and depression. The development of interoceptive skills and the ability to self-direct is thought to improve with practice (Farb, Daubenmier & Price, et al., 2015). This study further strengthens the notion that guided practice and less reflective time is important for people with anxiety and depression, and uniquely obtained through the direct insights and experiences of mental health consumers and staff.

The importance of modifications, invitational language and body language were emphasised by teachers and staff, concepts which are central to trauma-informed yoga (Justice et al., 2018). Trauma-informed care, which considers an individual's trauma history, is a focus of contemporary mental health care and the trauma-informed yoga movement has emerged from these recommendations from the health care profession (Emerson, Sharma & Chaudhry… et al., 2009). Trauma-informed yoga is adapted to the individual's needs and aims to create a safe space for participants to learn how to respond to their symptoms and experiences rather than become overwhelmed (Justice et al., 2018). An important and emerging finding of this research was the emphasis on trauma-informed care in yoga for mental health consumers with a chronic mental health condition in addition to anxiety and depression, which was highlighted in many elements of yoga practice by staff and consumers, and in some elements by teachers.

Limitations

Recruitment was difficult across the participant types due to staff and teachers' busy schedules and the reliance on staff to recruit consumers. This may have biased consumer participants towards those particularly interested in the study and/or higher functioning consumers. Several of the mental health consumers had a diagnosis of Borderline Personality Disorder in addition to anxiety or depression, which is a disorder with specific characteristics quite different to the

psychosis-based diagnosis also found in this consumer group. Therefore, results may be a less general representation of the consumers who utilised the service.

Conclusion

There is minimal research evidence or existing protocols for designing yoga-based interventions specifically for mental health consumers with a chronic mental health condition, in addition to anxiety and/or depression. Therefore, this research project aimed to consult with mental health consumers, staff and yoga teachers to inform a yoga-based intervention. This was a unique approach which yielded important insight into the perspectives and individual experiences of mental health consumers, staff and yoga teachers, and how to integrate into a yoga-based intervention which would provide direction for future yoga research, teaching and practice.

Key findings were: the importance of mental health understanding and experience of the yoga teacher, and trauma-informed approaches to environmental design, teaching and practice. Specific yoga practice elements included the importance of regular and consistent practice, providing pre-information and including modifications, breath-work, mindfulness, and guided practice for this consumer group. Yoga teachers did not identify specific mental health or trauma-informed care needs. The specific components, teaching style and experience, and broader underpinnings of the yoga-based intervention will be developed and tested in the next phase of this research project.

Relevance for clinical practice

This innovative nursing-led research project provided important information for developing more mental health awareness, including a trauma-informed yoga program for mental health consumers. The consultation process delivered unique insights into the perspectives of mental health consumers, staff and yoga teachers, who are not usually considered in designing general yoga classes. This research provides a platform for an exciting new direction in nursing practice to work collaboratively with alternative therapies in providing evidence-based care.

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Authorship statement

All authors listed meet the authorship criteria according to the latest guidelines of the International Committee of Medical Journal of Editors. All authors were involved in the design and conceptualization of the study. NS conducted the study and drafted the manuscript. NS and PR contributed to the data analysis. All authors were involved in manuscript revisions and read and approved the final manuscript.

Declaration of conflict of interest statement

The authors declare that they have no competing interests

CHAPTER 7. The acceptability and feasibility of a yoga intervention for community mental health consumers: a mixed methods pilot randomised controlled trial

Statement of authorship

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PRINCIPAL AUTHOR

Principal author name:	Nicole Snaith
Contribution to paper:	Developed the research proposal; conducted searches and retrieved papers; conducted all participant interviews; coded, appraised and extracted data; acted as corresponding author; wrote and revised the manuscript based on supervisor and reviewer feedback.
Overall percentage:	80%
Certification:	This paper reports on original research I conducted during the period of my Higher Degree by Research candidature and is not subject to any obligations or contractual agreements with a third party that would constrain its inclusion in this thesis. I am the primary author of this paper

28/06/2021

Signed Date

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By signing the Statement of Authorship, each co-author certifies that:

The candidate's stated contribution to the publication is accurate (as stated above)

Permission is granted for the candidate to include the publication in the thesis; and

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Abstract

Introduction: Yoga-based interventions are increasingly recognised as an adjunct treatment for anxiety and depression, however limited research has examined the role of yoga for anxiety and depression in consumers with a chronic psychosis or mood-based disorder.

Aim: To trial the acceptability and feasibility of a yoga intervention for anxiety and depression with consumers of a Community Mental Health Service.

Method: This was a mixed methods pilot study: a randomised controlled trial. Consumers of a Community Mental Health Service were randomly allocated to the 10-week yoga intervention (n=10) or waitlist control group (n=8). Pre, post and 3-months post intervention mindfulness and mental health measures were collected, and a focus group undertaken.

*Results***:** There were no differences in outcome measures pre- to post-intervention or 3-months for the intervention or control group. Focus group themes included: mental health benefits, lifestyle changes, yoga practice recommendations and future directions.

*Discussion***:** The feasibility of this yoga intervention is unclear, partly due toa high drop-out rate and small sample. Promising qualitative findings were shown in the acceptability of a yoga-intervention and potential behavioural and lifestyle changes.

Implications for Practice: Mental health nurses play a pivotal role in advocating and supporting consumers to access yoga.

Relevance statement

Yoga-based interventions have the potential to work alongside traditional treatment options for anxiety and depression in consumers with a chronic psychosis or mood-based disorder. Mental health nurses play a pivotal role in health education and promotion, and in advocating and supporting consumers to explore alternative treatment options, such as yoga. Findings of this research indicated that consumers want to access, and report benefit from yoga, but are fearful

of stigma and judgement. This research provides a platform for mental health nurses to work with consumers in breaking down the barriers to accessing yoga in the community.

Introduction

Anxiety and depression are common mental health problems with increasing prevalence worldwide (WHO, 2017). Depression is ranked as the single largest contributor to global disability, and anxiety disorders are ranked at 6th (WHO, 2017). Anxiety and depression have a significant impact on individuals and families and are associated with increased disability, reduced quality of life and increased healthcare costs (Cramer et al., 2013).

Yoga-based interventions are increasingly recognised as an adjunct treatment for anxiety (Cramer et al. 2013; Uebelacker and Broughton, 2016) and depression (Cramer et al., 2013; de Manincor, Bensoussan, Smith, Barr et al., 2016). However, limited research has examined the role of yoga for anxiety and depression in people diagnosed with a chronic mental health condition, such as mood or psychosis-based disorders. Symptoms of anxiety and depression may be overlooked in these consumers, with priority given to mental health conditions considered more severe and/or enduring. Yoga may appeal to mental health consumers due to concerns regarding side effects, stigma of taking medication, lack of choice/control and costs of traditional pharmacological therapies (Macy, Jones, Graham & Roach, 2015). However, accessing yoga in the general community may be difficult for this consumer group due to accessibility, costs, anxiety and fear of stigma associated with having a mental health condition. This paper presents a small scale randomised controlled trial and a focus group of consumers who participated in a yoga intervention for mental health. In addition to current research findings, this trial was based on two previous articles where we surveyed yoga teachers and students (Snaith, Schultz, Proeve, & Rasmussen, 2018) and consulted with mental health

consumers, staff and yoga teachers regarding the feasibility and practicability of a yoga intervention for mental health consumers (Snaith, Rasmussen, Schultz, & Proeve, 2020).

The aim of this research project was to test the acceptability and feasibility of a yoga intervention for anxiety and depression with consumers of a community mental health service. Consumers of this service have a diagnosis of a chronic psychosis or mood-based disorder, and those in this study reported experiencing symptoms of anxiety and/or depression. The study investigated the effect of regular yoga practice on psychological measures (Five-facet Mindfulness Questionnaire and Self-Compassion Scale) and mental health outcomes (Depression, Anxiety and Stress Scale, Mental Health Continuum, and the Kessler Psychological Distress Scale), as well as recording consumer experiences through a focus group.

Materials and Methods

Study design

This was a mixed methods pilot study, including a randomised controlled trial with a 10-week yoga intervention group and waitlist control group, and a focus group with consumers of a Community Mental Health Service in metropolitan Adelaide.

The intervention involved a twice-weekly one-hour yoga group (Appendix 13) and home practice for 10 weeks from May-July 2018, followed by a post-yoga course focus group and 3-month follow up in October 2018. The waitlist control group received conventional care through the Community Mental Health Service and were offered the same 10-week yoga course in early 2019.

Trauma informed yoga principles were incorporated into the yoga course, including providing non-hierarchical modifications/options, invitational language and body language (Justice et al., 2018), avoiding triggering terms (eg. the term 'pose') and postures (eg. happy baby, cat-cow). Mindfulness practice was emphasised throughout each class, including focus on 'breath with movement' and frequently reminding students to 'focus back on the breath' when distracted by thoughts, in addition the start and end of the class included specific guided mindfulness practices incorporated with breath-work.

Ethics approval was obtained from the Southern Adelaide Clinical Research Ethics Committee (Approval number 38.17) (Appendix 14).

Safety and risk assessment

A risk assessment of potential safety/adverse effects and mitigating factors/plans was provided as part of the ethics application. The main components of the risk assessment were: explaining the potential adverse emotional or psychological effects during or after yoga practice or through discussions around the experience of anxiety and depression; potential adverse emotional or psychological effects due to difficulty or distress with yoga practice; and potential physical injury during yoga practice.

Outcome measures

Participants of both groups were required to complete the Five Facet Mindfulness Questionnaire (FFMQ), Self-Compassion Scale (SCS), Depression, Anxiety and Stress Scale (DASS), Mental Health Continuum (MHC) and Kessler Psychological Distress Scale (K10+) before ('pre'), immediately after ('post') the 10-week program, and at 3 months follow-up ('3 months').

The FFMQ is a 39-item reliable and validated scale that provides a total mindfulness score and sub-scale scores for five elements of mindfulness, including observing, describing, acting with awareness, non-judging of and non-reactivity to the inner experience (Baer, Smith, Lykins et al., 2008) (Appendix 15).

The 26-item SCS has six sub-scales assessing self-compassion: self-kindness, self-judgement, common humanity, isolation, mindfulness, and over-identification, as well as a total self-compassion (Neff, 2003) (Appendix 16).

The 42-item DASS has been well validated as an effective tool to measure depression, anxiety and stress levels in a range of clinical and non-clinical populations (Antony, Bieling, Cox, Enns, Swinson, 1998). The DASS has three sub-scores measuring depression, anxiety and stress levels, as well as a total score (Appendix 17).

The MHC is a 40-item questionnaire measure of positive mental health (Kessler, Andrews and Colpe et al., 2002) (Appendix 18) and the K10 a 10-item widely used tool for psychological distress (Keyes, 2002) (Appendix 19).

Participant recruitment and randomisation

Flyers (Appendix 20) were placed in the Community Mental Health Service waiting room and interested consumers were assessed for eligibility as per the inclusion/exclusion criteria (Table 12) through consultation with their community mental health team. Consumers were also required to complete a yoga medical clearance from their GP (Appendix 21). To avoid a potential conflict of interest, recruitment and informed consent was conducted by consumers' care co-ordinator or mental health team during their routine visits (Appendix 22). The

consumers' rights were always considered and respected. Participants were randomly allocated to either the intervention or control group by a computer-generated random numbers table using simple randomisation, which was undertaken by author TS.

Focus group

A one-hour focus group with four intervention participants was facilitated by author KH, three weeks after completion of the yoga course. KH is an experienced psychologist and researcher, not involved in the delivery of the intervention. The question guide is included as Appendix 23. Audio recording and note taking describing non-verbal cues occurred during the focus group.

Table 12. Inclusion/exclusion criteria

Inclusion	Exclusion
Registered mental health consumers to a Community Mental Health Service in metropolitan Adelaide who identify with experiencing anxiety and/or depression *Please note consumers registered in this community mental health service also have a diagnosis of a chronic psychosis or a mood-based disorder*	Not a registered mental health consumer or do not identify with experiencing anxiety and/or depression
Able to give informed consent to participate (as determined by their treating mental health team)	Unable to give informed consent
Not experiencing any significant health problems (physical and/or mental), stressors of treatment regimens that may impact on, be affected, or worsened by participation, as determined by their treating mental health team	Experiencing any health problems, stressors or treatment regimes, that may impact on, be affected, or worsened by participation
Medically cleared to participate in yoga by their GP and have completed a yoga registration form of medical history, current health conditions and injuries/limitations and current medication or treatment	Medical clearance not obtained and/or yoga registration form not complete
Inexperienced or minimally experienced in yoga (less than once per week)	Regularly practise yoga (once or more per week)
Not pregnant, as pre-natal yoga requires a specialised tailored program and pre-natal qualified yoga teacher	Pregnant

Data Analysis

Quantitative data were analysed using SPSS (v25, IBM). Descriptive statistics and non-parametric statistical analysis were undertaken due to the small sample sizes. The Wilcoxon signed rank test was used to compare pre- to post-intervention and pre-intervention to 3 months follow-up for FFMQ, SCS, DASS, MHC and K10 measures within the intervention and control group. Significance level was set at $P<0.05$.

The recording of the focus group was transcribed by an external company and thematic analysis undertaken by NS and PR. Braun and Clarke's (2006) six-step thematic analysis process was adopted as follows: 1. becoming familiar with the data, 2. generating initial codes, 3. searching for themes, 4. reviewing themes 5. defining and naming themes and 6. producing the report. Author NS read transcripts several times and generated initial codes and themes. Reviewing, defining, and naming themes was undertaken by NS and PR. The essence of the themes was then defined, discussed, and finalised with all authors.

Results

Participants

Eighteen participants were recruited and randomised, 10 to the intervention and eight to the control group. Six of these participants (two from the intervention, four from the control) dropped out before the study commenced and a further two (both from the intervention) during the study. Participants were designated as completers if they attended 50% of the sessions. Eight participants (four in each group) were completers, although one participant from each group discontinued at 3 months follow-up (Figure 9). All four completers from the intervention group participated in the focus group.

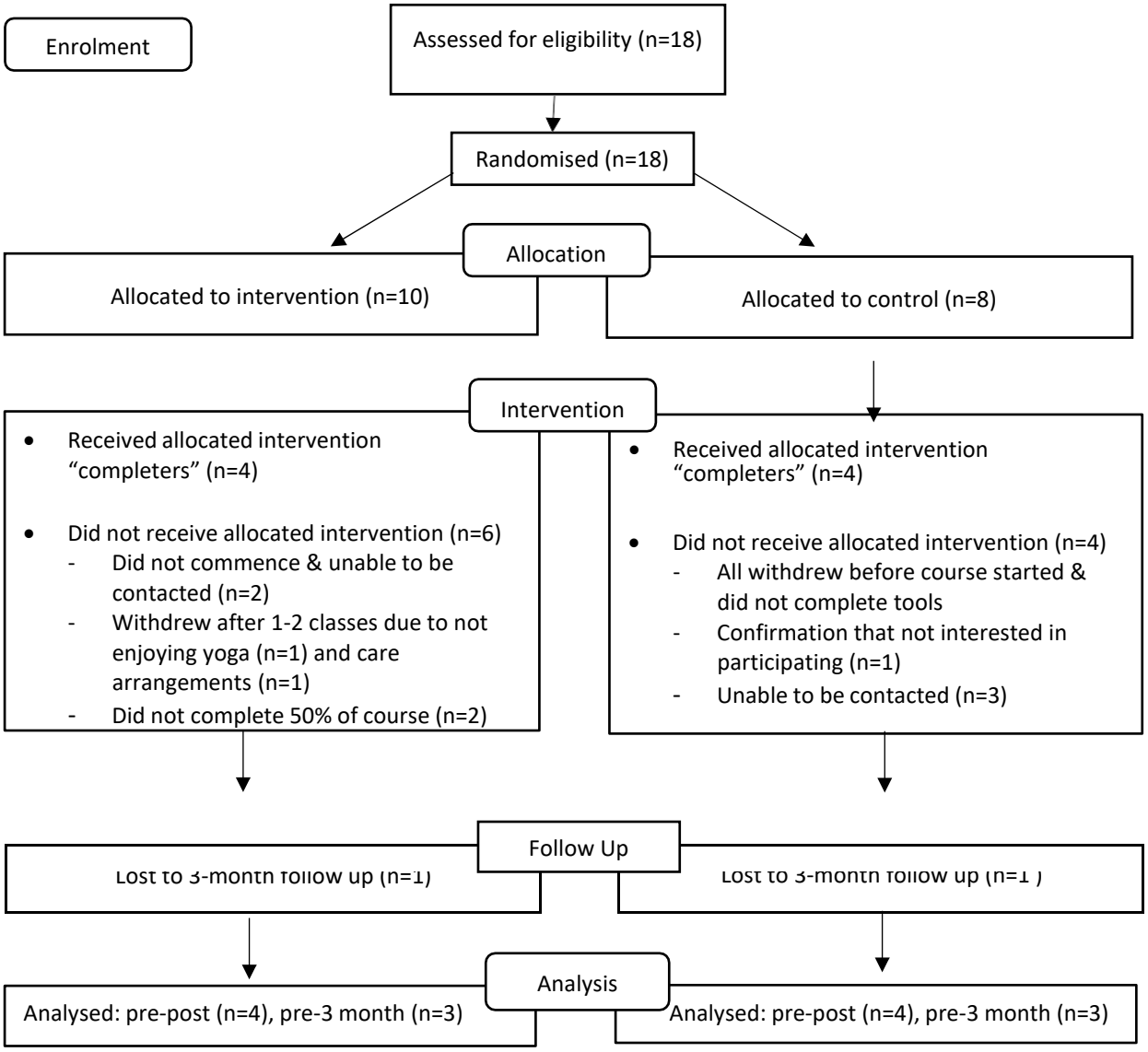

Figure 9. Participant movement in the study

Participants were predominantly female, aged 18-35, and with a diagnosis of Schizophrenia or Schizo-affective Disorder (Table 13). Most participants had some yoga experience, all had mindfulness practice experience, and one had Dialectical Behaviour Therapy (DBT) experience (Table 13).

Outcome measures

There was no difference in the FFMQ, SCS, or the MHC scores pre- compared to post- or pre- to 3 months-post in the intervention or control group (Table 14).

DASS median pre- scores for the intervention group were severe for depression and anxiety and moderate for stress. The DASS median pre- scores for the control group were severe for depression and mild for anxiety and stress. There were no differences in the DASS total or sub-scores pre- compared to post- or post to 3 months in the intervention or control (Table 14).

The median pre- K10 was in the severe distress range for the intervention group and mild distress for the control. There were no differences in the K10 scores pre- compared to post- or pre- to 3 months (Table 14).

Table 13. Demographics of study participants

Variable		Recruited	Intervention 'completers'	Control 'completers'
Gender	Female	13	4	1
	Male	5	0	3
Age	18-25	6	2	1
	26-35	9	2	2
	40-50	3	0	1
Main Diagnosis	Schizophrenia	5	0	3
	Schizo-affective Disorder	5	1	1
	Bipolar Disorder	1	1	0
	Depression	2	1	0
	Borderline Personality Disorder	2	1	0
	Unknown	3	0	0
Yoga experience	Yes	8	3	2
	No	5	1	2
	Unknown	5	0	0
Mindfulness experience	Yes	10	4	4
	No	3	0	0
	Unknown	5	0	0
DBT experience	Yes	4	1	0
	No	9	3	4
	Unknown	5	0	0

Table 14. Pre-post and Pre-3M comparison of FFMQ, SCS, DASS, MHC & K10 for the intervention and control groups

		Pre-			Post-			3 Months			Z	P1	Z	P2
Measure	**Tx**	**n**	**M**	**IQR**	**n**	**M**	**IQR**	**n**	**M**	**IQR**				
FFMQ	I	4	109.5	77.3-112.5	4	94.0	68.3-121.3	3	73.0	56.0-112.0	-0.73	0.63	-1.07	0.50
	C	4	118.0	109.3-128.3	4	117.5	101.0-125.8	3	118.0	117.0-119.0	-1.07	0.75	-0.82	0.75
SCS	I	4	52.5	41.0-79.0	4	58.0	35.0-75.5	3	49.0	27.0-64.0	-0.55	0.75	0.00	1.00
	C	4	59.5	53.8-75.0	4	63.5	55.5-83.5	3	72.0	60.0-95.0	-1.29	0.38	-1.61	0.25
DASS	I	4	73.0	48.5-78.0	4	74.0	56.5-84.8	3	86.0	68.0-102.0	-1.29	0.50	-1.07	0.50
	C	4	51.5	29.3-70.0	4	54.5	25.8-72.0	3	46.0	17.0-82.0	-0.37	0.88	-0.27	1.0
Depression	I	4	26.0	14.0-39.5	4	29.0	18.5-40.3	3	34.0	21.0-42.0	-1.63	0.25	-1.34	0.50
	C	4	21.5	12.8-30.3	4	20.0	12.3-31.5	3	19.0	10.0-27.0	-0.27	1.00	-0.82	0.75
Anxiety	I	4	16.0	15.3-24.3	4	20.0	15.3-22.5	3	26.0	19.0-28.0	-0.18	1.00	-1.07	0.50
	C	4	7.5	5.0-22.0	4	6.0	4.3-24.3	3	4.0	2.0-33.0	0.00	1.00	0.00	1.00
Stress	I	4	20.5	15.5-28.5	4	23.0	22.3-24.5	3	28.0	26.0-32.0	-0.73	0.63	-1.07	0.50
	C	4	18.0	4.3-29.5	4	21.0	5.3-27.8	3	17.0	3.0-30.0	0.00	1.00	-0.82	0.75

		Pre-			Post-			3 Months			Z	P1	Z	P2
Measure	**Tx**	**n**	**M**	**IQR**	**n**	**M**	**IQR**	**n**	**M**	**IQR**				
MHC	I	4	22.0	1.5-48.5	4	24.5	2.5-51.8	3	8.0	0.0-28.0	-0.54	0.75	-0.45	1.00
	C	4	25.0	22.5-37.3	4	25.0	20.8-35.3	3	37.0	17.0-39.0	-0.74	0.63	0.00	1.00
K10	I	4	31.5	26.23-41.3	4	30.0	24.5-40.0	3	36.0	25.0-45.0	-1.86	0.13	0.00	1.00
	C	4	22.0	12.8-33.5	4	22.5	22.5-36.8	3	21.0	15.0-32.0	-1.30	0.34	-0.27	1.00

P1= Pre-post comparison; P2= Pre-3-month comparison I= Intervention, C= Control, n=sample size,

M=median, IQR=Interquartile range, Z= Z-score

Focus group

The four themes derived from the focus group were: Mental health benefits, Lifestyle changes, Yoga practice recommendations and Future directions (Table 15). Each theme has 1-4 sub-themes and are discussed below.

Table 15. Focus group themes and sub-themes

Theme	Sub-theme
Mental health benefits	You're a bit lighter but in a mental sense
	It's like you've got this energy around you
	Feeling good about yourself when you do the yoga
Lifestyle changes	It's the lifestyle you take home
	Physical health benefits
Yoga practice recommendations	Welcoming and calming
	Practice characteristics
	Just be in the present moment
	It's amazing just what a couple of minutes of your time can do
Future directions	It's less of a judgemental environment

Mental health benefits

Most participants reported mental health benefits from yoga practice, including improvements in symptoms of anxiety and depression, spiritual effects and self-compassion.

Sub-theme: You're a bit lighter but in a mental sense.

Some participants described a general change in their mental health. For example, one described: 'I think I noticed a difference mentally… you're a bit lighter, but … in a mental sense' (3). Others reported specific benefits for anxiety and depression: 'The important part for

me was the breathing practices and helping to lessen anxiety and also in terms of depression making myself do some yoga' (4). Similarly, another stated 'I found it helpful just having to get up and go there was the motivation, rather than stay in bed all day' (1). Specific elements of yoga including breath work and the motivational aspects of committing to the class were identified as beneficial for anxiety and depression.

Sub-theme: It's like you've got this energy around you.

Some participants described spiritual effects or changes in their metaphysical energy. One participant explained, '… it created some type of energy around me that was different than before' (1). Similarly, participants 2 and 3 spoke of feeling a change in their 'vibration' and 'frequencies'. These spiritual experiences were viewed positively and linked to changes in participants' mental and emotional health.

Sub-theme: Feeling good about yourself when you do the yoga.

Self-compassion was highlighted as a benefit of yoga by participants. One participant explained: 'I think that's kind of – bringing it back to the self-compassion thing and feeling good about yourself" (2). Yoga was viewed as a mechanism for improving self-compassion and in turn beneficial for mental health.

Lifestyle changes

Positive lifestyle changes, including the routine of attending regular yoga classes, self-care, improved sleep and physical health was highlighted by participants.

Sub-theme: It's the lifestyle you take home

Yoga was viewed as having multi-faceted lifestyle benefits beyond the classroom. One

participant summarised as follows: ‘It's the lifestyle that you take home, not just the exercises. … the breathing and the stretches and everything that makes yoga’ (3).

The motivation to attend yoga classes had a positive impact on participants’ weekly routine. One participant explained: ‘I think the routine of just having those two days … and that hour set aside for yoga … writing that in my diary … and keep that commitment’ (4). Participants described feeling a sense of achievement by committing to the twice-weekly yoga classes. Mostparticipants also considered yoga as a time they could commit to themselves. For example, one participant explained: ‘… the routine was good for me ... a set time and you knew that … between this time I'm off the clock ... just taking this time for me … everything else I'll worry about once the hour is up’ (3). (Participants 2 and 4 agreed). Yoga was viewed as a break from everyday life and stressors, a time for self-care.

Sub-theme: Physical health benefits

Improved sleep was attributed to yoga practice for some participants. For example, one participant explained: ‘So it would change my sleep at night … I would be nice and relaxed and easily grounded’ (1).

The positive impact of yoga on some physical side effects of medication was spoken about by another participant:

> Sometimes I shake because of the medication I'm on and the balancing [postures] I wasn't shaking at all and was able to actually centre myself and be in that very moment and balance. So I found that had a positive impact on that. All these things I didn't think had a cure, like the shaking with my medication, and [this was a way] of doing it. It's pretty amazing actually (1).

Yoga practice recommendations

Participants made recommendations regarding the class environment, practice characteristics, meditation, mindfulness and breath work and home practice.

Sub-theme: Welcoming and calming

The class environment was identified by all as important, including physical features of the room, teacher, atmosphere, and class size. Participants spoke positively about the physical features of the yoga room, including music, salt lamps, singing bowl and mandalas hung on the wall. For example, one participant described the physical environment as follows: 'the ambience was really nice. And the music and everything that she brought because she transformed it' (3). Participant 2 agreed and continued 'Yeah, it turned from a classroom to… a little world'. The sensory additions to the room were thought to create an atmosphere conducive to yoga practice.

A calm welcoming teacher and environment was particularly beneficial for people experiencing anxiety and depression. The teacher's persona and atmosphere were highlighted as important. For example, one participant said: '…Nicole was so welcoming and calming. Depression can sometimes put up those walls … but Nicole made it a really open and honest place to go into where you just felt okay' (1).

The small size of the yoga class was regarded positively by all participants. Larger classes were considered overwhelming and intimidating, and likely to increase or trigger anxiety. One participant explained: 'I think that's why this worked so well, … it was small and it wasn't confronting' (2). Participant 4 agreed and continued 'If it's a big class and just the thought of it sends my anxiety through the roof'.

There were also some challenges identified with disturbances. One participant explained: ‘There were just things that came up in the environment that made it harder … people being in the corridor outside the door and ... jack hammering. So it was factors that you can't control’ (3). However, participants acknowledged that the external environmental factors were only occasional and were minimised by the sensory features, such as music within the room.

Sub-theme: Practice characteristics

Participants identified specific class components, for example ‘child’s pose’, as beneficial for their mental health: ‘I guess it's just like a spoonful of honey; it dissolves everything’ (2). Similarly, when asked the perceived mental health benefits of child’s pose another explained: ‘It's soothing, maybe anxiety (sic) because when you're in that position it's almost like you're hugging yourself’ (3).

Modifications and encouragement of personal adjustments to postures were highlighted as helpful by participants. For example, one participant described:

> I found it really beneficial that Nicole would use … different types of positions we can use to make ourselves more comfortable … there was no judgement or anything … everyone was there for the same thing and she would give us different routines and different positions that would be a little bit easier for us … didn't need to feel like we had to be advanced (1).

The slow pace and relaxation style of yoga was described as positive and beneficial: ‘I like the slow pace style and the relaxation of yoga … and it's meditative and I just find … it's good for me’ (4). However, one participant spoke of the pace of the yoga class being too slow for her.

The affirmations read by the teacher at the end of class were viewed as a valuable part of the practice. One participant described: ‘Right at the end when you do the salutations, like the namaste, Nicole reads some affirmations and it brings it back to yourself’ (2). Similarly, Participant 1 affirmed: ‘It's really beautiful … quite a lot about happiness and peace and calmness” (1) (Participant 3 agreed).

Sub-theme: Just be in the present moment

Meditation and breath-work were emphasised as important components of yoga practice and were often both described in terms of mindfulness practice. Participants described the meditation time as relaxing, peaceful and a time to be focused on the ‘present moment’. For example:

> I loved the beginning and the end where you just sit … it's almost like a weight is lifted off my shoulders. That's my favourite bit … we just lie on our backs and look at the ceiling, put our legs up on a bolster and just be in the present moment. It's really peaceful … I even do that at home now (1).

Breath-work was also viewed positively and as a time ‘to be present’. One participant explained: ‘I liked the breathing at the start … just to be present and focus on the breathing side of things’ (4). Another touched on the more specific physiological benefits of breath-work:‘It calms your nervous system … it's not necessarily the yoga that we take home; it's the different aspects from it, like the breath-work and the meditation’ (2).

Sub-theme: It’s amazing what just a couple of minutes of your time can do

Home practice was identified as beneficial by most, whether as a full practice or specific components. One participant described:

> I did find the home practice beneficial, putting a pillow under my leg … [lying] down on my bed … looking up at my ceiling … it kind of took me back to thinking … I was in yoga class … It's amazing what just a couple of minutes of your time can do, from going into anxiety or a manic fit (1).

However, some found home practice difficult due to not knowing what to do or how to do it or not feeling motivated. Participants acknowledged they were given a folder of different yoga practices to do at home but suggested as an improvement to the course that a CD or recording would have been helpful in committing to a home practice.

Future directions

Participants were disappointed that the yoga course was finishing and discussed the difficulties around accessing yoga in the general community. Some of the issues raised include cost, access, large class sizes and the yoga practice being too advanced or unfamiliar.

Sub-theme: It’s less of a judgemental environment

All participants agreed that there should be an ongoing yoga class offered specifically to mental health consumers. One participant rationalised:

> If we were to go to a gym and do a yoga class and there weren't necessarily modifications, or it was more like an advanced beginner … I think it would just heighten the anxiety you feel in yourself. But because we're all here for the same reason, and going through something it's less of a judgemental environment (2).

Participants suggested that yoga aimed specifically for mental health consumers and undertaken with peers would lessen anxiety and other barriers to accessing yoga in the community.

Discussion

Results of the quantitative outcome measures and effectiveness of the yoga intervention are unclear, partly due to a high attrition rate and small sample size. However, findings of the qualitative results for the four participants are consistent with the growing research evidence indicating that yoga is a well-accepted intervention for anxiety (Annapoorna et al., 2011) and depression symptoms (de Manincor et al., 2016; Sharma et al., 2005). Interestingly, the commitment to attending yoga classes was consistently emphasised as positive for symptoms of depression, including improving motivation, self-care and providing some structure to weekly routine. Similarly, participants in a qualitative study on the experience of yoga on Bipolar Affective Disorder (Uebelacker et al., 2014) reported behavioural changes such as yoga helping them to 'get out of bed' (page 349). Although not reinforced by the quantitative results in this study, the potential lifestyle and behavioural changes facilitated by yoga are important findings indicating yoga could be a valuable therapy for anxiety and depression.

Meditation, mindfulness practices and breath-work were consistently highlighted as beneficial by participants. The qualitative results are consistent with other research that recognises the role of mindfulness in facilitating the positive effects on anxiety and depression in yoga (Salmon et al., 2009; Brisbon and Lowery, 2011; Evans et al., 2011, Knight et al., 2014) and benefits of breath-work for anxiety (Janakiramaiah et al., 2000; Rohini et al., 2000; Brown and Gerbarg 2005; de Manincor et al., 2015). Interestingly, increased self-compassion was also identified in the focus group, although not supported by the quantitative results.

Self-compassion is similarly a significant contributor to positive mental health outcomes reported for anxiety and depression in structured mindfulness-based programs (Baer et al., 2012; Van Dam et al., 2011); but has not been well researched in yoga. The qualitative results are promising and reinforce the importance of meditation, mindfulness practices and breath-work in designing a yoga intervention for mental health consumers.

Creating a calm and welcoming atmosphere, small class size, providing modifications and slow pace of yoga were recommendations reported by Snaith et al., (2020). These recommendations are also consistent with trauma-informed yoga research (Justice, Brems, & Ehlers, 2018), which has emerged from recommendations from trauma-informed care within current mental health services (Emerson et al., 2009). The spiritual effects of yoga reported by participants was an interesting finding that has not been well researched. Uebelacker et al.'s (2014) qualitative study similarly reported spiritual effects of yoga by participants. One of the problems identified in undertaking yoga research is that it is difficult to measure and quantify the experience of yoga. This study has strengthened the evidence for further qualitative research and exploring the spiritual and lived experiences of yoga.

The feasibility of yoga as an intervention was limited by difficulty with retention and follow up of participants. The nature of the consumer group, including experiences of life stressors, mental health relapse and symptoms, may have impacted on retention, as well as quantitative outcomes. The consequent small sample size (n=4) of the qualitative component of the pilot study may not have been an accurate representation of the consumer's voice. A larger sample size may have yielded different findings in both the qualitative and quantitative components of the study, and therefore the small sample size is a limitation of the study.

Furthermore, the yoga course attendance expectations of two classes per week may have been too great for some consumers. Providing the option to attend the same yoga class once or twice per week over a longer time (six months) may have improved overall attendance and reduced the negative impact of sudden life stressors on retention.

Other limitations of the study include that the treatment groups were slightly different according to gender at baseline, with the control group having more males and the intervention group being mostly female. Participants and outcome assessors were unable to be blinded to the treatment they were assigned, as they were aware if they were in the yoga intervention group or not.

Conclusion

The effectiveness of this yoga intervention is unclear, partly due to a high drop-out rate and small sample size. Focus group results are promising and indicate acceptability of a yoga intervention for anxiety and depression in consumers with a primary mood-based disorder. The potential lifestyle and behavioural changes facilitated by yoga are also important findings indicating yoga could be a valuable therapy for anxiety and depression in this consumer group. Findings also suggest that self-reporting through a focus group may be more suitable and yield more in-depth results than questionnaires for this cohort of consumers. However, the feasibility of yoga as a large-scale intervention is questionable due to the challenges experienced with retention. Future studies may benefit fromreducing attendance requirements to one yoga class per week and offering the course over a longer period. Further qualitative research examining the role of mindfulness, self-compassion, and the spiritual effects of yoga on symptoms of anxiety and depression, including behavioural and lifestyle changes, may strengthen the evidence for integrating yoga into mental health care.

Implications for practice

Qualitative findings of this research have shown that some mental health consumers want to access yoga and report benefit for their mental health but have either had a difficult experience in a community-based yoga class or are fearful of this occurring. The fear of perceived stigma and judgement, management of symptoms, and side-effects in class, feeling unsafe and experiencing triggers from the environment and/or class components, were all concerns raised in the focus groups. Recommendations from this research include that mental health nurses support and advocate for consumers' wishes to pursue alternative therapies such as trauma-informed yoga as part of their care and treatment. Specific roles may include discussing and providing information on yoga and the potential benefits with consumers and/or their treating team, providing information on local yoga classes, and supporting and attending yoga classes with consumers to reduce fear and anxieties.

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Author confirmation statement

Authors NS, TS, PR & MP were involved in the conception, design, analysis and interpretation of data. NS facilitated participant recruitment, collection of data and delivery of the intervention. KH facilitated the focus group. All authors were involved in drafting of the paper,

revising and final approval of the submitted version.

Author disclosure statement

All authors declare that they have no competing financial interests. NS is employed as a Registered Mental Health Nurse and KH employed as a Psychologist by SALHN, both in separate roles to this study.

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CHAPTER 8: Discussion

The main aim of this research project was to design and evaluate the acceptability and feasibility of a yoga intervention for consumers with a chronic psychosis or mood-based mental health condition, as well as self-reported anxiety and depression. This main aim was informed by the other aims of examining the role of yoga in improving mindfulness and self-compassion, and determining if there are relationships between mindfulness and self-compassion and mental health outcomes including stress, depression, anxiety and well-being. The final aim of the study was to provide recommendations for future health care delivery and specific strategies for nursing practice. There were four research questions, which are considered in the discussion.

The research was undertaken over four phases, with each phase informing the consequent phase, and all leading to the development of the final pilot study. The initial phase of the research was the literature review and model development which provided background information on the potential biological, physiological and psychological mechanisms of change facilitated by yoga for anxiety and depression, existing research and limitations and gaps in the literature. Phase 2 surveys of South Australian yoga teachers and students was then developed to explore characteristics and factors of yoga practice that may influence mindfulness, self-compassion, depression and anxiety levels. This information was then considered in designing the focus group questions for phase 3, which involved focus groups with mental health consumers and staff, and interviews with yoga teachers. Questions were asked about the feasibility and appropriateness of a range of yoga practice features (identified in phase 2) to be tested as a yoga intervention for consumers of a mental health service. Phase 4, the pilot yoga intervention was then developed based on the information gained in the three preceding phases and existing research on trauma informed yoga, particular in regard to yoga practice characteristics, class environment, teacher experience and knowledge.

Mindfulness and self-compassion

The relationship between mindfulness and self-compassion has not been well-researched in the context of yoga, which is the focus of this research project. In contrast to established mindfulness programmes such as MBSR and MBCT, yoga-based interventions may arguably not have such a clear link to increased mindfulness and/or self-compassion levels. This is explored further in the first two research questions concerning the outcomes of mindfulness and self-compassion:

- Is there a relationship between mindfulness and self-compassion levels?
- Do mindfulness and self-compassion levels improve with regular yoga practice, and are there any relationships to mental health outcomes for stress, depression, anxiety, and wellbeing?

Since the development of these research questions in 2012, the relationship between mindfulness and self-compassion levels has been well-evidenced in the literature (Bluth and Blanton, 2014, Raab, 2014). Findings of Phase 2 support the evidence in regard to yoga, similarly reporting a positive correlation between mindfulness and self-compassion levels for both yoga teachers and students (Snaith et al., 2018).

The role of mindfulness in facilitating the positive effects of yoga on anxiety and depression was highlighted throughout the research project and is consistent with other research (Salmon et al., 2009; Brisbon and Lowery 2011; Evans et al., 2011; Roche et al., 2016). Findings of Phase 2 (Snaith et al., 2018) showed a negative correlation for mindfulness and self-compassion with DASS scores in a general community sample of yoga participants. Therewas also a positive correlation between yoga experience and mindfulness and self-compassion, suggesting an

increase over time with yoga practice. Interestingly, mindfulness is oftenconsidered the 'active ingredient' in yoga and linked to reported positive effects on anxiety anddepression (Brisbon & Lowery, 2011; Knight et al., 2014; Salmon et al., 2009). In essence, thepractice of yoga requires participants to be fully present and engaged in the moment, which isfacilitated by the focus on breathing and synchrony with movement.

Participants in Phase 3 (Snaith et al., 2020) and Phase 4 (Snaith et al., 2021, *article submitted*) focus groups considered mindfulness to be an important component of yoga practice. The role of self-compassion needs further research but in initial findings participants felt that their self-compassion improved with yoga practice, which is broadly consistent with findings from structured mindfulness-based programs which identify self-compassion as a significant contributor to positive mental health outcomes reported for anxiety and depression (Baer et al., 2012; Foroughi, Sadeghi & Parvizifard… et al., 2019; Sevel, Finn & Smith… et al., 2019).

Yoga practice components

There was one research question relating to yoga practice components: Are there components of yoga practice (home practice, class frequency, class length, meditation and practice experience) that are associated with improved mindfulness and self-compassion levels, and mental health outcomes? It is important to note that while these measures were taken in a community setting, the aim was to adapt these findings to a mental health population.

Yoga teacher and student survey findings indicated that yoga practice frequency with a minimum of two classes per week, home practice, and meditation practice were important factors, as they were associated with increased mindfulness and reduced anxiety and depression scores, which is consistent with previous research (Sherman, et al., 2012; Ueblacker, et al.,

2016). Interestingly, a minimum of two classes per week is suggested in the literature for general yoga practice in the community (Penman et al., 2012), as well as for developing yoga interventions for research (Sherman et al., 2012). This is most likely to facilitate developing a routine and consistent regular yoga practice. Other studies have similarly found a positive correlation with regular meditation practice and mindfulness scores (Baer et al., 2012). It is well established in the literature that long-term practice of meditation fosters mindfulness skills and in turn these skills promote psychological well-being (Kabat-Zinn, 2003; Walsh & Shapiro, 2006).

Other components of yoga practice were deemed important for mental health consumers from qualitative data collection in Phases 3 and 4. Breath-work and mindfulness practices were emphasised as important by participants throughout the research project. This is consistent with the literature, which identifies breath-work (Brown & Gerbarg, 2005; de Manincor et al., 2015) and mindfulness (Evans et al., 2011; Uebelacker & Broughton 2016) as key components of yoga for people with anxiety and depression. Pranayama or yoga breath-work is considered a powerful tool to control breathing patterns and influence the autonomic nervous system, stress response and emotional state (Brown & Gerbarg, 2005), which is described in detail through the yoga and mental health model developed in Butterfield et al., (2017).

Yoga for anxiety and depression

There was one research question relating to the effectiveness of yoga on anxiety and depression: Is a yoga intervention for mental health consumers with anxiety and depression effective in increasing mindfulness and self-compassion and reducing stress, anxiety and depression symptoms?

The effectiveness of the yoga intervention on increasing mindfulness and self-compassion levels, and reducing stress, anxiety and depression symptoms in this cohort of consumers remains inconclusive. The small sample size and high drop-out rates in the pilot study impacted on its findings and the study validity, and a further pilot study and then larger scale RCT is needed to fully explore this research question. However, this pilot study demonstrated high acceptability of yoga-based interventions for this cohort of consumers. This is consistent with the growing research evidence indicating that yoga is a well-accepted intervention for anxiety (Annapoorna et al., 2011) and depression (de Manincor et al., 2016; Sharma et al., 2005). Interestingly, in the qualitative analysis of the pilot study, participants emphasised that they initiated behavioural changes, including improved motivation and self-care, and the provision of some structure to their weekly routine, as benefits of yoga for symptoms of depression. The potential lifestyle and behavioural changes facilitated by yoga are important findings indicating yoga could be a valuable therapy for depression. The spiritual effects of yoga reported by mental health consumers was also a noteworthy finding that has not been well-researched and warrants further investigation.

Trauma-informed yoga

Trauma-informed approaches to yoga teaching and practice were strong recommendations from the consultation (Snaith et al., 2020) and qualitative analysis of the pilot study (Snaith et al., 2021, *article submitted*), which is consistent with trauma-informed yoga research(Justice, Brems, & Ehlers, 2018). Trauma history is particularly prevalent in mental health populations (Butler, Critelli & Rinfrette 2011). Some studies suggest that as many as nine out of 10 people accessing mental health services have experienced trauma at some stage in their life (Mueser, Salyers & Rosenberg 2004; Trickett, Noll & Putnam 2011), and often experience repeated trauma throughout their lifetime (Rosenburg 2011). Trauma-informed yoga is a growing

specialised field that has emerged from recommendations of trauma-informed care within current mental health services (Emerson et al., 2009). The identified trauma-informed components included providing information well in advance of the yoga course; a calm, quiet and private space; slow and guided practice; avoiding potential triggering postures (e.g. cat-cow sequence or happy baby) and including modifications (e.g. 'child's pose' or 'puppy' instead of 'down dog'). A proposed addition to the yoga mental health model developed in Butterfield et al., 2017, to include trauma-informed yoga approaches is recommended from these research findings (Figure 10).

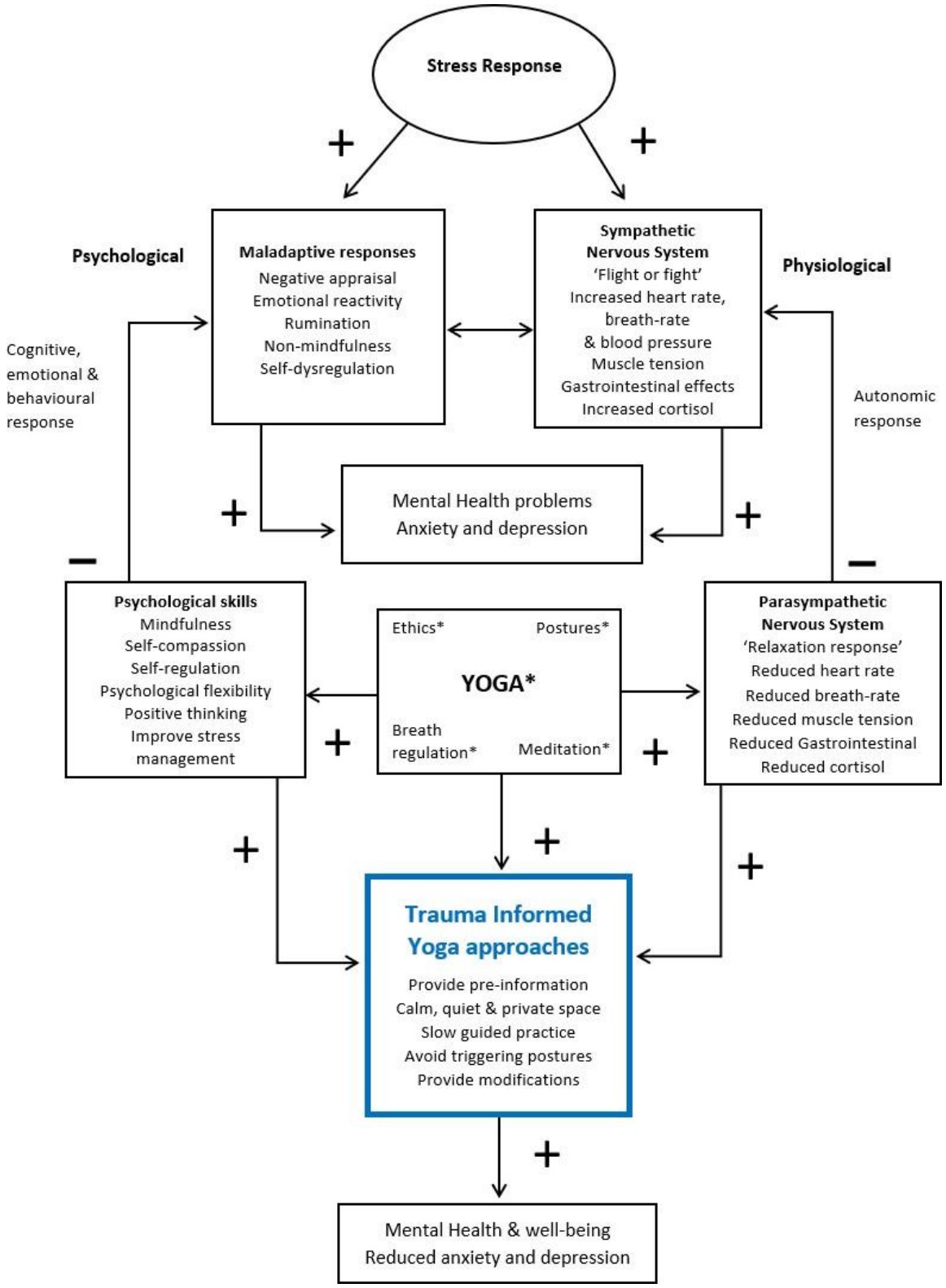

Figure 10. The new proposed Yoga and Mental Health Model, including the addition of trauma-informed yoga approaches

Limitations

Yoga-based research with this consumer group was challenging due to difficulties with recruitment and retention, attendance and follow-up. This is not surprising due to factors such as relapse of mental health, life stressors, and the impact of positive (e.g. auditory hallucinations) and negative (e.g. withdrawal/social isolation, low motivation, poor self-care) symptoms. Recruitment was difficult for both Phases 3 and 4, partially due to reliance on mental health professionals, with busy schedules, to discuss the study with consumers and undertake the consent signing process. This may have limited participant numbers and also caused bias towards particular consumers whose mental health worker had an interest in the study. Furthermore, the recruitment involved only one community mental health site over a two-month period, which may have limited the number of consumers reached and opportunities for consumers to learn about the study.

A trial protocol for the RCT (Phase 4) was not prospectively registered, which introduces the risk of selective reporting bias, and is a limitation. The treatment groups were slightly different according to gender at baseline, with the control group having more males and the intervention group being mostly female. Participants and outcome assessors were unable to be blinded to the treatment assignment. The small sample size (n=4) of the qualitative component of the pilot study may not have represented the consumers voice adequately. A larger sample size may have yielded different findings in both the qualitative and quantitative components of the study.

The low retention rate of the pilot study (Phase 4) is a limitation of the research project. The low retention rate was caused by consumers withdrawing before the study commenced (n=6) or during the study (n=2), or not meeting the 50% required attendance at yoga classes (n=2). Additionally, it was not always possible to contact participants to complete evaluation

measures for the 3-month follow-up. Nevertheless, it is important to note that of those participants that did not meet the 50% attendance requirements, some attended several yoga classes over the 10 weeks, while others attended regularly, but only for the first few weeks. As mentioned, attendance was impacted by individual circumstances such as worsening of symptoms and life stressors. The number, length and frequency of tools to complete, and the expectation of attending two classes per week may have also had an impact on retention.

Recommendations for nursing practice, health care professionals and the health care system

Findings of this research project indicate that yoga-based interventions are well-accepted by this group of consumers and have potential as adjunct or combination treatment options with usual care for mental health care into the future. Yoga offers consumers more choice and control and may empower them to become more proactive in their own care and treatment. With further research into the benefits of yoga for anxiety and depression, as well as other specific mental health conditions, yoga may become more at the forefront of mental health care.

Recommendations for nursing practice and other health care professionals include supporting and advocating for consumers' wishes to pursue yoga as part of their care and treatment. Furthermore, completing training in components of yoga including mindfulness, meditation and breath-work would provide health care professionals with the skills and confidence to facilitate and recommend these practices with individual consumers or in groups.

Recommendations for the health care system include employing trauma-informed and mental health-trained yoga teachers to facilitate yoga classes with the assistance of a mental health professional for consumers in hospital and community settings, and funding further research into yoga for anxiety and depression in mental health consumers. Qualitative findings of this

research have shown that some mental health consumers want to access yoga but have either had a difficult experience in a community-based yoga class or are fearful of this occurring. The fear of perceived stigma, management of symptoms in class, feeling unsafe and experiencing triggers from the environment and/or class components, were all concerns raised in the focus groups.

Future research

Future research recommendations are to undertake another pilot trial to further evaluate the feasibility of implementing a full-scale trial of a yoga intervention for mental health consumers with anxiety and depression.

There are factors to consider for future research including how to increase recruitment and retention, and encourage and facilitate regular participation. Recruitment recommendations include a dedicated person to undertake recruitment, undertaking over several mental health sites to reach a larger cohort of consumers, and over a longer period of 3-4 months with more opportunity for consumer and staff information sessions. Recommendations to improve retention include: running the yoga intervention over a longer period of time to give more opportunity for consumers to attend the minimum required number of yoga classes to account for relapse or personal stressors. Additionally, offering identical yoga classes 2-3 times per week but only requiring attendance at one may be less overwhelming and more achievable for consumers, and improve retention.

The other consideration is what type of data collection and research methods may be most appropriate for this consumer group. The length, number and frequency of tools required completing pre-, post- and at the 3-month follow-up may have been overwhelming for participants and impacted on completion rates. In contrast, self-reporting through the focus

group yielded in-depth discussion on the usefulness and acceptability of the intervention for this cohort of consumers. Although a lot of promising information on the usefulness and acceptability of yoga was gained from the qualitative components of the study, (and conversely the quantitative data did not show effectiveness), the small sample size of this study and low retention rate impacted the validity of the quantitative results. Therefore, a full-scale mixed methods RCT with both quantitative and qualitative elements is recommended to provide a complete picture of the role of yoga in managing symptoms of anxiety and depression in this consumer group. Reduction in the number, length and frequency of tools may be important to improve completion rates and retention to the study. Further examining the role of mindfulness, self-compassion, and the spiritual effects of yoga on symptoms of anxiety and depression, including behavioural and lifestyle changes, are important future research directions. Additionally, exploring implications for health-care utilisation, such as reduced emergency department presentations, and community mental health team contacts would be valuable.

Conclusions

This research project has provided important findings on the design, acceptability and feasibility of a yoga intervention for mental health consumers with anxiety and depression. First and foremost, a yoga intervention for this population should be based on a trauma-informed approach, incorporating the provision of participant information well in advance of the course; a calm, private yoga space; facilitating slow, guided practice and avoiding triggering postures. Secondly, yoga teachers need to have mental health awareness and understanding, and be able to confidently support and work with consumers. Future larger scaled research with protocol changes to improve recruitment and retention is needed to examine the effectiveness of yoga-based intervention on mental health outcomes for this consumer group. The human experience of yoga, including facilitating behavioural and

lifestyle changes, are valuable findings of this research which also warrant further investigation. Ultimately, training yoga teachers to deliver trauma-informed mental health aware yoga classes would be ideal for the long-term sustainable future of integrating yoga into mental health care.

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APPENDICES

Appendix 1. Published Paper 1

Yoga and mindfulness for anxiety and depression and the role of mental health professionals: a literature review

Nicole Butterfield, Tim Schultz, Philippa Rasmussen and Michael Proeve

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Abstract

Purpose – *The purpose of this paper is to examine the role of yoga in the management of anxiety and depression, development of mindfulness and self-compassion and implications for mental health care delivery and mental health professionals, with a specific focus on nursing practice.*

Design/methodology/approach – *A search of electronic databases Scopus, CINAHL, EMBASE, Medline and Cochrane Library was undertaken.*

Findings – *There is growing research evidence supporting the use of yoga as an adjunct or combination therapy for the management of stress, anxiety and depression. Mindfulness has been indicated as a potential mechanism of change but needs further research. Health care professionals may play an important role in supporting consumers to engage in yoga as part of their mental health care.*

Research limitations/implications – *Yoga research to date has been limited by methodological weaknesses including wide variation of yoga practices, styles and teaching methods; difficulties in double-blinding, suitable placebo-control; lack of randomised controlled trials and small sample sizes. The literature highlights that more high-quality yoga and mental health research is needed.*

Practical implications – *The paper introduces the potential role of yoga for anxiety and depression in the health care system and the role of mental health professionals in implementing and promoting holistic yoga-based therapies.*

Originality/value – *This paper proposes a yoga model for mental health and provides insight into a proposed new direction for future mental health care and the role of nursing practice and other mental health professionals.*

Keywords *Anxiety, Depression, Mindfulness, Yoga, Mental health nursing*

Paper type *Literature review*

Introduction

Anxiety and depression are significant mental health problems in Australia and other parts of the world (Louie, 2014; Pilkington *et al.*, 2005; Smith *et al.*, 2007). In 2011, mood disorders (9.7 per cent) and anxiety (3.8 per cent), were the most prevalent mental health conditions in Australia (Australian Bureau of Statistics, 2012). The World Health Organization reports that one in five people will experience depression at some time in their life and estimates that depression will be the world's leading health problem by 2020 (World Health Organisation, 2012).

Depression and anxiety can have a significant impact on individuals and families and are associated with increased disability, reduced quality of life and increased health care costs (Cramer *et al.*, 2013). Stress, anxiety and depression are closely linked, as stress may precipitate or exacerbate symptoms of depression and anxiety and depression may cause acute or chronic stress (Kinser *et al.*, 2012). Exposure to prolonged stress can have a cumulative effect on the body causing chronic over stimulation of the sympathetic nervous system and lead to reduced coping capacity and poorer long-term physical and psychological health (Kinser *et al.*, 2012).

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Environmental, personality and genetic factors may all play a role in the development of stress, depression and anxiety (Kinser *et al.*, 2012).

Pharmacological treatments, psychological therapies, electro-convulsive therapy, complementary and lifestyle programmes and combinations of these interventions are conventional treatments for depression and anxiety (De Manincor *et al.*, 2015; Henderson, 2002; Uebelacker *et al.*, 2010a). However, there are significant concerns of side effects, individual choice, compliance, effectiveness, stigma, access to services, cost effectiveness, ethics and long-term benefits of some of these treatments (De Manincor *et al.*, 2015). The stigma experienced with mental health problems and the limitations of conventional treatments such as side effects, effectiveness, access and cost, have led to people seeking alternatives to mainstream approaches (De Manincor *et al.*, 2015; Henderson, 2002). Mindfulness-based and holistic mind-body therapies are increasing being adopted for the management of anxiety and depression (Pilkington *et al.*, 2005; Uebelacker *et al.*, 2010b).

Yoga is increasingly being recognised as an effective intervention for a range of mental and physical health conditions (Brown and Gerbarg, 2005; Field, 2011). An ancient tradition developed in India over 5,000 years ago, yoga is based on a holistic health system that incorporates mind, breath and body as well as spiritual, ethical and lifestyle factors (De Manincor *et al.*, 2015; Rao *et al.*, 2013). Mindfulness is thought to play an important role in the mental health benefits of yoga; however, the exact mechanism is not well understood and may be a combination of biological, physiological and psychological processes (Da Silva *et al.*, 2009; Field, 2011). This literature review examines the research on yoga for anxiety and depression, potential mechanisms of change including the role of mindfulness and self-compassion and implications for health care professionals.

Methods

An electronic literature search was undertaken using Scopus, CINAHL, EMBASE, Medline and Cochrane Library databases for papers from 2000 to 2015. The search terms of yoga and/ mindfulness and/or self-compassion and mental health and/or mental health nursing; yoga and anxiety and/or depression were used. The search was limited to papers in English, research involving adults with anxiety and/or depression and random controlled trials were used where available. Papers which focussed on a specific age group, comorbidities, pregnancy/prenatal yoga, physical health or other specific conditions were excluded. Secondary references were selected from the primary paper references and contacting expert academics in the field.

Yoga potential mechanisms of change for anxiety and depression

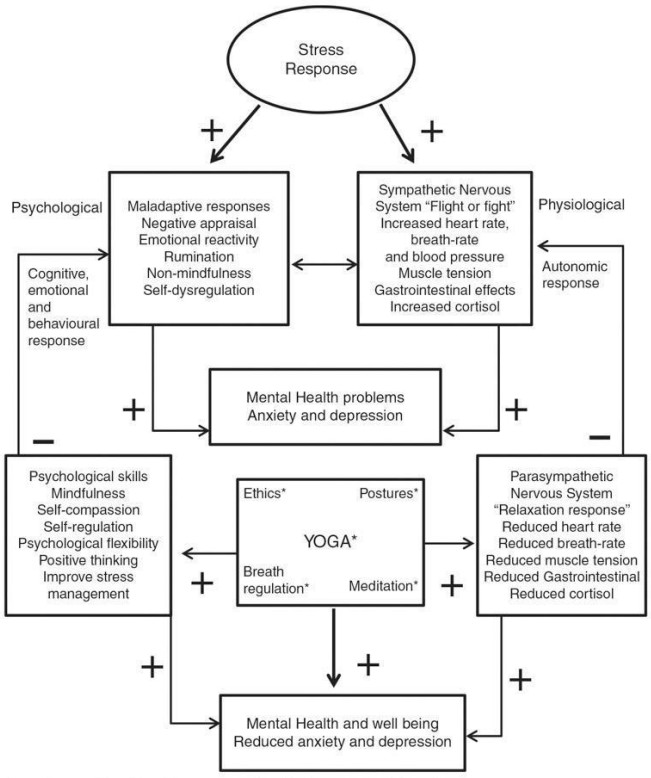
The exact mechanism of the reported mental health benefits from yoga are not well understood (Da Silva *et al.*, 2009; Field, 2011). Sherman (2012) proposes that the physical postures (asana), breath work (pranayama), meditation (*dhyana*) as well as relaxation, spiritual and mindfulness aspects of yoga may all contribute to improvements in anxiety and depression. There are a number of biological, physiological and psychological mechanisms including mindfulness and self-compassion, by which yoga may mediate psychological benefits (Da Silva *et al.*, 2009), which will be further discussed.

Biological and physiological mechanisms

Depression and anxiety have been described as disorders of the biochemical and neurophysiological systems and have been shown to adversely affect the chemicals that regulate mood in the brain (noradrenaline, serotonin, dopamine), the neurotransmitter gamma amino-butyric acid and cortisol levels (Cramer *et al.*, 2013). Yoga is thought to have a positive effect on biochemical and neurophysiological systems, including regulating the autonomic nervous system and stress response and thereby reduce symptoms of stress, anxiety and depression (Brown and Gerbarg, 2005; Salmon *et al.*, 2009) (Figure 1).

A stressor triggers the sympathetic nervous system to activate a chain of events, including an increase in blood pressure, heart rate and breath rate and release of cortisol, called the "fight or flight" stress response (Figure 1). Regular yoga practice decreases the sympathetic nervous system stress

Figure 1 The yoga mental health model describing the physiological and psychological mechanisms of yoga on the stress response and proposed mental health outcomes



Legend: ⟶ Direction of process; + Function increases; – Function decreases

Notes: The top half of the model shows the maladaptive responses of the psychological and physiological systems to stress, leading to anxiety and depression. The bottom half of the model shows the proposed influence of yoga on the psychological and physiological systems leading to a reduction anxiety and depression. *The four main components of yoga (ethics, breath regulation, postures and meditation) proposed by Gard *et al.*'s (2012) self-regulation model of yoga and based on the eight limbs of yoga are further discussed in Figure 2

response and activates the parasympathetic nervous system to reduce blood pressure, heart rate and breath rate and is linked to a decrease in stress and anxiety levels (Brown and Gerbarg, 2005; Cramer *et al.*, 2013) (Figure 1). Furthermore, the release of the "stress hormone" cortisol has been shown to reduce immediately following yoga practice (Michalsen *et al.*, 2005; Yadav *et al.*, 2012)

Pranayama or yogic breathing provides a powerful tool to voluntarily control breathing patterns and thus influence the autonomic nervous system stress response and emotional state (Brown and Gerbarg, 2005). Yogic breathing has shown to have an effect on brain function and physiological parameters, including stimulating parasympathetic nervous system activity and decreasing sympathetic nervous system activity to balance the "fight or flight" stress response (Brown and Gerbarg, 2005; Campbell and Moore, 2004; Udupa *et al.*, 2003) (Figure 1). Brown

and Gerbarg (2005) describe a state of "calm alertness" after yogic breathing, precipitated by the release of mood enhancing hormones (including serotonin, dopamine and endorphins) and relaxation of the stress response systems. The different aspects of pranayama including the phase and duration of the breathing cycle, breath volume, use of the mouth, nostrils, constriction of the laryngeal muscles, position of the glottis and postures, may all have different physiological effects (Brown and Gerbarg, 2005).

Yoga postures, breath work and meditation are all important aspects to consider in the physiological mechanisms of yoga benefits. The combination of postures with deep-breathing and meditation undertaken in yoga practice may be important in counteracting the stress response including restimulating digestive processes and increasing blood circulation to the organs (Campbell and Moore, 2004), further reducing the physical symptoms of anxiety and depression (Figure 1). Some forms of yoga are also thought to release mood-boosting dopamine and serotonin (Brown and Gerbarg, 2005; Salmon *et al.*, 2009) and thus may have a more long-term antidepressant effect.

Psychological mechanisms

Psychological mechanisms of yoga, including increased self-awareness (Arora and Bhattacharjee, 2008), coping mechanisms (Kinser *et al.*, 2013b; Rizzolo *et al.*, 2009), self-regulation (Gard *et al.*, 2012), psychological flexibility (Dick *et al.*, 2014), positive attitude towards stress (Woodyard, 2011), calmness (Sherman *et al.*, 2013), spirituality (Evans *et al.*, 2011), compassion and mindfulness (Chiesa and Serretti, 2009; Evans *et al.*, 2011), have all been proposed as mechanisms for mental health benefits (Figure 1).

Neuroplasticity, changes in neural pathways of the brain, are thought to occur through regular yoga practice (Brown and Gerbarg, 2005) and influence development and improvement in these psychological skills. This is a powerful connection suggesting that the brain, including thinking patterns and ability to cope with stress, can be trained and rewired much like a physical muscle of the body. In addition, yoga is thought to have a positive effect on brainwave activity by stimulating the activation of alpha, beta and theta brainwaves, which have been associated with improvements in cognition, memory, mood and anxiety (Desai *et al.*, 2015).

Yoga and mindfulness

Mindfulness interventions are growing in popularity for a range of mental and physical health conditions in a variety of health care settings (Baer *et al.*, 2012; Salmon *et al.*, 2009) Mindfulness interventions are thought to work by reducing negative rumination, encouraging a non-judgemental approach to self and others and promoting positive thinking. Several psychological processes of mindfulness, including improvement in mindfulness awareness, thought diffusion, exposure, acceptance, attentional control, memory, values clarification and self-regulation, have been proposed as potential mediators of positive psychological effects that may be achieved through mindfulness interventions (Baer *et al.*, 2012).

Mindfulness-based stress reduction and mindfulness-based cognitive therapy (MBCT) are well established structured group programmes which have demonstrated positive outcomes for stress, anxiety (Da Silva *et al.*, 2009; Kabat-Zinn, 1990) and depression (Baer, 2003; Davis and Hayes, 2011; Kabat-Zinn, 1990). However, the potential of other less structured and movement mindfulness-based interventions, such as yoga on mental health outcomes has not been well researched.

Mindfulness is often considered the "active ingredient" in yoga and linked to reported positive effects on anxiety and depression (Brisbon and Lowery, 2011; Knight *et al.*, 2014; Salmon *et al.*, 2009). Yoga focusses on being fully present and aware of the present moment experience. Yoga is often referred to as "mindfulness in motion" (Salmon *et al.*, 2009) and some preliminary research has suggested that yoga may increase levels of mindfulness (Conboy *et al.*, 2010; Shelov *et al.*, 2009). Shelov *et al.* (2009) reported improved overall mindfulness measured by the Frieburg mindfulness inventory after an eight-week yoga course. Similarly, Brisbon and Lowery (2011) found a positive correlation between yoga participant experience and levels of mindfulness and reduced

stress in a study comparing beginner to advanced yoga participants. Conclusions were that more thorough research is needed to examine the effect of yoga practice characteristics, including yoga style, consistency and years of practice, on mindfulness levels. The role of mindfulness as a mediator on the positive effects of yoga on depression and anxiety warrants investigation.

Several authors suggest that the movement aspect of yoga may simulate cognitive processes related to mindfulness and may be a more appealing activity for focussing attention than seated meditation due to the increased sensory awareness experienced with movement (Dick *et al.*, 2014; Salmon *et al.*, 2009).

Yoga and self-compassion

Self-compassion is a growing field of research in psychological well-being and is often measured in combination with measures of mindfulness. Neff describes self-compassion as "a healthy attitude towards oneself" including the three main components of kindness, common humanity and mindfulness. Self-compassion is thought to promote an emotionally positive self-attitude that may protect against negative consequences of self-judgement, isolation and rumination which may lead to depression.

There is much debate in psychological fields about the mediating roles of mindfulness and self-compassion on psychological health. Some research has shown that both mindfulness and self-compassion act as mediators of the positive effect of MBCT on depressive symptoms (Baer *et al.*, 2012; Kuyken *et al.*, 2010). Neff (2003) suggests a reciprocal relationship between mindfulness and self-compassion, whereby they facilitate and enhance each other, suggesting both are important measures. However, some emerging research indicates that self-compassion may be a stronger predictor than mindfulness of symptoms of anxiety and depression (Van Dam *et al.*, 2011). Many of the reported beneficial effects of self-compassion have emerged from mindfulness programmes when not directly addressed; this suggests self-compassion may be a powerful indicator of well-being in its own right and warrants further investigation.

Self-compassion is a significant contributor to positive mental health outcomes reported for anxiety and depression in structured mindfulness-based programmes (Baer *et al.*, 2012; Van Dam *et al.*, 2011); however few studies have examined the relationship between yoga and self-compassion. An uncontrolled pilot study of highly experienced yoga practitioners reported changes only in the mindfulness subscale of the self-compassion scale with yoga practice (Conboy *et al.*, 2010). Gard *et al.* (2012) reported improved scores on all aspects of self-compassion except common humanity, as well as increased total self-compassion, comparing pre- and post-intervention results of a yoga-based programme with young adults. Self-compassion was also reported to mediate quality of life and decreased perceived stress. Self-compassion and yoga is an exciting area for future research as self-compassion continues to emerge in the field of mindfulness research.

Yoga and self-regulation

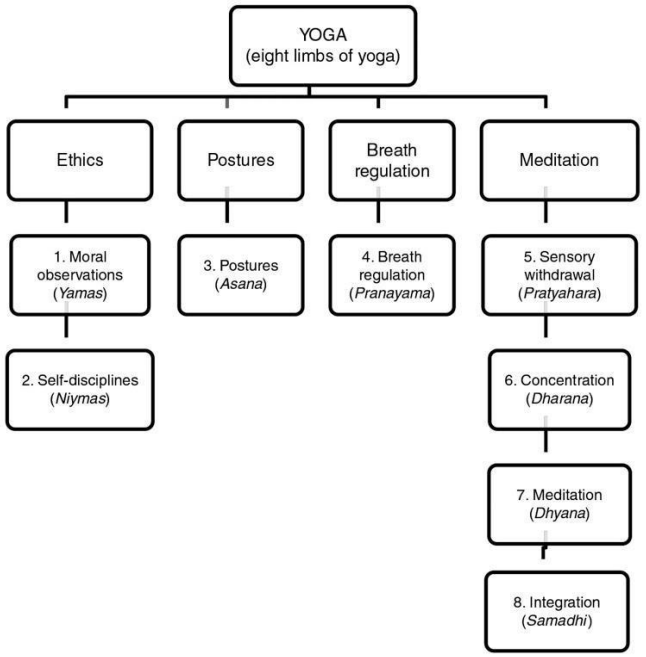
A growing body of evidence considers yoga to be a tool for self-regulation, with specific components thought to affect cognition, emotional, behavioural and autonomic systems and long-term psychological health, including ability to manage stress and utilise coping strategies (Dick *et al.*, 2014; Gard *et al.*, 2012; Salmon *et al.*, 2009). Mindfulness and self-compassion are likely to play an important central role in the self-regulation theory of yoga.

A self-regulation model developed through the eight limbs of yoga has been proposed by Gard *et al.* (2012), with the four broad categories of ethics, postures, breath regulation and meditation (Figure 2.) These components are thought to facilitate self-regulation of cognitions, emotions and behaviour through a bio-directional feedback system of the moral, behavioural and physiological mechanisms (Gard *et al.*, 2012) (Figure 2).

Yoga and mental health research

A search of the literature yielded limited published yoga and mental health research for anxiety and depression. Effects of yoga on depression have dominated the research field. In a systematic

Figure 2 Yoga self -regulation model based on the eight limbs of yoga



Source: Adapted from Gard *et al*. (2012)

review on the effectiveness of yoga for the treatment of depression Pilkington *et al.* (2005) identified yoga as a potential beneficial intervention, based on five randomised controlled trials. However, the use of different yoga interventions including, *Sudarshan Kriya Yoga* (SKY), *Iyengar*- and yoga-based relaxation and breathing techniques, and poor reporting of compliance and attrition rates were significant limitations. Similarly, a systematic review undertaken by Da Silva *et al.* (2009) found SKY yoga (based on specific breathing techniques), followed by *Iyengar* (alignment and prop-focussed yoga) and *Hatha* yoga (general yoga class) as the most effective forms of yoga for major depressive disorders. More recently, Cramer *et al.* (2013) reported limited-moderate evidence for yoga in producing short-term improvements in depression and anxiety compared to usual treatment, relaxation or aerobic exercise in a meta-analysis of 12 RCT's. However, they regarded these findings as promising and concluded that further high-quality research is needed.

Yoga interventions specifically for anxiety disorders have been even less researched. Kirkwood *et al.* (2005) examined eight studies in a systematic review of yoga for anxiety and found positive results. However, findings were limited by the large variation in yoga styles and anxiety conditions (obsessive compulsive disorder, snake phobia and general anxiety) as well as methodological weaknesses, including poor quality and/or reporting of methodology, poor quality or unclear randomisation and low attrition rate. More recently, Da Silva *et al.* (2009) undertook a systematic review and found very limited research on yoga and anxiety in the literature. Findings of the eight studies examined were positive, but again as yoga styles were often unspecified and research based on old classification schemes of psychoneurosis or anxiety neurosis the reliability of findings were justifiably questioned by the researchers. Some more recent small scale pilot studies have found promising results for yoga as an adjunct treatment for improving anxiety

symptoms in people with generalised anxiety disorders over time (Katzman *et al.*, 2012; Khalsa *et al.*, 2015). Findings indicate that the evidence for the effectiveness of yoga in managing and preventing anxiety is inconclusive and further rigorous research is needed.

In 2006 the yoga in Australia Survey was undertaken to examine the characteristics and practice of yoga students and teachers throughout Australia (Penman *et al.*, 2012). The survey found that although most people start yoga practice for health and fitness benefits, many continue for stress management. Furthermore, more people practise yoga for mental health rather than physical health conditions, suggesting that mental health may be the main health-related motivator for yoga practice (Penman *et al.*, 2012). Findings of the yoga in Australia survey and a review of the literature above provide a promising bench-mark for exploring future yoga and mental health research and the implications for health care professionals.

Current research limitations

Yoga research has been limited by the nature and wide variation of yoga practice, yoga styles and teaching methods (De Manincor *et al.*, 2015; Sherman, 2012; Varambally and Gangadhar, 2012). Methodological problems in published yoga research include variations in yoga styles and teaching methods, difficulties in double-blinding and finding a suitable placebo-control, lack of random controlled trials, small sample sizes and maintaining attrition rates (Field, 2011; Varambally and Gangadhar, 2012). The literature highlights that there is a lack of consensus of an appropriate model of how yoga may improve mental health and the need for more high-quality research.

Yoga research has been challenged by the rigorous requirements of research, most likely due to the highly variable and personal nature of yoga practice (Gangadhar, 2014). Randomised controlled trials are the highest standard of intervention research, but are particularly challenging for yoga given the inability to blind participants to the intervention, small size of yoga classes and difficulty controlling variables. Yoga research to date has been limited by methological inadequacies, including lack of randomisation, small sample sizes, low attrition rates, poor reporting of methodology, lack of blinding, absence of appropriate controls and large variation in yoga styles and teaching methods (De Manincor *et al.*, 2015; Salmon *et al.*, 2009; Sherman, 2012).

Yoga research design issues, including difficulties with adhering to the rigours of research due to the nature of yoga practice, have been a significant barrier. Sherman (2012) emphasises the need to carefully research the yoga style, components and teaching method appropriate to the health condition being examined when designing a yoga research intervention. Previous yoga experience and frequency of practice has also been highlighted in the literature as important factors to consider in developing yoga interventions, to ensure consistency across participants and control groups (Brisbon and Lowery, 2011; Ross *et al.*, 2012). Sherman's (2012) framework for designing yoga treatment protocols is a promising bench-mark for future yoga research and application to mental health. This paper may further contribute to a greater understanding of a yoga model for mental health and the role of health care professionals.

The development of a research protocol for yoga is difficult as this is often deemed by yoga practitioners to be inconsistent with the personal and experiential nature of yoga. Sherman (2012) proposed a set of guidelines for developing treatment protocols for yoga trials based on a systematic yet flexible framework that addresses eight characteristics which are listed below:

1. style of yoga;
2. dose and delivery of yoga;
3. components of the yoga intervention;
4. specific class sequences;
5. modifications;
6. selection of yoga teachers;
7. home practice; and
8. long-term follow up.

Sherman (2012) acknowledged that more specific treatment protocols for yoga remain a challenge and suggested alternative methods including using a combination of yoga theory, literature reviews, consultation with senior teachers, use of a formal Delphi process and practical aspects may be more appropriate.

Potential adverse effects of yoga for people with anxiety and depression have not been identified in the literature, but do need to be considered. Specific practices such as rapid breathing exercises, visualisations, extended meditation or advanced postures may increase the risk of symptom exacerbation, psychological or emotional distress, physical injury and/or increased drop-out rate (Uebelacker and Broughton, 2016). Yoga practices need to be tailored to individuals with anxiety and depression and class style and components carefully considered through the above detailed methods.

Implications for mental health professionals

Mental health professionals of all disciplines play an important role in advocating and reducing the stigma of complementary and alternative therapies such as yoga in the mainstream health care system. Anxiety and depression are common mental health conditions experienced by people in a variety of health care settings (Brown and Gerbarg, 2005; Louie, 2014) and complementary and alternative therapies are becoming more popular. However, the literature suggests that often people do not disclosed their alternative health practices to health care professionals, due to fear of stigma and belief that they may have a lack of interest, understanding or a negative attitude towards these practices (Louie, 2014). The development of the therapeutic relationship is central to reducing this stigma and promoting all the potential treatment options for consumers.

Nurses in particular are highlighted in the literature as integral in supporting consumers to adopt, maintain and incorporate yoga and mindfulness-based therapies into their life (Brown and Gerbarg, 2005; Louie, 2014). Yoga, similar to the nursing model of care is based on a holistic system of health which considers all components of an individual's physical, mental, emotional and spiritual well-being. The eight limbs of yoga provide a model which considers all these areas of health through integrating ethics, postures, breath work and meditation (Gard *et al.*, 2012; Kinser *et al.*, 2013a). The holistic model of yoga and mental health care is relevant to all disciplines and a range of health care settings.

Professionally, yoga-based therapies are a promising new role for mental health professionals to enhance their practice and lead a new initiative in evidence-based consumer centred care. Brown and Gerbarg (2005) further suggest that clinicians require personal knowledge and practice of yoga techniques in order to make appropriate referrals, support consumer daily practice and integrate yoga into their overall treatment. This paper provides promising scope for yoga as a therapeutic intervention for anxiety and depression and the importance of health care professionals in supporting, promoting and advocating for consumers to utilise alternative therapies.

Summary and future research

There is growing research evidence supporting the use of yoga as an adjunct or combination therapy for the management of stress, anxiety (Kirkwood *et al.*, 2005; Penman *et al.*, 2012) and depression (Da Silva *et al.*, 2009; Field, 2011; Penman, 2008; Penman *et al.*, 2012; Salmon *et al.*, 2009). Yoga-based mindfulness interventions are a promising field of research that may provide a cost-effective prevention and long-term self-management adjunct or combination treatment option for anxiety and depression.

Mental health professionals of all disciplines may play an important role in challenging stigma and implementing yoga-based interventions into the mainstream health care system. Yoga and nursing principles are particularly aligned as are both based on a holistic system of health, which considers all aspects of an individual's physical, mental and spiritual health (Gard *et al.*, 2012; Kinser *et al.*, 2013a). However, the yoga model of health is relevant to all disciplines and a range of health care settings.

Yoga research has been challenged by the rigorous requirements of research, including randomisation, blinding and appropriate controls (Gangadhar, 2014). The nature of yoga practice and wide variation in yoga styles, class components and teaching methods makes standard research design problematic and often inconsistent with yoga philosophy (De Manincor *et al.*, 2015; Salmon *et al.*, 2009; Sherman, 2012). Further high-quality research is needed to establish whether yoga is an effective therapeutic intervention for enhancing mindfulness and self-compassion and the potential relationship to mental health outcomes. Establishing the research design that minimises variables and has the most therapeutic benefit for the study population is the challenge. Evidence-based practice and research is essential to all mental health professions and guiding future clinical practice and consumer outcomes. The development of a yoga model for mental health is an exciting new initiative for mental health practice and service delivery.

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Appendix 2. Published Paper 2

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Mindfulness, self-compassion, anxiety and depression measures in South Australian yoga participants: implications for designing a yoga intervention

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ABSTRACT

Aim: The aim of the study was to examine the demographic and practice characteristics of current yoga participants and assess their levels of mindfulness, self-compassion, stress, anxiety, depression and wellbeing and implications for designing a yoga intervention.
Methods: A web-based survey was administered to South Australian yoga teachers and students from September 2014 to February 2015.
Results: Results showed a positive correlation with mindfulness and self-compassion and negative correlation with Depression, Anxiety and Stress scores with months of practice. Mindfulness and self-compassion scores were significantly higher with two or more classes per week and mindfulness higher in those with a regular meditation practice.
Discussion: Key findings indicate that class frequency, practice experience and meditation practice are important factors in designing a yoga intervention examining mindfulness and mental health.
Conclusion: Findings provide important information for guiding development of a yoga intervention for anxiety and depression.

1. Introduction

Anxiety and depression are common mental health problems, increasing in prevalence worldwide and with significant social and economic impact [37]. The World Health Organisation reports depression as the leading cause of disability and estimates over 300 million people experience depression and over 264 million experience anxiety globally [37]. In Australia, anxiety related conditions are the most prevalent at 2.6 million (11.2%), followed by mood disorders, including depression, at 2.1 million (9.3%) [2].

Current treatments for depression and anxiety include a range of pharmacological [33], psychological [13,18], lifestyle [8] and complementary therapies [19], electro-convulsive therapy (ECT), and a combination of these interventions [33]. However, side effects, effectiveness, cost, accessibility and ethics of invasive treatments are a concern and long term benefits of these treatments are little known [15].

Complementary and alternative therapies are growing in popularity in the management of anxiety and depression [15]. Yoga is increasingly being recognised as an effective adjunct therapy for a range of mental health conditions, including depression [10,12,29], anxiety [10,21,34] and stress [28,36]. Yoga and depression research is promising with a meta-analysis of 12 randomised controlled trials (RCTs) of people with depressive disorders, reporting evidence for short-term improvements in severity of depression with yoga practice [10]. The effectiveness of yoga in treating anxiety disorders has been less researched but there are promising findings from small scale studies on the benefits of yoga for reducing anxiety [6,11,12,34].

The exact mechanism of yoga mental health benefits is unclear and may be influenced by a combination of factors, including postures, breath-work, meditation, mindfulness and spiritual aspects [12,16,32]. Mindfulness has been indicated as the "active ingredient" in yoga linked to positive mental health outcomes [31]. Mindfulness-based therapies are gaining popularity with structured programs well established in a wide range of health care settings [12,24]. Self-compassion is a growing field of research in psychological well-being and is often measured in combination with mindfulness. Both mindfulness and self-compassion have been shown to act as mediators of the positive effect of Mindfulness-Based Cognitive Therapy on depressive symptoms [3,22]. Neff [26]Pproposes a reciprocal relationship between

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mindfulness and self-compassion, whereby they facilitate and enhance each other, suggesting both are important concepts.

Yoga is a traditional philosophy and practice originating in India over 5000 years ago [9] and based on a holistic and comprehensive system of health and well-being. Yoga may be a suitable alternative or adjunct therapy for people with anxiety and depression due to its affordability, accessibility, benefits for general health and well-being and concerns of stigma associated with traditional treatments [35].

The research evidence is promising and indicates an exciting role for yoga in future mental health care. However, further research is needed on the potential role of yoga as a 'movement-based mindfulness' intervention and as an adjunct therapy for anxiety and depression. Therefore, the aim of the study was to examine the personal and practice characteristics and experience of current yoga teachers and students in the community and assess their levels of mindfulness, self-compassion, stress, anxiety, depression and wellbeing; and use study findings to inform the later design of a yoga intervention.

1.1. Objectives

1 Survey yoga teachers and students to measure their teaching characteristics and practice characteristics, respectively, and their levels of mindfulness and self-compassion
2 Test for relationships between home practice, class frequency, class length, meditation and practice experience on levels of mindfulness, self-compassion and mental health outcomes (depression, anxiety, stress and wellbeing)
3 Identify key components for designing a yoga intervention

2. Methods

2.1. Study design

A web-based survey was administered in South Australia to yoga teachers and students from September 2014 to February 2015. The yoga teacher and student surveys were developed through consultation with Yoga Australia, yoga teachers, researchers in the field and existing survey formats, e.g. the Yoga Australia Survey [27]. Individual teachers were linked to their students via a code.

2.1.1. Yoga teacher survey

The yoga teacher survey included three sections: (1) demographic information, (2) yoga background, and (3) mindfulness measures, including the Five Facet Mindfulness Questionnaire Short Form (FFMQ-SF) and Self-Compassion Scale short-form (SCS-SF). It was piloted with interstate yoga teachers not involved in the research project.

2.1.2. Yoga student survey

The Yoga Student Survey included four sections as follows:

1 Demographic questions
2 Yoga practice characteristics and experience
3 Mindfulness measures
3a Five Facet Mindfulness Questionnaire Short Form (FFMQ-SF)

The FFMQ is a 39-item questionnaire that provides subscale scores for five elements of mindfulness, including observing, describing, acting with awareness, non-judging of and non-reactivity to the inner experience [3]. The FFMQ-SF is a shorter 24-item questionnaire [5] that is a reliable and validated tool [5] shown to be a good indicator of many variables related to mindfulness [3].

Research has shown that the observe subscale of the FFMQ and FFMQ-SF may function differently in populations with meditation experience [4,14]. The 'Observing' sub-scale and self-focused attention is thought to be maladaptive in those without meditation experience, and may increase self-judgment and self-critical responses, whereas people who practise meditation learn to observe and experience all sensations in a more open minded, mindful and non-judgemental way [4,14]. Therefore, the FFMQ-SF, FFMQ-SF (no observe) subscale and the observe subscale alone were examined in this research project.

3b Self-Compassion Scale Short-Form (SCS-SF)

The Self-Compassion Scale (SCS) is a 26-item questionnaire with six subscales assessing self-compassion: self-kindness, self-judgement, common humanity, isolation, mindfulness and over-identification, as well as a total self-compassion and is established as a valid and reliable measure of psychological well-being [3,25,30]. The SCS is a 26-item questionnaire. The Self-Compassion Scale Short-Form (SCS-SF) is a shorter 12-item questionnaire which is a reliable and valid alternative to the full SCS [30].

4 Mental Health Outcomes
4a Depression, Anxiety and Stress Score 21 (DASS21)

The Depression, Anxiety and Stress Scale 21 (DASS21) has been well validated as an effective tool to measure depression, anxiety and stress levels in a range of clinical [1] and non-clinical populations [17].

4b Mental Health Continuum-Short Form (MHC-SF)

The Mental Health Continuum-Short Form (MHC-SF) is a 14 item questionnaire and considered a reliable and valid measure of mental wellbeing [20,23]. The MHC is based on the notion that mental health is not just the absence of mental illness, but also the presence of emotional, psychological and social wellbeing [23].

The yoga student survey was piloted with interstate and South Australian yoga students and teachers who were not involved in the research project.

2.2. Participant recruitment

Yoga Australia (YA) and the Yoga Teachers Institute of South Australia (YTISA) supported recruitment by emailing information about the project to 40 registered yoga teachers. Yoga teachers who were interested then contacted the researcher to complete the online survey. Three reminder emails were sent to all registered YA and YTISA yoga teachers in the state. Yoga teachers distributed the yoga student online or hard copy survey to their students and provided three reminders to students.

2.3. Data analysis

Data was analysed using the SPSS statistical program. Descriptive statistics were used to describe and summarise the data. Inferential statistics were used to assess the influence of independent variables (home practice, class length, class frequency, meditation and practice experience) on dependent variables (FFMQ-SF, SCS-SF, DASS21 and MHC-SF scores). Independent sample t-tests were used to compare continuous variables (FFMQ-SF, SCS-SF, DASS21 and MHC-SF) between groups based on home practice, class frequency, class length and meditation. The Bivariate Pearson's product-moment co-efficient (r) was calculated to assess the size and direction of the relationship between practice experience and FFMQ-SF, SCS-SF, DASS21 and MHC-SF scores. Independent samples t-test was used to compare student to teacher FFMQ-SF and SCS-SF scores. Linear mixed model analysis was undertaken to examine the influence of independent variables identified in the univariate analysis with the dependent variables (FFMQ-SF, SCS-SF, DASS21 and MHC-SF). Effect sizes were based on Cohen's d (1988) as follows, 0.20 (small), 0.50 (medium) and 0.80 (large) and in a correlation, 0.10 (small), 0.30 (medium) and 0.50 (large) [7].

2.4. Ethics approval

Ethics approval was obtained from the University of Adelaide Human Research Ethics Committee.

3. Results

3.1. Yoga teachers

Twenty-four (60%) of the 40 registered South Australian yoga teachers who responded to the initial email completed surveys, and 17 of these yoga teachers (71%) distributed the yoga student surveys to their classes. Ninety two percent (n = 22) of yoga teachers were female and over 60% were aged 35–54.

In this survey, most yoga teachers were qualified at level one (42%), equivalent to 350 h training and three years teaching experience and over two thirds were registered with the Yoga Institute of South Australia and Yoga Australia. Yoga teacher's practice experience ranged from 8 to 41 years with an average of 24.3 years and teaching experience ranged from 1 to 45 years with an average of 12.4 years.

Yoga teachers predominantly taught 1–3 classes per week (54%) and Hatha yoga was the most common style (84%). All classes included postures, breath-work and meditation; other components included music (71%), spiritual teachings (50%), chanting (33%) and use of candles or incense (29%). All yoga teachers identified health and fitness and spiritual reasons as motivation for their practice, 88% also identified stress management, 63% to reduce or manage anxiety and 46% to reduce or manage depression.

3.2. Yoga students

One hundred and eighty-one yoga students completed the yoga student surveys out of a possible 378, giving a response rate of 48%. There were 166 (92%) female and 15 (8%) male respondents, two-thirds were aged over 35 and over fifty percent (n = 93) had a University education and were employed.

Yoga practice experience ranged from one month to 50 years with an average of 8.84 years. Seventy-five percent (n = 135) of students practiced hatha yoga and most classes included postures, breath-work, meditation and music (Table 1). Seventy-two percent (n = 130) of yoga students practiced yoga at home in addition to attending yoga classes, with the main home practices of gentle hatha (n = 52) and practice of specific postures (n = 32). Seventy-seven percent (n = 140) of students practiced yoga once a week and 68% (n = 129) practiced a 60–90-min class. Meditation practice, in addition to yoga practice, was undertaken by 28% (n = 50) of yoga students. Ninety four percent of students practice yoga for health and fitness benefits, 62% for spiritual aspects, 56% for stress management, 43% to reduce and/or manage anxiety and 20% to reduce and/or manage depression (Table 1).

Table 1
Yoga student practice characteristics.

Variable		n	Percentage (%)
Yoga style	Hatha	135	74.6
	Vinyasa	23	12.7
	Iyengar	9	5.0
	Dru	5	2.8
	Bikram	1	0.6
	Other	3	1.7
Home practice	No	51	28
	Yes	130	72
Class frequency	Once a week	140	77
	2 or more classes per week	28	16
Class length	30–60min	30	16.6
	60–90min	129	68.0
Meditation	No	131	72
	Yes	50	28
Why practise yoga?[a]	Health & fitness	170	94
	Spiritual	112	62
	Stress Management	101	56
	Anxiety	78	43
	Depression	36	20

[a] Multi-select responses.

Table 2
Yoga teachers and student mindfulness and self-compassion measure, including number (*n*), mean (*M*), Possible score range, standard deviation (*SD*), t-score (*t*), probability (*P*) and effect size (*d*).

Variable		n	M	Possible Score range	SD	*t*	*P*	*d*
FFMQ-SF	Teachers	15	93.5	24–120	11.3	−2.92	0.004[a]	0.78
	Students	176	84.7		11.1			
FFMQ-SF (no observe)	Teachers	15	76.4	20–100	10.2	−2.67	0.008[a]	0.71
	Students	174	69.2		10.1			
FFMQ-SF Observe subscale	Teachers	16	17.1	4–20	2.1	−2.11	0.036[a]	0.74
	Students	175	15.6		2.8			
SCS-SF	Teachers	16	47.3	12–60	7.7	−3.34	0.001[a]	0.89
	Students	161	40.4		7.9			

[a] Denotes significant difference.

3.3. Mindfulness and self-compassion scores

Yoga teachers (n = 15) and students (n = 176) completed the Five Facet Mindfulness Questionnaire-Short form (FFMQ-SF) with mean scores of 93.5 ± 11.3 (1SD) and 84.7 ± 11.1 respectively. The mean FFMQ-SF without observe was 76.4 ± 10.2 for teachers and 69.2 ± 10.1 for students and the FFMQ-SF observe facet with mean score of 17.1 ± 2.1 for teachers and 15.6 ± 2.8 for students (Table 2). Yoga teachers (n = 16) and students (n = 161) completed the SCS-SF with mean scores of 47.3 ± 7.7 and 40.37 ± 7.9 respectively (Table 2). Scores for teachers were significantly greater ($P < 0.05$) than students on all four measures, and with medium to large effect sizes (0.71–0.89) (Table 2), as per Cohen's *d* [7].

3.4. Mental health measures (students)

The mean DASS21 score for yoga students (n = 172) was 20.2 ± 16.6, mean Depression score 5.6 ± 7.0 (n = 171), Anxiety 4.4 ± 4.9 (n = 168) and stress 10.1 ± 7.2 (171), which were all within the normal range. The mean MHC-SF score for yoga students (n = 171) was 49.6 ± 12.6 out of a possible 70 (Table 3).

3.5. Yoga practice variables (students)

Univariate analysis was used to examine the outcomes for FFMQ-SF, SCS-SF, MHC-SF and DASS21 across levels of home practice, class frequency, meditation practice and practice experience.

Home practice

An independent samples *t*-test showed no significant difference

Table 3
Summary of student mental health measures, including number (n), Mean (M), Standard deviation (D) and normal score range.

Variable	n	M	SD	Normal Score range
DASS21	172	20.2	16.6	0–30
DASS21 - Depression	171	5.6	7.0	0–9
DASS21 – Anxiety	168	4.4	4.9	0–7
DASS21 – Stress	171	10.1	7.2	0–14
Mental Health Continuum- SF	171	49.6	12.6	0–70

Table 4
Home practice: Comparison of mindfulness and mental health measures between home yoga practice and no home practice, including number (*n*), mean (*M*), standard deviation (*SD*), t-score (*t*), probability (*P*), degrees of freedom (*df*) and effect size (*d*).

Variable	No home practice			Home practice			*t*	*P*	*df*	*d*
	n	*M*	*SD*	*n*	*M*	*SD*				
FFMQ-SF	49	82.6	9.7	127	85.5	11.6	−1.59	0.11	174	−0.28
FFMQ-SF (no observe)	49	67.4	8.8	125	69.8	10.5	−1.42	0.16	172	−0.13
FFMQ-SF Observe subscale	48	14.9	2.6	127	15.9	2.8	−2.18	0.03[a]	173	−0.21
SCS-SF	44	40.4	8.4	117	40.3	7.7	0.07	0.95	159	0.01
DASS21	46	18.9	13.7	126	20.7	17.5	−0.66	0.51	170	0.12
DASS21- depression	46	5.7	6.8	125	5.6	7.0	0.03	0.98	169	0.00
DASS21-Anxiety	45	3.3	3.8	123	4.8	5.2	−2.06	0.04[a]	107	−0.34
DASS21-Stress	47	9.8	6.3	124	10.3	7.6	−0.39	0.69	169	−0.07
MHC-SF	47	48.6	12.7	124	50.1	12.4	−0.61	0.54	169	−0.12

[a] Denotes significant difference.

between the FFMQ-SF, FFMQ-SF (no observe), SCS-SF, DASS21, DASS21 Depression subscale, DASS21 stress subscale or MHC-SF for home yoga practice compared to no home yoga practice (Table 4).

There was a significant difference for the FFMQ-SF observe subscale and the DASS21 anxiety subscale, suggesting participants who practised yoga at home scored significantly higher on the FFMQ-SF Observe subscale and DASS21 Anxiety subscale, but effect sizes were small (Table 4).

Class frequency

There was a borderline significant difference between class frequency and FFMQ-SF score, with the higher score in those that practice two or more times per week, but effect size was small (0.36) (Table 5). There was a significant difference between yoga class frequency for FFMQ-SF (without observe) score suggesting a higher score for those who practice two or more times compared to once per week, but again the effect size of 0.40 was small to medium (Table 5). There was no significant difference for class frequency with the FFMQ-SF Observe subscale score (Table 5).

There was no significant difference between the SCS-SF, DASS21 scores or sub-scale scores for Depression, Anxiety and Stress; or MHC-SF for participants who practise once per week compared to those who attend two or more yoga classes per week (Table 5).

Class length

There was no significant difference between FFMQ-SF, FFMQ-SF (no observe), FFMQ-SF observe subscale score, SCS-SF, DASS21, Depression, Anxiety or Stress; or MHC-SF scores of participants who practise a 30–60 min class compared to 60–90 min classes (Table 6).

Meditation

There was a significant difference between FFMQ-SF, FFMQ-SF with no observe, FFMQ-SF Observe subscale and the DASS21 Stress subscale for those who practised meditation compared to those that did not, with small to medium effect sizes (Table 7). There was no significant difference for DASS21, Depression or Anxiety sub-scale scores; SCS-SF or MHC-SF between those that practise meditation compared to those that do not (Table 7).

Practice experience

Practice experience in months was positively correlated with the, FFMQ-SF (no observe) FFMQ-SF observe subscale and SCS-SF, suggesting higher mindfulness and self-compassion scores with more months of practice. However, effect sizes were small to medium (r = 0.18–0.27).

There was a negative correlation between DASS21, DASS21 Depression and DASS21 Stress scores with months of practice, suggesting lower DASS21, depression and stress subscales with months of practice, but effect sizes were again small (r = −0.17-0.22). There was no correlation between DASS21 Anxiety subscale scores or the MHC-SF and months of yoga practice (Table 8).

3.6. Mixed model analysis

Linear mixed model analyses were used to test for significant relationships between the predictors: home practice, class frequency, meditation practice and practice experience and outcomes: FFMQ-SF, SCS-SF, DASS21 variables and MHC-SF. Predictors identified in the univariate analysis with a P value < 0.2 were included in an initial multivariable model. The conservative P value of < 0.2 was used as some covariates may not be significant in a univariate regression but are significant in a multivariate regression. The covariates in the multivariate analysis with highest P value were removed one at a time via a process of backwards elimination, and the process was repeated until

Table 5
Class frequency: Comparison between mindfulness and mental health measures of people who practise yoga once per week compared to two or more times per week, including number (*n*), mean (*M*), standard deviation (*SD*), t-score (*t*), probability (*P*), degrees of freedom (*df*) and effect size (*d*).

Class frequency	One class per week			2 or more classes per week			*t*	*P*	*df*	*d*
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*				
FFMQ-SF	141	83.9	10.6	34	88.2	12.8	−2.02	0.05	173	−0.36
FFMQ-SF no observe	137	68.4	9.7	35	72.6	11.2	−2.21	0.03[a]	170	−0.40
FFMQ-SF Observe	139	15.5	2.7	35	16.1	3.0	−1.14	0.26	172	−0.21
SCS-SF	133	40.0	7.6	28	41.9	9.0	−1.13	0.26	159	−0.22
DASS21	138	20.6	17.0	33	18.6	15.1	0.63	0.53	169	0.13
DASS21- depression	137	5.7	7.1	33	5.2	6.5	0.42	0.67	168	0.04
DASS21-Anxiety	135	4.4	4.9	32	4.3	5.2	0.11	0.92	165	0.01
DASS21-Stress	137	10.5	7.4	33	8.8	6.5	1.20	0.23	168	0.24
MHC-SF	137	49.1	12.6	33	51.4	12.1	−0.95	0.34	168	−0.19

[a] Denotes significant difference.

Table 6
Class length: Comparison between mindfulness and mental health measures of people who practise a 30–60min yoga class compared to 60–90min class, including number (*n*), mean (*M*), standard deviation (*SD*), t-score (*t*), probability (*P*), degrees of freedom (*df*) and effect size (*d*).

Class length	30–60 min class			60–90 min class			*t*	*P*	*df*	*d*
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*				
FFMQ-SF	29	82.8	10.4	127	85.2	11.5	−1.04	0.30	154	−0.22
FFMQ-SF (no observe)	30	68.0	9.4	124	69.5	10.5	−0.73	0.47	152	−0.95
FFMQ-SF Observe subscale	30	15.5	3.0	125	15.7	2.7	−0.31	0.81	153	−0.03
SCS-SF	29	39.8	8.4	116	40.5	7.7	−0.45	0.66	143	−0.09
DASS21	29	24.1	19.5	124	19.1	14.8	1.55	0.12	151	0.29
DASS21- depression	29	6.9	8.7	123	5.1	6.1	1.31	0.19	150	0.24
DASS21-Anxiety	28	4.5	5.3	122	4.4	4.6	0.06	0.95	148	0.01
DASS21-Stress	29	12.3	7.6	123	9.6	6.9	1.92	0.06	150	0.38
MHC-SF	29	49.3	12.3	124	49.7	12.9	−0.13	0.90	151	−0.03

*Denotes significant difference.

Table 7
Meditation: Comparison of mindfulness and mental health measures between people who practice meditation and those who do not, in addition to their yoga practice, including number (*n*), mean (*M*), standard deviation (*SD*), t-score (*t*), probability (*P*), degrees of freedom (df) effect size (*d*).

Meditation	No meditation			Meditation			*t*	*P*	*df*	*d*
Variable	*n*	*M*	*SD*	*n*	*M*	*SD*				
FFMQ-SF	126	83.3	10.2	50	88.3	12.5	−2.76	0.01[a]	174	−0.22
FFMQ-SF (no observe)	125	68.1	9.4	49	71.8	11.3	−2.22	0.03[a]	172	−0.36
FFMQ-SF Observe subscale	125	15.3	2.8	50	16.4	2.5	−2.51	0.01[a]	173	−0.43
SCS-SF	117	39.8	7.8	44	41.8	8.0	−1.44	0.15	159	−0.25
DASS21	123	21.4	17.0	49	17.3	15.1	1.47	0.14	170	0.24
DASS21- depression	123	5.9	7.2	48	5.0	6.2	0.78	0.44	169	0.14
DASS21-Anxiety	118	4.4	4.8	50	4.4	5.2	−0.06	0.95	166	−0.01
DASS21-Stress	122	11.0	7.5	49	8.0	6.1	2.45	0.02[a]	169	0.43
MHC-SF	122	49.1	12.7	49	51.1	12.2	−0.95	0.35	169	−0.16

[a] Denotes significant difference.

Table 8
Practice experience: Correlation of mindfulness and mental health measures and months of practice, including number (*n*), Pearson's correlation (*r*), probability (*P*) and degrees of freedom (df).

Variable	Practice experience			
	n	*r*	*P*	*df*
FFMQ-SF	168	0.24	0.002[a]	166
FFMQ-SF (no observe)	165	0.19	0.011[a]	163
FFMQ-SF Observe subscale	167	0.20	0.010[a]	165
SCS-SF	153	0.28	0.000[a]	151
DASS21	164	−0.21	0.007[a]	162
DASS21- depression	163	−0.17	0.027[a]	161
DASS21-Anxiety	160	−0.12	0.13	159
DASS21-Stress	163	−0.23	0.003[a]	161
MHC-SF	164	0.10	0.18	162

[a] Denotes a significant correlation.

all covariates had a P value < 0.05.

There was a statistically significant association between FFMQ-SF and class frequency (P = 0.048), meditation (P = 0.002) and practice experience (P = 0.001) in the multivariate analysis. Those practising yoga two or more times per week had a 4.0 unit higher mean FFMQ-SF score (95% CI: 0.0, 8.0) compared to those who practice once per week. Those with a meditation practice had a 5.6 unit higher mean FFMQ-SF score then those who do not (95% CI: 2.0, 9.1) and there was a 0.02 increase in mean FFMQ-SF score with each month increase in practice experience (95% CI: 0.0, 0.0). FFMQ-SF no observe also showed a significant association with class frequency (P = 0.03), meditation practice (P = 0.02) and practice experience (P = 0.01). The FFMQ-SF Observe facet showed a significant association with meditation (P = 0.006) and practice experience (P = 0.01) (Table 9).

The SCS-SF had a significant association with practice experience (P = 0.00) (Table 9). The DASS21 Stress and Depression facets showed a significant association with practice experience and the stress facet with meditation, suggesting that lower scores occur with increased practice experience and increased meditation practice respectively. The MHC-SF, DASS21 and DASS21 Anxiety facets did not show any significant associations with the variables measured (Table 9).

4. Discussion

In this study, both yoga teachers and students recognised the mental health benefits of yoga. Stress management was identified as a strong motivator for yoga practice and nearly half of all survey participants practice yoga to reduce or manage anxiety and many to reduce or manage depression. Findings were similar to the 2006 Yoga in Australia Survey [27] of nearly 4000 yoga teachers and students, which found that many people practice yoga for mental health benefits such as stress management.

Yoga teachers scored significantly higher than students in all measures of mindfulness and self-compassion and had an average of 24.4 years of yoga experience compared to 8.4 years for students. The explanation for higher mindfulness and self-compassion scores for teachers may be their increased exposure to yoga and mindfulness practices over time, their intensive training and ongoing professional development and the possibility that people with higher mindfulness levels may be attracted to yoga teaching. Similarly, other studies have shown higher mindfulness levels in people who meditate over a long period of time compared to non-meditators [4,14], suggesting practice experience over time may be an important factor.

Relationships were identified between class frequency, practice experience and meditation with mindfulness measures in this study. Practice experience was associated with higher mindfulness and self-compassion levels and decreased DASS21 stress and depression levels

Table 9
Mixed model analysis of Independent variables (IV) home practice, class frequency, meditation practice and practice experience predictors on Dependent variables (DV) of FFMQ-SF, FFMQ-SF No observe, FFMQ-SF Observe facet, SCS-SF and DASS21, including estimate, F, t, P and 95% confidence interval.

DV	IV	Estimate	F	*t*	P	95% Confidence interval	
						Lower	Upper
FFMQ-SF	Class Frequency	4.01	3.98	1.99	0.048[a]	0.0	8.0
	Meditation	5.57	9.48	3.08	0.002[a]	2.0	9.1
	Practice Experience	0.02	11.32	3.37	0.001[a]	0.0	0.0
FFMQ-SF (No observe)	Class Frequency	4.02	4.76	2.18	0.03[a]	0.4	7.7
	Meditation	4.15	6.04	2.46	0.02[a]	0.8	7.5
	Practice Experience	0.02	7.45	2.73	0.01[a]	0.0	0.0
FFMQ-SF	Meditation	1.30	7.64	2.76	0.006[a]	0.4	2.2
-Observe	Practice Experience	0.01	6.35	2.52	0.01[a]	0.0	0.0
SCS-SF	Practice Experience	0.02	13.12	3.62	0.00[a]	0.0	0.0
DASS21	Practice Experience	−0.02	7.34	−2.71	0.07	−0.0	−0.0
DASS21	Practice experience	−0.01	8.28	−2.88	0.005[a]	−0.0	−0.0
- Stress	Meditation	−3.36	7.38	−2.72	0.007[a]	−5.8	−0.9
DASS21 - Anxiety	Practice experience Home practice	−0.01	3.07	−1.75	0.08	−0.1	0.0
		1.51	2.94	1.72	0.09	−0.2	3.3
DASS21 - depression	Practice experience	−0.01	−4.99	−2.24	0.03[a]	−0.0	−0.0
MHC-SF	Practice experience	0.01	1.78	1.33	0.18	−0.0	0.0

[a] Denotes significant difference.

with months of practice, again suggesting that consistency of practice over time is an important factor. The Depression, Anxiety and Stress (DASS21) scores tended to decrease with months of practice in the univariate analysis but this was not supported in the multivariate analysis and may need further research.

Class frequency was an important factor for mindfulness, with higher levels with two or more classes per week compared to one class per week. Interestingly, class length did not influence any of the mindfulness or psychological measures, suggesting the duration of the class is not as important as consistency and frequency of yoga practice. This is consistent with other research into yoga interventions [32] and general community practice [27], which suggest a minimum of two classes per week.

Those who have a meditation practice scored lower DASS21 Stress and higher mindfulness levels, as expected and consistent with other research [3]. This study did not show a significant relationship between mindfulness and self-compassion with Depression, Anxiety and Stress scores for most domains, however this may be related to the low DASS21 score ranges of participants. Yoga classes that emphasise mindfulness are thought to be particularly helpful for people with anxiety and depression [34] and these findings may be more significant in a clinical population.

The benefits of other specific class components were not explored in this study, however, postures, breath-work and meditation where identified in all and music and spiritual aspects in over 50% of classes, suggesting these are common practices in general yoga classes. Similarly, in a Delphi study by Ref. [15]; specific practices of breath regulation, meditation and relaxation were identified as important components of yoga practice for depression and anxiety.

Home practice did not influence mindfulness or mental health outcome measures in the multivariate analysis; however, 72% of yoga students engage in home yoga practice suggesting some perceived benefit to individuals. Interestingly, those who had a home yoga practice had a significantly higher FFMQ-SF Observe sub-score and DASS21 Anxiety sub-score in the univariate analysis. This may be related to the theory that 'Observing' and self-focused attention of the FFMQ-SF may be maladaptive in those without meditation experience and may increase self-judgment and self-critical responses [4,14]. Findings may also suggest that home practice is undertaken by participants who are experiencing more anxiety, possibly as a strategy to improve confidence and reduce anxiety related to yoga skills, in this population.

Key characteristics identified in this study for the design of a yoga intervention exploring mindfulness, self-compassion and measures of stress, anxiety and depression include recommendations of yoga class practice twice a week, home practice and additional meditation practice. Class length was not deemed to be an important factor for the mindfulness and mental health measures examined in this study.

Limitations include that the study was limited to South Australia and yoga teachers and students who were interested in being involved, which may have created a bias toward particular populations. Yoga teachers needed to complete a web-based survey, which may have excluded possible participants. Similarly, yoga students had to complete either a web-based or hard-copy survey as nominated by their teacher, either of which method may have influenced completion rates. Finally, the proposed characteristics identified in this study for a future yoga intervention do not address issues of feasibility, practicality or consumer perspectives.

5. Conclusion

This research project provided important insights into designing a yoga intervention exploring mindfulness, self-compassion and measures of stress, anxiety and depression. Overall, findings suggest that factors to consider in yoga course design include practice frequency with a minimum of two classes per week indicated; additional meditation practice and home practice. Practicing yoga over a long period of time appears to be a consistently important factor for a positive influence on mindfulness and self-compassion. Further research is needed to explore the long-term benefits of yoga on mindfulness and self-compassion levels and the relationship with depression, anxiety, stress and wellbeing scores in a clinical population.

Declaration of interest

None.

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Authorship

All authors have materially contributed to the conception and design of the study and interpretation of data, drafting of the article and

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Qualifications

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Dr Philippa Rasmussen I am the coordinator of the Master of Nursing Science program and the Internationalisation Lead for the School of Nursing. I have worked at the in the School of Nursing since 2009. I am a credentialed mental health nurse with a clinical background in child and adolescent mental health and community health. My main areas of practice have been infant, child and adolescent mental health and community health. I spent many years working as a senior clinician in both the public and private sectors as well as in the United Kingdom. She has worked in health sector as an educator and a manager and at the Nurses Board of South Australia as a Nursing Investigation Officer. I completed my PhD, entitled 'The role and work of Child and Adolescent Mental Health Nurses', in 2012 and have since developed collaborative relationships for post-doctoral research. I was awarded the Eleanor Harald Postdoctoral Fellowship in 2016 to further develop my research in Professional Identity, Currently I am leading a research project in collaboration with international nursing scholars in the area of Professional Identity in nursing.

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- Mental Health Nurse (credentialed)

2008–2012	Flinders University	Australia	PhD
1999–1999	Flinders University	Australia	Graduate Certificate of Health - Child and Adolescent Mental Health Nursing
1997–1999	Deakin University	Australia	Graduate Diploma Psychological Studies
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Dr Michael Proeve I have a background as a clinical psychologist who worked particularly in forensic mental health settings, sexual offender treatment and in private practice. My research is concerned with various issues concerning assessment and treatment of offenders, as well as treatment approaches in clinical psychology, particularly mindfulness-based and other third wave interventions. I have held managerial positions in sexual offender treatment, forensic mental health and correctional services. Previous academic positions at RMIT University and University of South Australia, teaching in undergraduate and postgraduate courses. Program Director of Clinical and Forensic Psychology at University of South Australia. Visiting academic positions in Department of Criminology, University of Melbourne, and University of Tabuk, Saudi Arabia.

Positions

2012	Senior Lecturer	University of Adelaide
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2003–2010	Senior Lecturer	University of South Australia
2002–2002	Acting Director	Forensic Mental Health Service
2000–2002	Director	Sex Offender Treatment and Assessment Program
1995–1999	Lecturer	RMIT University
1992–1994	Senior Psychologist	Forensic Psychiatry Services

Qualifications

2002	University of South Australia	Australia	PhD
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Appendix 3. Phase 2 – Yoga teachers survey

PARTICIPANT INFORMATION SHEET

Yoga in South Australia Research Project (Ethics Approval no H-2014-141)

Dear Yoga Teacher

This is an invitation for you and your class to take part in the 'Yoga in South Australia research project'. This research is a PhD project at the University of Adelaide to explore the *role of yoga on mental health and well-being*. Your commitment will involve completing the following 10-15 minute online Yoga Teachers Survey and explaining and distributing the Yoga Students Survey to your class.

The aim of the Yoga Teacher Survey is to examine the characteristics of your yoga classes, including style, delivery, teacher training and experience. The aim of the Yoga Student Survey is to examine the practice and personal characteristics of current yoga participants aged 18 years and over, as well as questions concerning mindfulness, self-compassion, stress, anxiety, depression and well-being. The Yoga Teachers and Student Surveys will be linked via a code to further evaluate student results. Survey findings will be used to design phase 2 of the project, an intervention to research the role of yoga on mental health and well-being.

It is not anticipated that there will be any risks associated with participating in the project. However, if you experience any psychological distress during or after completing the survey we recommend you contact your GP or lifeline on 13 11 14. The benefits may include a greater understanding of why people practice yoga and playing a role in the development of a broader research project exploring the role of yoga on mental health and well-being.

You are invited to participate in this online survey and distribute a hard copy or online student survey to your class. Participation is voluntary and you may choose to withdraw at any time.

You will be provided with the findings of the final research project.

Volunteer yoga teachers are sought for Phase 2 of the project to teach a tailor designed yoga course to mental health consumers, over 8-10 weeks in 2015. If you have an interest in yoga and mental health and can volunteer your time to teach this yoga course to people with a chronic mental health condition, please register your interest via Nicole.butterfield@adelaide.edu.au

Anonymity and confidentiality

Your name and some personal details will be required for this research project but your yoga students will remain anonymous. The Yoga Teacher Survey you complete will be linked to the Yoga Students Survey via a code. On completion of the research **we will remove these details from the data** that will be stored securely for five years. Any potential identifying data will not be used in the reporting of this research; only aggregate results will be analysed and presented. The data is confidential and only the research team will have access.

Compliance with NHMRC National Statement

The research will be conducted according to the NHMRC National Statement on Ethical Conduct in Human Research, 2007.

Contacts

This research project has been approved by the Human Research Ethics Committee of the University of Adelaide. Should you wish to discuss the study with someone not directly involved in the study, contact the Secretariat, Human Research Ethics Committee, University of Adelaide, 8313 6028 or hrec@adelaide.edu.au.

Please find attached a copy of the independent complaints form if required. Should you require further details about the study, either before, during or after the study, you may contact the researchers below:

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YOGA IN SA TEACHERS SURVEY Yoga Code (Office use only) ☐

Thank you for your involvement in this important research, which is part of a PhD research project at the University of Adelaide examining the role of yoga in mental health and well-being.

There are two surveys, including one for yoga participants and the other for yoga teachers, which make up phase 1 of the research project. The following survey is aimed at yoga teachers and includes two parts, Part 1: Demographics Part 2: Yoga teaching style and experience. The survey should take 10-15 minutes to complete.

PART 1: DEMOGRAPHICS

Please answer the following questions:

1. **What is your age?** (Select ONE option)

☐ 18-24 ☐ 45-54

☐ 25-34 ☐ 55-64

☐ 35-44 ☐ 65+

2. **What is your gender?** (Select ONE option)

☐ Female ☐ Male

3. **Do you identify with any of the following religions?** (Select ALL that apply)

☐ Buddhism ☐ Islam

☐ Christian ☐ No religion

☐ Hindu ☐ Other, please specify.....

PART 2: YOGA TEACHER EXPERIENCE AND CLASS PRACTICE

Please provide a NUMERICAL value for the following questions:

4. **How many yoga classes do you teach per week?** ☐

5. **How long have you been teaching yoga?** ☐ Years ☐ Months

6. **How long have you been practising yoga?** ☐ Years ☐ Months

Please answer the following questions:

7. **What is your level of yoga teaching qualification in Australia?** (Select ONE option)

☐ Provisional (200 hr)

☐ Level 1 (350 hr)

☐ Level 2 (500 hr)

☐ Level 3 (1000 hr)

☐ Other, please specify.....

8. **Are you an accredited Yoga teacher?** (Select ONE option)

☐ Yes ☐ No

9. **Are you accredited with Yoga Australia?** (Select ONE option)

☐ Yes ☐ No

10. **Are you accredited with Yoga Alliance?** (Select ONE option)

☐ Yes ☐ No

11. **Are you accredited with the International Yoga Teachers Association?** (Select ONE option)

☐ Yes ☐ No

12. **Are you accredited with any other yoga organisation?** (Select ONE option)

☐ Yes ☐ No

If yes, please specify……

13. **Are you accredited with Fitness Australia as a yoga teacher?** (Select ONE option)

☐ Yes ☐ No

14. **Are you a member of the Yoga teachers Institute of South Australia?** (Select ONE option)

☐ Yes ☐ No

15. **What style/s of yoga do you teach?** (Select ALL styles of yoga that you teach)

☐ Hatha (general gentle yoga involving physical postures)

☐ Vinyasa (flowing style of yoga including sun salutation sequence)

☐ Ashtanga (Fast paced rigourous yoga that follows a specific sequence of postures)

☐ Iyengar (Yoga style focused on alignment and use of props)

☐ Bikram (hot yoga in heated room, specific sequence of postures)

☐ Other, please specify.....

16. **Of all the styles of yoga selected in Q15, what is the <u>main</u> style of yoga that you teach?** (Select ONE option)

☐ Hatha (general gentle yoga involving physical postures)

☐ Vinyasa (flowing style of yoga including sun salutation sequence)

☐ Ashtanga (Fast paced rigourous yoga that follows a specific sequence of postures)

☐ Iyengar (Yoga style focused on alignment and use of props)

☐ Bikram (hot yoga in heated room, specific sequence of postures)

☐ Other, please specify.....

17. What components are included in the typical yoga classes you teach? (Select ALL that apply)

- ☐ Asana (postures)
- ☐ Breathwork (Pranayama)
- ☐ Meditation/Yoga Nidra/Shavasana
- ☐ Candles/incense/oil burners
- ☐ Chanting
- ☐ Spiritual teachings
- ☐ Music
- ☐ Other, please specify.....

18. Why do you practise yoga? (Select ALL that apply)

- ☐ Health or fitness benefits
- ☐ Spiritual or personal growth
- ☐ Stress management
- ☐ Reduce or manage anxiety
- ☐ Reduce or manage depression
- ☐ Other, please specify.....

Appendix 4. Phase 2 – Yoga student survey

PARTICIPANT INFORMATION SHEET

Yoga in South Australia Research Project (Ethics Approval no. H-2014-141)

Dear Yoga Student

Thank you for your interest in the 'Yoga in South Australia' research project. You have received this information sheet as your yoga class is taking part in phase 1 of the project. This survey is part of a PhD research project at the University of Adelaide exploring yoga and mental health.

The aim of the Yoga Student Survey is to examine the practice and personal characteristics of current yoga participants aged 18 years and over. You will also be asked to complete questionnaires concerning mindfulness (paying attention to the present moment), self-compassion (the integration of self-kindness, a sense of common humanity and mindfulness), stress, anxiety, depression and well-being.

You are invited to participate in the research project by completing a survey. Participation is voluntary and you may choose to withdraw at any time. Your involvement will entail completing a 15-20 minute anonymous hard copy survey provided by your yoga teacher and returned to them in person. Completion of the survey will indicate your consent to be involved in the project.

It is not anticipated that there will be any risks associated with participating in this project. However, if you experience any psychological distress during or after completing the survey we recommend you contact your GP or lifeline on 13 11 14. The benefits may include playing a role in the development of a broader research project exploring the role of yoga on mental health and well-being.

If you are interested in the findings of the survey and final research project please register your interest via Nicole.butterfield@adelaide.edu.au.

PLEASE NOTE: This survey is uniquely coded to your yoga class and must not be given to anyone else

Anonymity and confidentiality

The survey is anonymous and your name and personal details will not be required for this research project. However, your yoga teacher/class will be identified and linked to the survey you complete via a code. On completion of the research **we will remove these details from the data** that will be stored securely for five years. Any potential identifying data will not be used in the reporting of this research; only aggregate results will be analysed and presented. The data is confidential and only the research team will have access.

Compliance with NHMRC National Statement

The research will be conducted according to the NHMRC National Statement on Ethical Conduct in Human Research, 2007.

Contacts

This research project has been approved by the Human Research Ethics Committee of the University of Adelaide. Should you wish to discuss the study with someone not directly involved in the study, contact the Secretariat, Human Research Ethics Committee, University of Adelaide, phone 8313 6028 or email hrec@adelaide.edu.au. The independent complaints form may be accessed if required at www.adelaide.edu.au/ethics/human/guidelines/applications/complaints.doc

Should you require further details about the study, either before, during or after the study, you may contact the researchers listed below:

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YOGA IN SA STUDENT SURVEY Yoga Code

Thank you for your involvement in this important research, which is part of a PhD research project at the University of Adelaide examining the role of yoga on mental health and well-being.

There are two surveys, including one for yoga students and the other for yoga teachers, which make up phase 1 of the research project. The following survey is aimed at yoga students and includes three parts, Part 1: Demographics Part 2: Yoga practice Part 3: Mental Health Questionnaires. The survey should take 15-20 minutes to complete. Please answer ALL questions.

PART 1: DEMOGRAPHICS

Please answer the following questions by marking the selected box with an **X**

1. **What is your age?** (Select ONE option)

   ☐ 18-24 ☐ 45-54

   ☐ 25-34 ☐ 55-64

   ☐ 35-44 ☐ 65+

2. **What is your gender?** (Select ONE option)

   ☐ Female ☐ Male

3. **What is your postcode?**

4. **What is your current level of employment?** (Select ONE option)

   ☐ Full-time employment ☐ Retired

   ☐ Part-time/casual employment ☐ Unemployed

   ☐ Student ☐ Other, please specify.....

5. **If employed, please select the area that best describes your main employment** (Select ONE option)

   ☐ Healthcare ☐ Welfare/Community service

   ☐ Education ☐ Industry/Labour work

   ☐ Retail/Customer service ☐ Other, please specify.....

6. **What is the highest level of education you have achieved?** (Select ONE option)

   ☐ Did not finish high school ☐ University (Bachelor degree)

   ☐ Finished year 12 ☐ Postgraduate

   ☐ TAFE ☐ Other, please specify.....

PART 2: YOGA PRACTICE

7. **How long have you been practising yoga?** (Please provide NUMERICAL values)

   ☐ Years ☐ Months

8. **Are you a yoga teacher or in yoga teacher training?** (Select ONE option)

   ☐ Yes ☐ No

9. **What style/s of yoga class do you attend?** (Select ALL styles of yoga class you attend)

   ☐ Hatha (General gentle yoga class involving physical postures and some meditation)

   ☐ Vinyasa (Flowing style yoga class with sun salutation sequence)

   ☐ Ashtanga (Fast paced rigourous yoga that follows a specific sequence of postures)

   ☐ Iyengar (Yoga style focused on alignment and use of props)

   ☐ Bikram (hot yoga in heated room, specific sequence of postures)

   ☐ Other, please specify.....

10. **What is the <u>main</u> style of yoga class you attend?** (Select ONE option as the <u>main</u> style of yoga class you attend)

    ☐ Hatha (General gentle yoga class involving physical postures and some meditation)

    ☐ Vinyasa (Flowing style yoga class with sun salutation sequence)

    ☐ Ashtanga (Fast paced rigourous yoga that follows a specific sequence of postures)

    ☐ Iyengar (Yoga style focused on alignment and use of props)

    ☐ Bikram (hot yoga in heated room, specific sequence of postures)

    ☐ Other, please specify.....

11. **Where do you practise yoga?** (Select ALL the locations that you practise yoga)

    ☐ Yoga Studio/Centre ☐ Private class

    ☐ Community centre ☐ Home

    ☐ Gym/Fitness centre ☐ Other, please specify.....

12. **Where is the <u>main</u> place that you practise yoga?** (Select ONE option as the <u>main</u> place that you practise yoga)

    ☐ Yoga Studio/Centre ☐ Private class

    ☐ Community centre ☐ Home

    ☐ Gym/Fitness centre ☐ Other, please specify.....

13. What components are included in the typical yoga classes you attend? (Select ALL options that apply)

- ☐ Postures (Asana)
- ☐ Breath-work (Pranayama)
- ☐ Meditation/Yoga Nidra/Shavasana
- ☐ Candles/incense/oil burner
- ☐ Chanting
- ☐ Spiritual teachings
- ☐ Music
- ☐ Other, please specify.....

14. If you practice yoga at home what best describes your typical home practice? (Select ONE option)

- ☐ 10-30 min sun salutation
- ☐ Gentle Hatha practice
- ☐ Dvd/Cd/podcast/TV/Wii Fit
- ☐ Practice of specific postures/poses
- ☐ Moderate intensity hatha practice
- ☐ Other, specify.....

15. In the last 3 months, on average how many classes have you attended per week? (Select ONE option)

- ☐ Less than once a week
- ☐ Once a week
- ☐ 2-3 classes a week
- ☐ 4-6 classes a week
- ☐ 7 or more classes a week

16. What length of time (A) are the class/classes that you attend in a typical week and how many (B)?

Select ALL class time lengths you attend (A) and record the corresponding number of classes (B)

A. Time (select)	B. Classes (number)
☐ <30 min	
☐ 30-60 min	
☐ 60-90 min	
☐ > 90 min	

For Example:

A. Time (select)	B. Classes
☐ <30 min	0
☑ 30-60 min	2
☑ 60-90 min	1
☐ > 90 min	0

17. Why do you practise yoga? (Select ALL that apply)

- ☐ Health or fitness benefits
- ☐ Spiritual or personal growth
- ☐ Stress management
- ☐ Reduce or manage anxiety
- ☐ Reduce or manage depression
- ☐ Other, please specify.....

18. Do you regularly practise any other form of exercise or mind-body programs? (Select ALL that apply)

- ☐ Meditation
- ☐ Tai Chi/ Qui Dong
- ☐ Strength training
- ☐ Low intensity cardio (eg. walking, gentle swim/jog)
- ☐ Mod-high intensity cardio (eg. running, cycling, swim)
- ☐ Other, please specify.....

19. Are you currently experiencing any of the following health conditions? (Select ALL that apply)

- ☐ Anxiety
- ☐ Asthma
- ☐ Bipolar Affective Disorder
- ☐ Cancer
- ☐ Depression
- ☐ Diabetes
- ☐ Heart disease or heart/cardiovascular condition
- ☐ Osteoporosis, Arthritis or bone/joint condition
- ☐ Schizophrenia or Psychotic disorder
- ☐ No, I do not have any current health problems
- ☐ Other, specify.....

PART 3: SURVEY TOOLS

20. FIVE FACET MINDFULNESS QUESTIONNAIRE: SHORT FORM

This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

_____ 1. I am good at finding the words to describe my feelings

_____ 2. I can easily put my beliefs, opinions, and expectations into words.

_____ 3. I watch my feelings without getting lost in them.

_____ 4. I tell myself I shouldn't be feeling the way I'm feeling.

_____ 5. It's hard for me to find the words to describe what I'm thinking.

_____6. I pay attention to sensations, such as the wind in my hair or sun on my face.

_____ 7. I make judgments about whether my thoughts are good or bad.

_____8. I find it difficult to stay focused on what's happening in the present.

_____ 9. When I have distressing thoughts or images, I don't let myself be carried away by them

_____ 10. Generally, I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing

_____ 11. When I feel something in my body, it's hard for me to find the right words to describe it

_____ 12. It seems I am "running on automatic" without much awareness of what I'm doing.

_____13. When I have distressing thoughts or images, I feel calm soon after.

_____ 14. I tell myself that I shouldn't be thinking the way I'm thinking.

_____ 15. I notice the smells and aromas of things.

_____ 16. Even when I'm feeling terribly upset, I can find a way to put it into words.

_____ 17. I rush through activities without being really attentive to them.

_____ 18. Usually when I have distressing thoughts or images I can just notice them without reacting.

_____ 19. I think some of my emotions are bad or inappropriate and I shouldn't feel them.

_____ 20. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.

_____ 21. When I have distressing thoughts or images, I just notice them and let them go.

_____ 22. I do jobs or tasks automatically without being aware of what I'm doing.

_____ 23. I find myself doing things without paying attention.

_____ 24. I disapprove of myself when I have illogical ideas.

21. SELF COMPASSION SHORT FORM SCALE

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never				Almost always
1	2	3	4	5

_____1. When I fail at something important to me I become consumed by feelings of inadequacy.

_____2. I try to be understanding and patient towards those aspects of my personality I don't like.

_____3. When something painful happens I try to take a balanced view of the situation.

_____4. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

_____5. I try to see my failings as part of the human condition.

_____6. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____7. When something upsets me I try to keep my emotions in balance.

_____8. When I fail at something that's important to me, I tend to feel alone in my failure

_____9. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____11. I'm disapproving and judgmental about my own flaws and inadequacies.

_____12. I'm intolerant and impatient towards those aspects of my personality I don't like.

22. . DEPRESSION ANXIETY AND STRESS SCALE 21

DASS21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you ***over the past week***. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (eg, in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

23. KEYES 14-ITEM ADULT MENTAL HEALTH CONTINUUM-SHORT FORM (ages 18 or older)

Please answer the following questions about how you have been feeling by circling the number that best represents how often you have experienced or felt the following in the ***past month***:

0 Never
1 Once or twice
2 About once a week
3 About 2 or 3 times a week
4 Almost everyday
5 Everyday

1. Happy	0	1	2	3	4	5
2. Interested in life	0	1	2	3	4	5
3. Satisfied with life	0	1	2	3	4	5
4. That you had something important to contribute to society	0	1	2	3	4	5
5. That you belonged to a community (like a social group, or your neighbourhood)	0	1	2	3	4	5
6. That our society is a good place, or is becoming a better place, for all people	0	1	2	3	4	5
7. That people are basically good	0	1	2	3	4	5
8. That the way our society works makes sense to you	0	1	2	3	4	5
9. That you liked most parts of your personality	0	1	2	3	4	5
10. Good at managing the responsibilities of your life	0	1	2	3	4	5
11. That you had warm and trusting relationships with others	0	1	2	3	4	5
12. That you had experiences that challenged you to grow and become a better person	0	1	2	3	4	5
13. Confident to think or express your own ideas and opinions	0	1	2	3	4	5
14. That your life has a sense of direction or meaning to it	0	1	2	3	4	5

Thank you!

Thank you for participating in the Yoga Student Survey. The results of the teacher and student surveys will be used to develop an intervention to explore the role of yoga on mental health and wellbeing for people with anxiety and depression and a chronic mental health condition. Your involvement in this research project is important.

If you have any further enquiries please email Nicole.butterfield@adelaide.edu.au

Appendix 5. Phase 2 – Ethics Approval

THE UNIVERSITY of ADELAIDE

RESEARCH BRANCH
OFFICE OF RESEARCH ETHICS, COMPLIANCE AND INTEGRITY

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CRICOS Provider Number 00123M

18 July 2014

Dr T Schultz
School: School of Nursing

Dear Dr Schultz

ETHICS APPROVAL No: **H-2014-141**

PROJECT TITLE: **Are yoga practice, mindfulness and self-compassion related, and are there relationships with stress, anxiety, depression and well-being?**

The ethics application for the above project has been reviewed by the Low Risk Human Research Ethics Review Group (Faculty of Health Sciences) and is deemed to meet the requirements of the *National Statement on Ethical Conduct in Human Research (2007)* involving no more than low risk for research participants. You are authorised to commence your research on **18 Jul 2014**.

Ethics approval is granted for three years and is subject to satisfactory annual reporting. The form titled *Project Status Report* is to be used when reporting annual progress and project completion and can be downloaded at http://www.adelaide.edu.au/ethics/human/guidelines/reporting. Prior to expiry, ethics approval may be extended for a further period.

Participants in the study are to be given a copy of the Information Sheet and the signed Consent Form to retain. It is also a condition of approval that you **immediately report** anything which might warrant review of ethical approval including:

- serious or unexpected adverse effects on participants,
- previously unforeseen events which might affect continued ethical acceptability of the project,
- proposed changes to the protocol; and
- the project is discontinued before the expected date of completion.

Please refer to the following ethics approval document for any additional conditions that may apply to this project.

Yours sincerely,

Amy Weckert
Human Research Ethics Officer
Office of Research Ethics, Compliance and Integrity

THE UNIVERSITY of ADELAIDE

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CRICOS Provider Number 00123M

Applicant: Dr T Schultz

School: School of Nursing

Project Title: Are yoga practice, mindfulness and self-compassion related, and are there relationships with stress, anxiety, depression and well-being?

The University of Adelaide Human Research Ethics Committee
Low Risk Human Research Ethics Review Group (Faculty of Health Sciences)

ETHICS APPROVAL No: H-2014-141 **App. No.: 0000019143**

APPROVED for the period: 18 Jul 2014 to 31 Jul 2017

Thank you for your response dated 16.07.2014 to the matters raised. This study is to be conducted by Nicole Butterfield, PhD student.

Amy Weckert
Human Research Ethics Officer
Office of Research Ethics, Compliance and Integrity

Appendix 6. Published Paper 3

International Journal of Mental Health Nursing

International Journal of Mental Health Nursing (2020) ••, ••–•• doi: 10.1111/inm.12694

ORIGINAL ARTICLE

The practicability and relevance of developing a yoga intervention for mental health consumers: A qualitative study

***Nicole Snaith,*[1] *Philippa Rasmussen,*[1] *Tim Schultz*[1] *and Michael Proeve*[2]**

[1]*Adelaide Nursing School, and* [2]*School of Psychology, University of Adelaide, Adelaide, South Australia, Australia*

ABSTRACT: *The aim of the study was to understand the perspectives of mental health consumers, staff, and yoga teachers on the characteristics of a yoga-based intervention to be developed for consumers with a long-term mental health condition, in addition to anxiety and/or depression. Two focus groups were held with mental health consumers (n = 8), two focus groups with mental health staff (n = 13) from a metropolitan community mental health setting, and five one-on-one interviews with yoga teachers. Participants were asked about the feasibility and appropriateness of a range of yoga practice features to be tested as a newly developed yoga-based intervention. Thematic analysis was used to identify themes. Findings included the following consumer themes: Mental health understanding and experience of teachers and participants is important, Creating a safe space and Yoga practice elements. Staff themes included Mental health understanding and experience of teachers is important, Environmental design, and Yoga practice elements. Yoga teacher themes included Environmental design and Yoga practice elements. Mental health understanding and experience of the yoga teacher, and trauma-informed care were consistently emphasized by consumers and staff. Teachers focused less on specific mental health considerations, which may be reflective of a broader knowledge gap. Recommendations regarding yoga practice elements, including pre-information, regular and consistent practice, modifications, breathwork, mindfulness and guided practice, and environmental design features, were consistent with current trauma-informed yoga research. Findings will be used to guide the development of a yoga-based intervention for consumers with a long-term mental health condition, in addition to anxiety and/or depression.*

KEY WORDS: *anxiety, depression, intervention, mental health consumers, qualitative study, Yoga.*

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Authorship statement: All authors listed meet the authorship criteria according to the latest guidelines of the International Committee of Medical Journal of Editors. All authors were involved in the design and conceptualization of the study. NS conducted the study and drafted the manuscript. NS and PR contributed to the data analysis. All authors were involved in manuscript revisions and read and approved the final manuscript.

Declaration of conflict of interest statement: The authors declare that they have no competing interests.

Nicole Snaith, BSc (Hons), RN, MHN, MMHN, PhD Candidate.
Philippa Rasmussen, RN, MHN, GradCertHealth, GradDipPsychStudies, MN, PhD.
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Accepted January 02 2020.

INTRODUCTION

Yoga-based interventions are increasingly being recognized as an effective adjunct therapy for a range of mental health conditions, including anxiety (Cramer *et al.* 2013; Kirkwood & Rampes 1995; Uebelacker & Broughton 2016), depression (Cramer *et al.* 2013; de Manincor *et al.* 2016; Pilkington *et al.* 2005; da Silva *et al.* 2009), stress (Penman 2008; Varambally & Gangadhar 2012), and trauma (van der Kolk *et al.* 2014). The physiological and psychological mechanisms of yoga practice on the stress response and proposed mental health outcomes are illustrated in the yoga and mental health model developed by Butterfield *et al.* (2017). This model describes proposed positive changes of yoga practice on the parasympathetic nervous system and development of psychological skills such as mindfulness and self-compassion, which in turn may lead to reduced anxiety and depression.

The mindfulness aspects of yoga are thought to be particularly beneficial for symptoms of anxiety and depression by facilitating emotional regulation (Bussing *et al.* 2012; Davidson *et al.* 2003; Uebelacker & Epstein-Lubow 2010). Yoga focuses on the sensory experience of body and breath awareness; learning to notice, tolerate, and manage physical sensations; and regulate the autonomic nervous system (van der Kolk *et al.* 2014).

Yoga may appeal to mental health consumers due to concerns regarding side effects, stigma, and cost of traditional pharmaceutical therapies (Macy *et al.* 2015). However, accessing yoga in the general community may be difficult for people with a long-term mental health condition (Psychotic or mood disorder) due to perceived stigma, symptoms of their illness such as auditory or visual hallucinations, paranoia, dissociation, self-consciousness, high levels of anxiety, and/or side effects of medication. Experiences of trauma, cost, and access may also be barriers. There is minimal research evidence or existing protocols for designing yoga-based interventions specifically for mental health consumers with a long-term mental health condition, in addition to anxiety and/or depression.

This paper presents the second phase of a PhD research project on yoga and mental health, which involved consultation with mental health consumers and staff and yoga teachers in designing a yoga-based intervention. Phase one involved surveys to yoga teachers and students on their yoga practice and teaching experience, yoga practice characteristics, and psychological and mental health measures.

The aim of this study was to understand the perspectives of mental health consumers, staff, and yoga teachers on the characteristics of a yoga-based intervention to be developed for mental health consumers with a long-term mental health condition (Psychotic or mood disorder) in addition to anxiety and/or depression. This research provides a platform for an exciting new direction in nursing practice to work collaboratively with alternative therapies in providing evidence-based care.

METHODS

A qualitative descriptive study was conducted to understand the perspectives of mental health consumers, staff, and yoga teachers on the characteristics of a yoga-based intervention to be developed for mental health consumers with a long-term mental health condition in addition to anxiety and/or depression. Focus groups were undertaken with mental health consumers and staff from a metropolitan community mental health setting and interviews with South Australian yoga teachers from October 2016 until April 2017.

Ethics approval was gained from the Southern Adelaide Clinical Research Ethics Committee and the University of Adelaide.

Focus group and interview questions included what is feasible and appropriate for people with a long-term mental health condition regarding:

1. Yoga practice class duration, frequency, intensity, and components
2. Home practice
3. Environmental features of the room
4. Teacher qualities
5. Recruitment strategies
6. Data collection

Participants

Mental health consumers

Mental health staff received an email from the sector manager, introducing the research project, and inviting them to identify consumers who meet the inclusion/exclusion criteria. Suitable consumers were then invited to participate in a focus group by their care coordinator. Information flyers were also displayed in the waiting area of the Community Mental Health Service to recruit consumers, who then needed to speak with their care coordinators to register their interest. The consumer's community mental health team discussed

the project requirements and consented participants. Two focus groups were held with a total of eight participants.

The inclusion criteria for mental health consumers were that they were mental health consumers of a specific metropolitan community mental health setting; medically and mentally stable and not experiencing significant health problems, stressors or treatment regimes that may impact on, be affected, or worsened by participation, as deemed by the consumer's treating mental health team; self-report experiencing anxiety and/or depression, cognitively able to understand basic instructions related to yoga practice; and able to give informed consent to participate and not pregnant. Participants were included regardless of previous or current experience with yoga.

Mental health staff

Mental health staff were invited by email to participate in a focus group. Mental health staff were invited to participate in the focus groups dues to their knowledge and experience in working with mental health consumers and trauma-informed care.

Two focus groups were held with a total of 13 participants. Inclusion criteria were that they were clinical mental health staff, including nurses, occupational therapists, and social workers, working with consumers in a metropolitan community mental health setting and available to participate in a focus group on the days and times allocated.

Yoga teachers

Yoga teachers who had already registered their interest in participating in this phase of the research project as part of a previous study (Snaith *et al.* 2018) were contacted by email and invited to participate in a phone interview. Interviews were conducted with the yoga teachers as a focus group was too difficult to organize with their varying schedules and locations, including country areas.

Five yoga teachers were interviewed. Inclusion criteria for yoga teachers were that they were part of the initial study, had registered their interest in participating in the next phase of the research, and were available for a one-on-one interview within a specific timeframe. The qualifications and experience of yoga teachers included one provisional teacher (200 hours), two level one (350 hours), one level two (500 hours), and one level 3 (1000 hours), as per Yoga Australia training requirements. Mental health experience was not a prerequisite as this would have significantly limited the sample size and is not an accurate representation of yoga teachers.

Data analysis

Recordings of the focus groups and interviews were transcribed, and thematic analysis undertaken. Thematic analysis comprises identification, analysis, and interpretation of patterns of meaning (themes) in data (Braun & Clark 2006; Clark & Braun 2017). Thematic analysis was the most appropriate data analysis for this study due to its flexibility with research question, sample size, data collection, and approaches (Clark & Braun 2017; Roulston 2001). Specifically, this study used the Braun and Clark (2006) six-step thematic analysis process: becoming familiar with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. The focus group and interview recordings were transcribed verbatim by author NS. Transcripts were read through several times and initial codes generated by author NS. Step three and four involved searching for themes and refining them by authors NS and PR. The essence of the themes was then discussed, finalized, and defined with all authors.

RESULTS

Consumer themes

Consumer themes included 'Mental health understanding and experience of the teacher and participants is important', 'Creating a safe space' and 'Yoga practice elements' and a total of 11 sub-themes (Table 1). The themes will be discussed separately and in no hierarchy of importance.

Mental Health understanding and experience of the teacher and participants is important

Consumers consistently emphasized the importance of the yoga teacher understanding and having experience in mental health. One consumer explained:

> If you feel like you are going to have a panic attack or dissociate or on a thought train...having someone directing you who is aware of that kind of stuff. (1)

A yoga teacher who knows how to support and guide participants through mental health symptoms and experiences was considered important.

The relationship between the teacher and participant was also highlighted by consumers. One consumer

described: 'You want to know your instructor and feel comfortable with your instructor, so if you are having any problems you can discuss these' (2). Similarly, support and personal follow-up from the yoga teacher was viewed as valuable. For example, one consumer suggested: 'A follow up call would be a good thing if missed class – just "are you ok," no pressure to return' (6). Developing a therapeutic relationship and rapport between teachers and consumers was considered essential for their ongoing participation.

Consumers also identified the relationship with other participants as important. One consumer explained: 'I think that if there is a group focus of being with similar stories and issues, there would be that understanding that it is really hard for us' (1). Other participants (3, 8) agreed with this statement. The shared experience of doing yoga with mental health peers was emphasized as important for consumers to feel comfortable in the yoga class.

Anxiety was identified as a common barrier to participating in a yoga class. One consumer explained: 'Most of us from trauma have high fears levels. . .what if. . .what if they think I have done that the wrong way or the wrong place. . .then don't do anything' (5). Consumers identified anxiety about the course and meeting other participants as a barrier to attendance, which they generally felt could be eased by a pre-information session to help them feel prepared.

Creating a safe space

The need to feel safe in the physical environment of the room, during yoga practice and with other participants, was a consistent theme. Consumers generally agreed that the room should be private, quiet, soft but not too dim lighting, and adequate personal space.

Consumers also spoke of knowing the other participants and feeling safe around them. One consumer described: 'With mental health, you feel a little bit more comfortable, cos you're with people who like know you are going through stress and stuff'. (3). Suggesting again that the shared group experience of yoga and building rapport with other participants is important for participants to feel safe in class.

Avoiding physical adjustments and contact by the teacher was also highlighted as a personal space and safety issue. One participant explained:

> Touching and stuff like that, you know what I mean. Like I want help but if it's just someone randomly walking past me and going ok (demonstrates physical adjustments). I'm like ok 'get your hands off please. Often they don't ask permission – I'm like personal space please people. (1)

Gender of group participants was raised as an issue by consumers and some reported that they may not feel comfortable with males in the group. One consumer rationalized:

> I don't know how I would feel about a male, a mixed group –. Being in a dark room with males, I would probably really struggle with that - especially if you've had trauma issues. (1)

Indicating that a yoga group with male participants may not be appropriate for some female consumers or those who have experienced trauma such as sexual assault.

Yoga practice elements

Consumers generally agreed that a yoga course of 30- to 60-min classes twice per week over 10 weeks during the school term and with guided home practice was appropriate.

The importance of regular yoga practice and increasing practice duration and intensity over time was emphasized. One consumer explained: 'I think to start with I probably, even though it might seem hard, I'd probably want somewhere I went twice a week, so I am learning and creating that habit' (1). However, others felt this was unrealistic, and one consumer stated: 'Getting to a class I would only commit to once a week – that's only because of my lifestyle at the minute' (4). There was more of a consensus over class

TABLE 1: *Consumer themes and sub-themes*

Theme	Sub-theme
Mental health understanding and experience of the teacher and participants is important	Mental health understanding and experience
	Relationship with the teacher
	Relationship and shared experience with peers
	Anxiety and feeling prepared
Creating a safe space	Environmental features
	Knowing and feeling safe with other participants
	Avoid physical adjustments
	Gender of participants
Yoga practice elements	General yoga practice guidelines
	Increasing duration and intensity over time
	Breathwork, mindfulness, and guided practice

duration, and one consumer described: 'Beginners, I'd say 30 min, as you kind of lose interest easily, but over time I think an hour and over is like really good. But I couldn't do that when I first started' (2). Consumers recognized the need to build up yoga practice over time and the importance of consistency to implement it as a lifestyle change.

The importance of breathwork, mindfulness, and guided practice was emphasized by consumers. For example, one consumer explained 'Would be good for stress wouldn't it. . . .breathing and all that. . .that's the first thing I thought of' (7). Some participants spoke more specifically about the importance of mindfulness: 'Teaching mindfulness – emphasising that you are teaching mindfulness' (3). One consumer described the benefits of guided practice and mindfulness for mental health:

> Cos when you're dealing with mental illness and stuff, people have dissociations and stuff like that, they do need that voice to keep you grounded. I struggle to be in the present, so anything that gets you to focus on being in the now is really grounding. (1)

Staff

The themes from staff interviews included 'Mental health understanding and experience of the teacher is important', 'Environmental design' and 'Yoga practice elements' and 11 sub-themes (Table 2).

Mental health understanding and experience of the teacher is important

Staff consistently spoke of the importance of the yoga teacher having an understanding and experience with mental health. One staff member described how a yoga teacher should be: 'Loving, compassionate, accepting of people's mental states as the experience of the individual not the mental health system. A practical example of ahimsa' (3). Other staff spoke about the teacher understanding consumers' specific mental health symptoms and experiences. For example, one staff member explained:

> I know some of my consumers have said when I suggest things like yoga – they've said I'm not quite sure how I'm going to block out the voices whilst I'm doing it. They are worried that the voices are going to become more intense when they are trying to relax. (10)

The importance of the yoga teacher having knowledge and experience in mental health and being able to sensitively guide and support consumers experiencing symptoms and/or side effects of medication was consistently stressed by staff. Subsequently, the relationship between the teacher and the mental health consumer was also considered important. One staff member explained: 'Personal follow up and developing the relationship with the teacher/participant will be important' (5). This was particularly emphasized in relation to recruitment and retention of consumers to the yoga course.

Providing pre-information on the etiquette of yoga, particularly personal hygiene, was considered imperative for this consumer group. One staff member explained:

> Some of the consumers don't shower for weeks, so that might be an issue, but we still want to empower them to participate. (10)

Staff acknowledge the challenges that consumers often face with self-care and hygiene and related barriers to community-based activities, but indicated that providing pre-information may support consumers to prepare and have the confidence to participate.

Environmental design

Mental health staff generally described the ideal yoga room design as quiet with soft lighting, plenty of space, and music. Staff also highlighted the importance of considering a trauma-informed perspective in the yoga room set-up. One staff member explained:

TABLE 2: *Staff themes and sub-themes*

Theme	Sub-theme
Mental health understanding and experience of the teacher is important	Mental health understanding and experience
	Understanding specific symptoms and experiences
	Relationship between teacher and student
	Providing pre-information
Environmental design	Environment and room features
	Trauma-informed perspective
	Participants allowed to choose own mat space
Yoga practice elements	General yoga practice guidelines
	Increasing practice duration and intensity over time
	Modifications
	Breathwork, mindfulness, and meditation

> I think the environment would need to be relevant to the group – especially in considering a trauma informed perspective and understanding that people with long-term mental distress are likely to have experiences in trauma in different environments. That said, introducing experiences that are safe is positive in overcoming negative environments. (3)

This suggests that it is important to know the participants' backgrounds, to minimize triggering traumatic experiences but also to facilitate space for a positive experience in potentially traumatic environments such as group settings. Similarly, the yoga teacher allowing participants to choose their own mat space was a strong theme. For example, one staff member described:

> Yes, definitely good to be able to choose yourself where you are because I know being a beginner person, I didn't want everyone to see how crap I was at it and I didn't want to be squished in. That relaxation sort of thing of not being rushed and being able to choose your spot so you don't feel intimidated that everyone is going to look at you. (10)

Suggesting that consumers being able to choose where they place their mat may help ease anxiety but also relates to the importance of having a choice and control over their practice from a trauma-informed perspective.

Yoga practice elements

Mental health staff generally agreed that working up to a 45- to 60-min class twice per week, short optional home practice, and 10-week yoga course during the school terms would be most appropriate for this consumer group.

Yoga class frequency was a discussion point amongst staff with differing views between one or two classes per week. One staff member explained: 'I would have thought once a week but twice if achievable, as may create more of a routine' (4). Similarly, another staff member rationalized: 'Twice a week may actually increase it (attendance), because it's a bit like exercise, if you go to the gym and it makes you feel good then you are looking forward to going back again' (12). However, some staff suggested twice a week may be too much for some consumers depending on their commitments.

Staff generally acknowledged that while twice per week yoga classes may not be achievable for all consumers, it is important to offer this to consumers in order to encourage them to create a lifestyle change and to develop a yoga routine.

Home practice was recommended by most staff but there were concerns over the delivery and adherence. For example, one staff member suggested: 'I think daily practice... you could maybe give them the information and if they want to do at home, but I don't know whether it would actually be done' (7). Several staff (6, 8, 9, 11, 12, 13) agreed with this statement. Staff were generally keen to avoid the concept of 'homework' and suggested that optional and guided home practice may be more achievable for consumers, but that adherence may still be an issue.

Increasing yoga practice intensity and duration over time was a consistent theme. For example, one staff member suggested: 'A really gentle intro on the first day and explanation that things will become more familiar with repetition, so that participants feel more confident with what is coming' (2). Similarly, in regard to class duration another staff member emphasized: 'I still think 60 minutes is most achievable, people would be put off even going if they knew it was 90 minutes' (1). Staff emphasized that consumers need time to build up confidence and familiarity, along with the duration and intensity of their yoga practice.

Breathwork, mindfulness, and meditation were highlighted as important components of the yoga practice. One staff member described the essential elements of the yoga class as, 'Breathwork and mindfulness and learning to stay present moment focused' (5). Most staff identified breathwork and many mindfulness or meditation as important for grounding and focusing participants during yoga practice.

Modifications to practice and the use of props (equipment) for yoga practice were considered particularly important for this consumer group. One staff member described:

> I think having the modified things. Where it's an environment where it's not like you are doing it right or wrong and you're not "failing" and things like that. You're all, everyone is at a different stage. (11)

Staff suggested that providing modifications and options (For example. intensity or type of posture) to suit individual needs as well as the use of props, such as blocks and bolsters, may support consumers to feel a sense of self achievement and acceptance of where they are in their yoga journey.

Yoga teachers

The themes derived from yoga teacher interviews included Environmental design and Yoga practice elements and six sub-themes (Table 3).

Environmental design

Environmental design of the yoga room and class was a common consideration by yoga teachers. One teacher described: 'Indoors, safe, quiet and calm space to be able to go within, room pre-setup, soft lighting. A very calm, well prepared and welcoming space and teacher' (1). One teacher had some experience in mental health explained:

> Having volunteered in mental health inpatient there are definitely things that need modifying to a general yoga class, for example smaller groups (4-10) much better, larger groups can up people's anxiety before they start. (5)

Teachers consistently emphasized the need for a quiet, calm, and safe space, but also acknowledged some modifications may be required for mental health consumers.

The importance of creating a community feel and participants experiencing a sense of belonging was highlighted by yoga teachers. One teacher suggested:

> Create a safe and welcoming community. Offer tea, simple snack food after class to stay back and get to know one another. Give time to get to know the students and a space where they can mingle. (1)

Teachers emphasized the social aspects of the yoga class and the feeling of 'belonging' to a community as important to encourage participants to continue attending and commit to a regular yoga practice.

Yoga practice elements

Teachers suggested that working up to a 75- to 90-min yoga class, one to two times per week and home practice over 10 weeks would generally be suitable for this consumer group. For example, one teacher explained: '90 minutes is a bit too long, 1hr 15min, keep the flow going with clear directions and not hurried. Twice per week in class and home practice with guided audio' (3). Teachers consistently emphasized the importance of regular practice, home practice, and a longer class duration.

Yoga teachers emphasized guided breathwork, meditation, and mindfulness, as important elements of yoga practice. One teacher explained: 'Breathwork is very important to get full benefits of yoga, asana/postures, meditation and/or yoga nidra' (1). Another detailed more specific breathwork and guided practices: 'Yoga nidra, diaphragmatic breathing, belly breath, and participants "not left alone with own stuff"' (4). Mindfulness practices were commonly emphasized, and one teacher described: 'Keep things simple, basic asanas, basic breath techniques and shorter relaxations to start. Mindfulness practices on senses, what you can see hear feel etc' (5). Most yoga teachers recommended guided breathwork, meditation, and mindfulness as central to yoga practice for this consumer group.

Yoga teacher characteristics and teaching style were also considered important. One teacher described the ideal yoga teacher as: 'Experienced, confident, welcoming, gentle teaching style with focus on the breath' (1). Another teacher spoke more specifically of the teacher's use of language:

> Able to give options using language that doesn't highlight if they are unable to do something, but rather about making it a choice depending on individual preferences, awareness of their use of language and position in the room. (2)

Teachers indicated the importance of using non-judgemental invitational language, being aware of their body language, and facilitating personal choice with yoga practice.

Providing information was considered a key aspect of the yoga course. One teacher explained: 'Clear information so people know what to expect beforehand as many people have mis-conceptions and a fear of yoga' (2). The importance of preparing and providing information to participants to minimize their anxiety before the yoga course was emphasized.

TABLE 3: *Yoga teacher themes and sub-themes*

Theme	Sub-theme
Environmental design	Environment and room features
	Community and sense of belonging
Yoga practice elements	General yoga practice guidelines
	Breathwork, meditation, and mindfulness
	Yoga teacher characteristics and teaching style
	Providing information

DISCUSSION

Mental health experience and understanding of the yoga teacher was a key finding consistently highlighted by consumers and staff in this study, consistent with other research on yoga for people with anxiety and/or depression (de Manincor *et al.* 2015). Staff and consumers emphasized the need for teachers to guide students experiencing symptoms or side effects of medication in a sensitive and non-judgemental way,

which appears to be a unique finding from this study. Justice *et al.* (2018) discussed the importance of understanding the impact of medication, such as sedation, on yoga participants but not how to support them to manage this in a class environment. The results of this study confirm that implementing a yoga-based intervention needs to consider how to support the mental health of participants. Generally, most research in this area has focused on the recommended yoga practice and teacher characteristics, rather than the individual's mental health experiences and how to integrate them into a yoga practice. Interestingly, yoga teachers in this study did not consider this aspect either, which may indicate limited knowledge and experience in working with people with long-term mental health issues. This may explain why mental health consumers have reported to the lead author that they may find it difficult to access yoga in the general community (N. Snaith, unpublished data, 2017).

The need for a calm, private, and quiet space was a common theme. Staff also focused more specifically on the need for a trauma-informed approach including active participant consultation and choice with room set-up. This is consistent with trauma-informed yoga research, which emphasizes creating safety by encouraging participant engagement in practice space set-up and modifications (Justice *et al.* 2018). Similarly, consumers placed strong emphasis on creating a 'safe space' and minimizing triggers, including avoiding physical adjustments and for some, mixed-gender classes. This also aligns with research on trauma-informed yoga, which suggests physical adjustments and touch can be very traumatic and triggering for people with a history of abuse, sexual assault, or other trauma and that gender dynamics need to be considered in classes (Justice *et al.* 2018). Interestingly, yoga teachers often use physical adjustments in class, suggesting avoiding physical adjustments is an important finding to disseminate within the yoga teaching community.

The need for a regular practice in class and at home is consistent with previous research (de Manincor *et al.* 2015). Although teachers suggested longer classes (90 min) than staff and consumers with experience in mental health (60 min), there is limited information available on the recommended dose of yoga to achieve benefits. In a review article, Sherman (2012) found that most studies of the physical benefits of yoga, suggested 60- to 90-min classes once or twice per week. More recently, de Manincor *et al.* (2015) undertook a Delphi study to design a yoga-based intervention for reducing anxiety and depression, and recommended 30- to 40-min practice five times per week for 6 weeks. Although this research was based on individual yoga sessions rather than group yoga classes, it may provide some guidance on suitable yoga session length for this cohort of consumers.

Breathwork and mindfulness were considered important yoga practice elements by all three participant types in this study and other studies testing breathwork (Brown & Gerbarg 2005; de Manincor *et al.* 2015) and mindfulness (Chiesa & Serretti 2009; Evans *et al.* 2011) for anxiety and depression. Breathwork and meditation (and mindfulness as a specific technique) are important facets of traditional yoga and benefits are reported by yoga practitioners, but are often viewed as separate practices with a focus on physical postures in modern yoga (de Manincor *et al.* 2016). Interestingly, some researchers suggest that mindfulness with bodywork is more successful in treating over-reactive physiological responses learnt through trauma as it focuses on building interoceptive awareness rather than avoidance (Salmon *et al.* 2009). This paper supports the growing research evidence of the importance of practicing yoga as an integrated whole-systems approach, including breathwork, meditation, and postures.

Consumers and staff also spoke of the importance of guided practice and minimal quiet time. Interestingly, this is similar to some aspects of trauma-informed yoga research which recommends guided meditation practices that invite interoception, rather than too much silence and self-reflection time (Justice *et al.* 2018). Similarly, de Manincor *et al.* (2015) recommended guided mindfulness practices as more important than meditation and suggested avoiding meditation without a specific focus in designing a yoga-based intervention for anxiety and depression. The development of interoceptive skills and the ability to self-direct is thought to improve with practice (Farb *et al.* 2015). This study further strengthens the notion that guided practice and less reflective time is important for people with anxiety and depression, and uniquely obtained through the direct insights and experiences of mental health consumers and staff.

The importance of modifications, invitational language, and body language were emphasized by teachers and staff, concepts which are central to trauma-informed yoga (Justice *et al.* 2018). Trauma-informed care, which considers an individual's trauma history, is a focus of contemporary mental health care, and the trauma-informed yoga movement has emerged from these recommendations from the health care profession

(Emerson *et al.* 2009). Trauma-informed yoga is adapted to the individual's needs and aims to create a safe space for participants to learn how to respond to their symptoms and experiences rather then become overwhelmed (Justice *et al.* 2018). An important and emerging finding of this research was the emphasis on trauma-informed care in yoga for mental health consumers with a long-term mental health condition in addition to anxiety and depression, which was highlighted in many elements of yoga practice by staff and consumers, and in some elements by teachers.

Limitations

Recruitment was difficult across the participant types due to staff and teachers' busy schedules and the reliance on staff to recruit consumers. This may have biased consumer participants towards those particularly interested in the study and/or higher functioning consumers. Several of the mental health consumers had a diagnosis of Borderline personality disorder in addition to anxiety or depression, which is a disorder with specific characteristics quite different to the psychosis-based diagnosis also found in this consumer group. Therefore, results may be a less general representation of the consumers who utilize the service.

CONCLUSION

There is minimal research evidence or existing protocols for designing yoga-based interventions specifically for mental health consumers with a long-term mental health condition, in addition to anxiety and/or depression. Therefore, this research project aimed to consult with mental health consumers, staff, and yoga teachers to inform a yoga-based intervention. This was a unique approach which yielded important insight into the perspectives and individual experiences of mental health consumers, staff, and yoga teachers, and how to integrate into a yoga-based intervention, which provides direction for future yoga research, teaching, and practice.

Key findings were the importance of mental health understanding and experience of the yoga teacher, and trauma-informed approaches to environmental design, teaching, and practice. Specific yoga practice elements included the importance of regular and consistent practice, providing pre-information and including modifications, breathwork, mindfulness, and guided practice for this consumer group. Yoga teachers did not identify specific mental health or trauma-informed care needs. The specific components, teaching style and experience and broader underpinnings of the yoga-based intervention will be developed and tested in the next phase of this research project.

RELEVANCE FOR CLINICAL PRACTICE

This innovative nursing led research project provided important information for developing a more mental health aware, including trauma-informed yoga programme for mental health consumers. The consultation process delivered unique insight into the perspectives of mental health consumers, staff, and yoga teachers, which are not usually considered in designing general yoga classes. This research provides a platform for an exciting new direction in nursing practice to work collaboratively with alternative therapies in providing evidence-based care.

ACKNOWLEDGEMENTS

The authors would like to thank the consumers, staff, and yoga teachers involved in the focus groups; GP Plus Noarlunga for use of their facility; Southern Mental Health for ongoing support with the research project; and the Southern Adelaide Clinical Research Ethics Committee.

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Appendix 7. Phase 3 – Ethics Approval

Office for Research

Flinders Medical Centre / The Flats F6/F8
Flinders Drive, Bedford Park SA 5042
Tel: (08) 8204 6453
E: Health.SALHNOfficeforResearch@sa.gov.au

Government of South Australia
SA Health
Southern Adelaide Local Health Network

Final approval for ethics application

You are reminded that this letter constitutes **ethical** approval only. **Ethics approval is one aspect of the research governance process.**
You must not commence this research project at any SA Health sites listed in the application until a Site Specific Assessment (SSA), or Access Request for data or tissue form has been authorised by the Chief Executive or delegate of each site.

18 July 2016

Dr Timothy Schultz
School of Nursing
University of Adelaide
ADELAIDE SA 5005

Dear Dr Schultz

The Southern Adelaide Clinical Human Research Ethics Committee (SAC HREC EC00188) have reviewed and provided ethical approval for this application which appears to meet the requirements of the *National Statement on Ethical Conduct in Human Research.*

Application Number: OFR # 135.16 - HREC/16/SAC/99

Title: Yoga and Mindfulness for Mental Health Research Project Phase 2: Consultation

Chief investigator: Dr Timothy Schultz

Approval Date: 18 July 2016

Approval Period: 18 July 2016 to 18 July 2020

Public health sites approved under this application: Noarlunga Hospital

The below documents have been reviewed and approved:

- General Research Application form v5 dated 04 July 2016
- Focus Group Outline v2 dated 14 April 2016
- Consumer Recruitment Email v2 dated 14 April 2016
- Advertisement Flyer v3 dated 24 May 2016
- CAG Recruitment Email v2 dated 14 April 2016
- SMH Staff Recruitment Email v2 dated 14 April 2016
- Yoga Teachers Recruitment Email v2 dated 14 April 2016
- Endorsement Letter – Andrew Champion dated 04 September 2015
- Endorsement Letter – John Mannion dated 04 September 2015
- Participant Information Sheet/Consent Form v5 dated 01 July 2016 (tracked)
- Participant Information Sheet/Consent Form v5 dated 01 July 2016 (tracked)
- Participant Information Sheet/Consent Form v5 dated 01 July 2016 (tracked)
- Yoga and Mental Health Research Protocol dated July 2016

TERMS AND CONDITIONS OF ETHICAL APPROVAL
As part of the Institution's responsibilities in monitoring research and complying with audit requirements, it is essential that researchers adhere to the conditions below and with the *National Statement chapter 5.5.*

Final ethical approval is granted subject to the researcher agreeing to meet the following terms and conditions:

1. The approval only covers the science and ethics component of the application. A SSA will need to be submitted and authorised before this research project can commence at any of the approved sites identified in the application.
2. If University personnel are involved in this project, the Principal Investigator should notify the University before commencing their research to ensure compliance with University requirements including any insurance and indemnification requirements.
3. Compliance with the *National Statement on Ethical Conduct in Human Research* (2007) & the *Australian Code for the Responsible Conduct of Research* (2007).
4. To immediately report to SAC HREC anything that may change the ethical or scientific integrity of the project.
5. Report Significant Adverse events (SAE's) as per SAE requirements available at our website.
6. Submit an annual report on each anniversary of the date of final approval and in the correct template from the SAC HREC website.
7. Confidentiality of research participants MUST be maintained at all times.
8. A copy of the signed consent form must be given to the participant unless the project is an audit.
9. Any reports or publications derived from the research should be submitted to the Committee at the completion of the project.
10. All requests for access to medical records at any SALHN site must be accompanied by this approval email.
11. To regularly review the SAC HREC website and comply with all submission requirements, as they change from time to time.
12. Once your research project has concluded, any new product/procedure/intervention cannot be conducted in the SALHN as standard practice without the approval of the SALHN New Medical Products and Standardisation Committee or the SALHN New Health Technology and Clinical Practice Innovation Committee (as applicable) Please refer to the relevant committee link on the SALHN intranet for further information.

Kind Regards

Paula Davies
Manager, Office for Research

Appendix 8. Phase 3 – Email to staff re consumer recruitment

Dear Southern Mental Health staff

This email is to introduce the **Yoga and Mental Health Pilot study: Yoga course with mental health consumers, a randomised controlled trial**, of the **Yoga and Mental Health PhD research project** being undertaken at the University of Adelaide and Southern Mental Health.

The aim of this research project is to examine the role of yoga in the development of mindfulness and self-compassion skills and relationship to mental health outcomes for stress, depression, anxiety and well-being. It is anticipated that recommendations for future health care delivery and specific strategies for the role of nursing practice will be developed from this research.

Phase 1 – Survey to SA Yoga Teachers and Students, was undertaken in 2014-2015 (Ethics approval no. 2014141).

Phase 2 - Consultation with Southern Mental Health Consumers, Southern Mental Health staff and Yoga Teachers was undertaken in 2016 (Ethics Approval no 135.16-HREC/16/SAC/99)

Phase 3 – Pilot study: Yoga course with mental health consumers, a randomised controlled trial is the next stage

You are encouraged to invite Outer South Mental Health Consumers to participate in Phase 3, which will involve random allocation to EITHER the *Yoga course* intervention group OR the *Wait list* group (who will receive the yoga course intervention in early 2018).

The **yoga course intervention group** will participate in a twice-weekly one hour yoga class, yoga journal and home practice for 10 weeks commencing in September 2017 and complete pre-test, mid-test, 10-week post-test and three-month follow up psychological and mental health self-report questionnaires.

The **waitlist group** will not receive any intervention but will be required to complete pre, mid, 10 week and three-month post intervention psychological and mental health tools. The waitlist control group will be offered the same intervention as the yoga group in early 2018.

All participants will be provided with a yoga mat, block, strap (week 3), yoga journal, handouts and certificate of completion at the end of their 10-week yoga course

Participants must be:

- Registered Outer South Mental Health Consumers who identify with experiencing anxiety and/or depression
- Able to give informed consent to participate
- Not experiencing any significant health problems (physical and/or mental), stressors of treatment regimes that may impact on, be affected or worsened by participation, as determined by their treating mental health team
- Medically cleared to participate in yoga by their GP and willing to complete a yoga medical registration form
- Nil to minimal yoga experience

-Not pregnant, due to the specific tailored program and pre-natal qualified yoga teacher required

Participation is voluntary and Consumers may choose to withdraw at any time.

If you know of any **Outer South Community Mental Health Consumers** who may be interested and suitable to participate please provide them with the attached flyer, participant information sheet and consent form and yoga registration and medical clearance forms.

Please note: The participant consent form will need to be completed and signed with the consumer by their care coordinator/community mental health team and yoga registration and medical clearance form by their GP before being considered for the yoga research project. **The research team cannot do this due to ethics requirements**

Please email ALL completed forms to Nicole at Nicole.snaith@adelaide.edu.au or contact Nicole to arrange pick up of forms from Adaire clinic

Consumers will be notified in writing of the outcome, either random allocation to the **Yoga Course group** OR **Wait list group** OR advised the yoga research project is not suitable for them at this time and alternative options.

Thank you for your support and please do not hesitate to contact me with any questions Nicole.snaith@adelaide.edu.au or phone 8384 9969

Yours Sincerely

Nicole Snaith
PhD Candidate/ Mental Health Nurse
School of Nursing
University of Adelaide
Nicole.snaith@adelaide.edu.au

Appendix 9. Phase 3 – Information flyer

THE UNIVERSITY of ADELAIDE

Outer Southern Mental Health Consumers

You are invited to join a focus group on

Yoga and Mental Health

You do not need yoga experience – all welcome!
You will not be required to do any Yoga practices

You will receive a $10 voucher for your participation

This focus group is part of a PhD Research project with the University of Adelaide exploring the role of Yoga and mindfulness in the management of stress, anxiety and depression

To register your interest please speak to your Outer South Community Mental Health Team/Care Coordinator and request an information sheet

This study has been approved by the Southern Adelaide Clinical Human Research Ethics Committee - Ethics Approval no 135.16 – HREC/16/SAC/99

Appendix 10. Phase 3 – Consumer information and consent form

THE UNIVERSITY of ADELAIDE

Participant Information Sheet (Consumer)

Interventional Study

Southern Mental Health – Noarlunga Outer South Mental Health Service

Title	Yoga and Mindfulness for Mental Health Research Project Phase 2: Consultation
Short Title	Yoga and Mental Health
Protocol Number	135.16
Project Sponsor	Nil
Coordinating Principal Investigator/ Principal Investigator	Dr Timothy Schultz
Associate Investigator(s)	Nicole Butterfield Dr Philippa Rasmussen Dr Michael Proeve
Location	Outer South Mental Health Services – GP Plus Noarlunga

Part 1 What does my participation involve?

1 Introduction

You are invited to take part in this research project. This is because you are a Mental Health consumer with Southern Mental Health. This is Phase 2 of the research, which involves participation in a focus group to discuss the development, including feasibility and acceptability of Phase 3: Pilot yoga course with Mental Health Consumers in 2017.

This Participant Information Sheet/Consent Form tells you about the research project. It explains the tests and treatments involved. Knowing what is involved will help you decide if you want to take part in the research.

Please read this information carefully. Ask questions about anything that you don't understand or want to know more about. Before deciding whether or not to take part, you might want to talk about it with a relative, friend or your local doctor.

Participation in this research is voluntary. If you don't wish to take part, you don't have to. You will receive the best possible care whether or not you take part.

If you decide you want to take part in the research project, you will be asked to sign the consent section. By signing it you are telling us that you:

- Understand what you have read
- Consent to take part in the research project
- Consent to the use of your personal and health information as described.

You will be given a copy of this Participant Information and Consent Form to keep.

2 What is the purpose of this research?

This research is a part of a PhD project being undertaken at the University of Adelaide to explore the *role of Yoga on mental health and well-being*.

The overall aim of this research project is to examine the role of yoga in the development of mindfulness and self-compassion skills and relationship to mental health outcomes for stress, depression, anxiety and well-being. Recommendations for future health care delivery and specific strategies for the role of nursing practice will be developed.

Phase 1 – Survey to SA Yoga Teachers and Students, was undertaken in 2014-2015 (University of Adelaide HREC Ethics Approval no. 2014141).

Phase 2 - Consultation with Southern Mental Health Consumers, Southern Mental Health staff and Yoga Teachers is the next phase.

The aim of the consultation and three focus groups is to discuss the feasibility, acceptability and design of the Pilot Yoga Course to be undertaken with Mental Health Consumers in 2017. Findings of the consultation process, along with results of Phase 1 and current yoga research and protocols will be used to develop Phase 3 - the Pilot Yoga Course with Mental Health Consumers.

The results of this research will be used by the researcher *Nicole Butterfield* to obtain a *Doctor of Philosophy* degree. This research is being conducted by the University of Adelaide

3 What does participation in this research involve?

This is Phase 2 of the research, which involves participation in a one hour focus group

Participation involves the following:

1. Pre-screening

   If you decide to take part in the research project, you will first undertake a phone screening questionnaire about your mental health background; this will determine if you are eligible to take part. Your community mental health team will need to be involved in this screening or consulted after the screening, with your permission, to further assess your current functioning and eligibility. Completing the screening questionnaire will take approximately 5-10 minutes.

   If the screening questionnaire and consultation with your community mental health team shows that you meet the requirements, then you will be able to start the research project. If the screening questionnaire shows that you cannot be in the research project, the research coordinator will discuss other options with you.

2. Your signed consent (or verbal if your community mental health team are present during the phone interview) regarding researcher liaison with your community mental health team to discuss your eligibility to participate.

3. If eligible and willing to proceed, you will be required to read/have someone read out and explain the participant information sheet and if still willing to proceed and agree you understand, sign the attached consent form to participate in the focus groups.

4. You will then receive a letter of offer to participate in a one hour focus group during business hours at GP Plus Noarlunga in June-July 2017.

5. Your commitment is to participate and engage in conversation regarding your yoga experience (if relevant) and your thoughts and ideas about the feasibility, acceptability and issues to consider for Phase 3: Pilot yoga course with Southern Mental Health

consumers, the next stage of this research to be undertaken in 2017, during this one hour focus group.

6. Participants will be provided with refreshments during and a $10 gift voucher at the completion of the focus group.

7. Your commitment is limited to this one hour focus group and there will not be any follow up as part of this phase of the research

8. The focus group conversation will be recorded by audio recording device

9. The focus group will take place at GP Plus Noarlunga and there will be no participant choice regarding location.

This research project has been designed to make sure the researchers interpret the results in a fair and appropriate way and avoids researchers or participants jumping to conclusions.
There are no additional costs associated with participating in this research project, nor will you be paid. All interventions required as part of the research project will be provided to you free of charge. You will be reimbursed with a $10 gift voucher for any reasonable expenses associated with the research project visit.

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4 What do I have to do?

Your commitment is to participate in a one hour focus group, which will entail engaging in conversation regarding your yoga experience (if relevant) and your thoughts and ideas about the feasibility, acceptability and issues to consider for Phase 3: Pilot yoga course with Southern mental health consumers, the next stage of this research to be undertaken in 2017, during this one hour focus group.

The inclusion and exclusion criteria must be met to participate in the study and you must provide permission for the research team to liaise with your community mental health team.

There are no other requirements or restrictions to fully participate in the study.

5 Other relevant information about the research project

This project involves three separate focus groups including:

1. Southern Mental Health Consumers
2. Southern Mental Health staff
3. SA Yoga Teachers.

Each focus group will have up to 15 participants and one to two sessions, with a total of up to 80 participants across the three focus groups.

This research involves Southern Mental Health and the University of Adelaide.

This is Phase 2 of the research project. Phase 1: Survey to SA Yoga teachers and students was undertaken in 2014. Phase 1 and 2 findings will be used along with existing research protocols will be used to develop Phase 3: Pilot Yoga course with Southern Mental Health Consumers to be undertaken in 2017.

6 Do I have to take part in this research project?

Participation in any research project is voluntary. If you do not wish to take part, you do not have to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage.

If you do decide to take part, you will be given this Participant Information and Consent Form to sign and you will be given a copy to keep.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your routine treatment, your relationship with those treating you or your relationship with SA Health or the University of Adelaide.

7 What are the alternatives to participation?

You do not have to take part in this research project to receive treatment at this hospital/health service. This is an optional focus group that you may participate in, in addition and unrelated to your current treatment.

8 What are the possible benefits of taking part?

We cannot guarantee or promise that you will receive any benefits from this research; however, possible benefits may include:

1. Contributing to developing a research project that may help people with anxiety and depression
2. Potential sense of achievement and satisfaction from being involved in the consultation
3. Learn about strategies to improve symptoms of anxiety and depression
4. Opportunity to meet with other Mental Health Consumers

9 What are the possible risks and disadvantages of taking part?

Psychological distress
You may feel that some of the questions we ask are stressful or upsetting. If you do not wish to answer a question, you may skip it and go to the next question, or you may stop immediately. If you become upset or distressed as a result of your participation in the research project, the research team will be able to arrange for counselling or other appropriate support.

Whilst all care will be taken to maintain privacy and confidentiality, you may experience embarrassment if one of the group members were to repeat things said in a confidential group meeting.

11 What if new information arises during this research project?

Sometimes during the course of a research project, new information becomes available about the intervention that is being studied. If this happens, the research team will tell you about it and discuss with you whether you want to continue in the research project. If you decide to continue in the research project you will be asked to sign an updated consent form.

Also, on receiving new information, the research team might consider it to be in your best interests to withdraw you from the research project. If this happens, he/she will explain the reasons and arrange for your regular health care to continue.

12 Can I have other treatments during this research project?

Participation in this research project, which involves a one hour focus group, will not have any impact on medications or treatments you have been taking for your condition or for other reasons. You may continue with your usual treatment while participating in the research project.

13 What if I withdraw from this research project?

If you do consent to participate, you may withdraw at any time. If you decide to withdraw from the project, please notify a member of the research team before you withdraw. A member of the research team will inform you if there are any special requirements linked to withdrawing. If you do withdraw, you will be asked to complete and sign a 'Withdrawal of Consent' form; this will be provided to you by the research team.

If you decide to leave the research project, the researchers will not collect additional personal information from you, although personal information already collected will be retained to ensure that the results of the research project can be measured properly and to comply with law. You should be aware that data collected up to the time you withdraw will form part of the research project results. If you do not want your data to be included, you must tell the researchers before you join the research project.

14 Could this research project be stopped unexpectedly?

This research project may be stopped unexpectedly for a variety of reasons. These may include reasons such as: as resource availability or change in direction of research.

15 What happens when the research project ends?

Participants can register their interest to be provided with a summary of the results of the focus groups, which will be available by email or hard-copy in 2017.

Part 2 How is the research project being conducted?

16 What will happen to information about me?

By signing the consent form you consent to the research team collecting and using personal information about you for the research project. Any information obtained in connection with this research project that can identify you will remain confidential. Any potential identifying data will not be used in the reporting of this research; only aggregate results will be analysed and presented. The data is confidential and only the research team will have access. On completion of the research we will remove these details from the data that will be stored securely for five years. Your information will only be used for the purpose of this research project and it will only be disclosed with your permission, except as required by law.

Information about you may be obtained from your health records held at this and other health services for the purpose of this research. By signing the consent form you agree to the study team accessing health records if they are relevant to your participation in this research project.

Your health records and any information obtained during the research project are subject to inspection (for the purpose of verifying the procedures and the data) by the institution relevant to this Participant Information Sheet, SA Health and the University of Adelaide, or as required by law. By signing the Consent Form, you authorise release of, or access to, this confidential information to the relevant study personnel and regulatory authorities as noted above.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified, except with your permission. Confidentiality will be maintained by no mention of your specific name or personal details but use of aggregate results from the focus groups.

Information about your participation in this research project may be recorded in your health records.

In accordance with relevant Australian and/ or South Australian privacy and other relevant laws, you have the right to request access to your information collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. Please contact the research team member named at the end of this document if you would like to access your information.

Any information obtained for the purpose of this research project *and for the future research described in Section 16* that can identify you will be treated as confidential and securely stored. It will be disclosed only with your permission, or as required by law.

17 Complaints and compensation

If you suffer any injuries or complications as a result of this research project, you should contact the research team as soon as possible and you will be assisted with arranging appropriate medical treatment. If you are eligible for Medicare, you can receive any medical treatment required to treat the injury or complication, free of charge, as a public patient in any Australian public hospital.

18 Who is organising and funding the research?

This research project is being conducted by Nicole Butterfield of the University of Adelaide.

SA Health and/or the University of Adelaide may benefit financially from this research project if, for example, the project assists the SA Health and/or the University of Adelaide to obtain approval for a new procedure.

You will not benefit financially from your involvement in this research project even if, for example, your samples (or knowledge acquired from analysis of your samples) prove to be of commercial value to SA Health and/or the University of Adelaide.

In addition, if knowledge acquired through this research leads to discoveries that are of commercial value to SA Health and/or the University of Adelaide, the researchers or their institutions, there will be no financial benefit to you or your family from these discoveries.

No member of the research team will receive a personal financial benefit from your involvement in this research project (other than their ordinary wages).

19 Who has reviewed the research project?

All research in Australia involving humans is reviewed by an independent group of people called a Human Research Ethics Committee (HREC). The ethical aspects of this research project have been approved by the Southern Adelaide Clinical Human Research Ethics Committee and the University of Adelaide Human Research Ethics Committee. This project will be carried out according to the *National Statement on Ethical Conduct in Human Research (2007)*. This statement has been developed to protect the interests of people who agree to participate in human research studies.

20 Further information and who to contact

The person you may need to contact will depend on the nature of your query.

If you want any further information concerning this project or if you have any medical problems which may be related to your involvement in the project (for example, any side effects), you can contact the principal researcher on 8313 6270 or any of the following people:

Clinical contact person/Principal Researcher

Name	Dr Timothy Schultz
Position	Research Fellow
Telephone	8313 6270
Email	Tim.schultz@adelaide.edu.au

For matters relating to research at the site at which you are participating, the details of the local site complaints person are:

Complaints contact person

Name	Paula Davies
Position	Manager, Office for Research
Telephone	
Email	Health:SALHofficeforresrach@sa.gov.au

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about being a research participant in general, then you may contact:

Reviewing HREC approving this research and HREC Executive Officer details

Reviewing HREC name	Southern Adelaide Clinical
HREC Executive Officer	Damian Creaser
Telephone	
Email	Health:SALHNofficeforresearch@sa.gov.au

Local HREC Office contact (Single Site – Research Governance Officer)

Name	Dawn Jennifer
Position	Research Governance Officer
Telephone	
Email	Health:SALHNofficeforresearch@sa.gov.au

Consent Form - *Adult providing own consent*

Title	Yoga and Mindfulness for Anxiety and Depression Phase 2: Consultation
Short Title	Yoga and Mental Health
Protocol Number	135.16
Project Sponsor	N/A
Coordinating Principal Investigator/ Principal Investigator	Dr Tim Schultz
Associate Investigator(s)	Nicole Butterfield Dr Philippa Rasmussen Dr Michael Proeve
Location	Outer South Mental Health Services – Noarlunga GP Plus

Declaration by Participant

I have read the Participant Information Sheet or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research described in the project.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time during the study without affecting my future health care.

I understand that I will be given a signed copy of this document to keep.

Name of Participant (please print) _____

Signature _____ Date _____

Name of Witness* to Participant's Signature (please print) _____

Signature _____ Date _____

* Witness is not to be the investigator, a member of the study team or their delegate. In the event that an interpreter is used, the interpreter may not act as a witness to the consent process. Witness must be 18 years or older.

Declaration by Study Doctor/Senior Researcher†

I have given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Name of Study Doctor/ Senior Researcher† (please print) _____

Signature _____ Date _____

† A senior member of the research team must provide the explanation of, and information concerning, the research project.

Note: All parties signing the consent section must date their own signature.

I understand that, if I decide to discontinue the study treatment, I may be asked to attend follow-up visits to allow collection of information regarding my health status. Alternatively, a member of the research team may request my permission to obtain access to my medical records for collection of follow-up information for the purposes of research and analysis.

Name of Participant (please print) _____

Signature _____ Date _____

Name of Witness* to
Participant's Signature (please print) _____

Signature _____ Date _____

* Witness is not to be the investigator, a member of the study team or their delegate. In the event that an interpreter is used, the interpreter may not act as a witness to the consent process. Witness must be 18 years or older.

Name of Study Doctor/
Senior Researcher† (please print) _____

Signature _____ Date _____

† A senior member of the research team must provide the explanation of and information concerning the research project.

Note: All parties signing the consent section must date their own signature.

Form for Withdrawal of Participation - *Adult providing own consent*

Title	Yoga and Mindfulness for Mental Health Research Project Phase 2: Consultation
Short Title	Yoga and Mental Health
Protocol Number	135.16
Project Sponsor	Nil
Coordinating Principal Investigator/ Principal Investigator	Dr Timothy Schultz
Associate Investigator(s)	Nicole Butterfield Dr Philippa Rasmussen Dr Michael Proeve
Location	Outer South Mental Health Services – GP Plus Noarlunga

Declaration by Participant

I wish to withdraw from participation in the above research project and understand that such withdrawal will not affect my routine treatment, my relationship with those treating me or my relationship with SA Health or the University of Adelaide.

Name of Participant (please print) _____

Signature _____ Date _____

Name of Witness* to Participant's Signature (please print) _____

Signature _____ Date _____

* Witness is not to be the investigator, a member of the study team or their delegate. In the event that an interpreter is used, the interpreter may not act as a witness to the consent process. Witness must be 18 years or older.

Declaration by Study Doctor/Senior Researcher†

I have given a verbal explanation of the implications of withdrawal from the research project and I believe that the participant has understood that explanation.

Name of Study Doctor/ Senior Researcher† (please print) _____

Signature _____ Date _____

† A senior member of the research team must provide the explanation of and information concerning withdrawal from the research project.

Note: All parties signing the consent section must date their own signature.

Appendix 11. Phase 3 – Email to staff re focus group

Dear Southern Mental Health staff

This email is to introduce the **Yoga and Mental Health PhD research project** being undertaken at the University of Adelaide and Southern Mental Health and invite you to participate in phase 2 – the consultation.

The aim of this research project is to examine the role of yoga in the development of mindfulness and self-compassion skills and relationship to mental health outcomes for stress, depression, anxiety and well-being. Recommendations for future health care delivery and specific strategies for the role of nursing practice will be developed.

Phase 1 – Survey to SA Yoga Teachers and Students, was undertaken in 2014-2015.

Phase 2 - Consultation with Southern Mental Health Consumers, Southern Mental Health staff and Yoga Teachers is the next phase (Ethics Approval no. 135.16 HREC/16/SAC/99)

You are invited to participate in phase 2 a one hour duration focus group with other Southern Mental Health Professionals.

Refreshments will be provided at the focus group.

The focus group will discuss the feasibility, acceptability and design of the Pilot Yoga Course to be undertaken with Southern Mental Health Consumers in 2016. Findings of the consultation process, along with results of Phase 1 and current yoga research and protocols will be used to develop Phase 3 - Pilot Yoga Course.

Participation is voluntary and you may choose to withdraw at any time.

If you are interested in participating in the **Southern Mental Health staff** focus group please email Nicole Butterfield at **Nicole.butterfield@adelaide.edu.au** or phone

Yours Sincerely

Nicole Butterfield
PhD Candidate/ Mental Health Nurse
School of Nursing
University of Adelaide

Appendix 12. Phase 3 – Email to yoga teachers re interviews

Dear Yoga Teacher

Thank you for registering your interest in being involved the in next phase of the **Yoga and Mental Health PhD research** project being undertaken at the University of Adelaide and Southern Mental Health.

The aim of this research project is to examine the role of yoga in the development of mindfulness and self-compassion skills and relationship to mental health outcomes for stress, depression, anxiety and well-being. Recommendations for future health care delivery and specific strategies for the role of nursing practice will be developed.

Phase 1 – Survey to SA Yoga Teachers and Students, was undertaken in 2014-2015 (Ethics approval no. 2014141 – University of Adelaide Human Research Ethics Committee).

Phase 2 - Consultation with Southern Mental Health Consumers, Southern Mental Health staff and Yoga Teachers is the next phase.

You are invited to participate in phase 2, which will involve a one hour focus group and some email communication with other Yoga Teachers.

Refreshments will be provided at the focus group.

The focus group will discuss the feasibility, acceptability and design of the Pilot Yoga Course to be undertaken with Mental Health Consumers in 2017. Findings of the consultation process, along with results of Phase 1 and current yoga research and protocols will be used to develop Phase 3 - Pilot Yoga Course.

Participation is voluntary and you may choose to withdraw at any time.

If you are interested in participating in the focus group or finding our further information please email Nicole at **Nicole.butterfield@adelaide.edu.au** or phone

This study has been reviewed by the Southern Adelaide Clinical Human Research Ethics Committee.

Yours Sincerely

Nicole Butterfield
PhD Candidate/ Mental Health Nurse
School of Nursing
University of Adelaide
Nicole.butterfield@adelaide.edu.au

ATTACH 8: YOGA teachers recruitment email – VERSION 2 – 14/04/2016

Appendix 13. Phase 4 – Yoga course outline

Yoga course design

WEEK 1

Introduction (10min)

-Names

-Orientation to room set up and facilities

–Introduction to class philosophy, safety & yoga norms

Meditation & breath-work (10min)

Warm up (10 min)

Sun salutations (10min)

Floor postures (10min)

Shavasana (10min)

WEEK 2

Introduction (5min)

Meditation & breath-work (10min)

Warm up (10 min)

Sun salutations (10-15min)

Floor postures (10min)

Shavasana (10min)

WEEK 3-4

Introduction (5min)

Meditation & breath-work (10min)

Warm up (10 min)

Sun salutations (10-15min)

Standing/balance (5min)

Floor postures (10min)

Shavasana (10min)

WEEK 5

Introduction (5min)

Meditation & breath-work (10min)

Warm up (10 min)

Sun salutations (15min)

Standing/balance (5min)

Floor postures (10min)

Shavasana (10min)

FFMQ, SCS, DASS21, MHC-SF & K10+ (de-identified by use of a unique code for each participant) to be completed at the week 5 yoga class and placed in a box provided. If support is required to complete participants will be directed to their care coordinator.

WEEK 6-9

Introduction (5min)

Meditation & breath-work (10min)

Warm up (5-10 min)

Sun salutations (15-20min)

Standing/balance (5min)

Floor postures (10min)

Shavasana (10min)

WEEK 10 – (90min session)

Introduction (5min)

Meditation & breath-work (10min)

Warm up (5 min)

Sun salutations (20 min)

Standing/balance (5-10 min)

Floor postures (10min)

Shavasana (10min)

FFMQ, SCS, DASS21, MHC-SF & K10 (de-identified by use of a unique code for each participant) to be completed on the final week of the course and placed in a box provided

Feedback/evaluation forms to be completed

Graduation & certificates

WEEK 11-12

Post yoga interviews and/or focus groups

Appendix 14. Phase 4 – Ethics approval

Office for Research

Flinders Medical Centre
Ward 6C, Room 6A219
Flinders Drive, Bedford Park SA 5042
Tel: (08) 8204 6453
E: Health.SALHNOfficeforResearch@sa.gov.au

Government of South Australia
SA Health
Southern Adelaide Local Health Network

Final Approval for Governance SSA Application

14 August 2017

Dr Tim Schultz,
Research Fellow School of Nursing.
The University of Adelaide

Dear Dr Tim Schultz,

OFR Number:	38.17
HREC reference number:	HREC/17/SAC/66
SSA reference number:	SSA/17/SAC/148
Project title:	Yoga and mental health pilot study: the effectiveness of a 10-week yoga course on outcomes in a consumer group: a randomised controlled trial
Chief Investigator:	Dr Tim Schultz,
Site(s):	Noarlunga Health Service

Ethics Approval Period: 18 May 2017 to 18 May 2020

On the basis of the information provided in your Site Specific Assessment submission, I am pleased to inform you the SALHN Chief Executive Officer has granted approval for this study to commence at the above nominated site(s).

You are reminded that this letter constitutes **Governance** approval only. **Governance approval is one aspect of the research governance process.**

You must not undertake the research project at any SA Health sites listed in the application without a valid Ethics Approval, or an Access Request for data or tissue form has been approved, by an appropriately registered and certified Human Research Ethics Committee (HREC).

The below documents have been reviewed and approved:

- SSA Document dated 12/07/2017
- SAC HREC Ethics Approval Letter dated 05/06/2017
- CV Tim Schultz
- Research Protocol Yoga & Mental Health v3 dated 05/07/2017
- PICF v4 dated 05/07/2017

HREC reviewed documents listed on the approval letter are accepted as part of the site authorisation.

The SSA reference number should be quoted in any correspondence about this matter.

If University personnel are involved in this project, the Principal Investigator should notify the University before commencing their research to ensure compliance with University requirements including any insurance and indemnification requirements.

TERMS AND CONDITIONS OF ETHICS AND GOVERNANCE APPROVAL
As part of the Institution's responsibilities in monitoring research and complying with audit requirements, it is essential that researchers adhere to the conditions below and with the *National Statement chapter 5.5.*

- If University personnel are involved in this project, the Principal Investigator should notify the University before commencing their research to ensure compliance with University requirements including any insurance and indemnification requirements.
- Compliance with the National Statement on Ethical Conduct in Human Research (2007) & the Australian Code for the Responsible Conduct of Research (2007).
- To immediately report to the Office for Research anything that may change the ethics or scientific integrity of the project.
- Report Significant Adverse events (SAEs) as per SAE requirements available on the Office for Research website.
- Submit an annual report on each anniversary of the date of final approval and in the correct template from the Office for Research website.
- Confidentiality of research participants MUST be maintained at all times.
- A copy of the signed consent form must be given to the participant.
- Any reports or publications derived from the research should be submitted to the Committee at the completion of the project.
- All requests for access to medical records at any SALHN site must be accompanied by this approval letter.
- Once your research project has concluded, any new product/procedure/intervention cannot be conducted in the SALHN as standard practice without the approval of the SALHN New Medical Products and Standardisation Committee or the SALHN New Health Technology and Clinical Practice Innovation Committee (as applicable). Please refer to the relevant committee link on the SALHN intranet for further information.
- Researchers are reminded that all advertisements/flyers need to be approved by the committee, and that no promotion of a study can commence until final ethics and executive approval has been obtained. In addition, all media contact should be coordinated through the FMC media unit.

Should you have any queries about the consideration of your Site Specific Assessment form, please contact the Office for Research on 8204 6453 via email: Health.SALHNOfficeforResearch@sa.gov.au.

Yours sincerely

Simon Windsor
Research Governance Officer
Office for Research

Appendix 15. Five-facet Mindfulness Questionnaire

Five Facet Mindfulness Questionnaire

Description:

This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. More information is available in:

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes your own opinion of what is generally true for you.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.
_____ 2. I'm good at finding words to describe my feelings.
_____ 3. I criticize myself for having irrational or inappropriate emotions.
_____ 4. I perceive my feelings and emotions without having to react to them.
_____ 5. When I do things, my mind wanders off and I'm easily distracted.
_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
_____ 7. I can easily put my beliefs, opinions, and expectations into words.
_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
_____ 9. I watch my feelings without getting lost in them.
_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.
_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
_____ 12. It's hard for me to find the words to describe what I'm thinking.
_____ 13. I am easily distracted.
_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.

_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
_____ 16. I have trouble thinking of the right words to express how I feel about things
_____ 17. I make judgments about whether my thoughts are good or bad.
_____ 18. I find it difficult to stay focused on what's happening in the present.
_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
_____ 21. In difficult situations, I can pause without immediately reacting.
_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.
_____ 24. When I have distressing thoughts or images, I feel calm soon after.
_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.
_____ 26. I notice the smells and aromas of things.
_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.
_____ 28. I rush through activities without being really attentive to them.
_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
_____ 32. My natural tendency is to put my experiences into words.
_____ 33. When I have distressing thoughts or images, I just notice them and let them go.
_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.
_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
_____ 36. I pay attention to how my emotions affect my thoughts and behavior.
_____ 37. I can usually describe how I feel at the moment in considerable detail.
_____ 38. I find myself doing things without paying attention.
_____ 39. I disapprove of myself when I have irrational ideas.

Appendix 16. Self-compassion Scale

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never				Almost always
1	2	3	4	5

_____ 1. I'm disapproving and judgmental about my own flaws and inadequacies.

_____ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.

_____ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.

_____ 5. I try to be loving towards myself when I'm feeling emotional pain.

_____ 6. When I fail at something important to me I become consumed by feelings of inadequacy.

_____ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.

_____ 8. When times are really difficult, I tend to be tough on myself.

_____ 9. When something upsets me I try to keep my emotions in balance.

_____ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.

_____ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

_____ 14. When something painful happens I try to take a balanced view of the situation.

_____ 15. I try to see my failings as part of the human condition.

_____ 16. When I see aspects of myself that I don't like, I get down on myself.

_____ 17. When I fail at something important to me I try to keep things in perspective.

_____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.

_____ 19. I'm kind to myself when I'm experiencing suffering.

_____ 20. When something upsets me I get carried away with my feelings.

_____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.

_____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.

_____ 23. I'm tolerant of my own flaws and inadequacies.

_____ 24. When something painful happens I tend to blow the incident out of proportion.

_____ 25. When I fail at something that's important to me, I tend to feel alone in my failure.

_____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

Appendix 17. Depression, Anxiety and Stress Scale

DASS

Name: *Date:*

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found myself getting upset by quite trivial things	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I just couldn't seem to get going	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I had a feeling of shakiness (eg, legs going to give way)	0	1	2	3
8	I found it difficult to relax	0	1	2	3
9	I found myself in situations that made me so anxious I was most relieved when they ended	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting upset rather easily	0	1	2	3
12	I felt that I was using a lot of nervous energy	0	1	2	3
13	I felt sad and depressed	0	1	2	3
14	I found myself getting impatient when I was delayed in any way (eg, lifts, traffic lights, being kept waiting)	0	1	2	3
15	I had a feeling of faintness	0	1	2	3
16	I felt that I had lost interest in just about everything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life wasn't worthwhile	0	1	2	3

Please turn the page ☞

Reminder of rating scale:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

22	I found it hard to wind down	0	1	2	3
23	I had difficulty in swallowing	0	1	2	3
24	I couldn't seem to get any enjoyment out of the things I did	0	1	2	3
25	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
26	I felt down-hearted and blue	0	1	2	3
27	I found that I was very irritable	0	1	2	3
28	I felt I was close to panic	0	1	2	3
29	I found it hard to calm down after something upset me	0	1	2	3
30	I feared that I would be "thrown" by some trivial but unfamiliar task	0	1	2	3
31	I was unable to become enthusiastic about anything	0	1	2	3
32	I found it difficult to tolerate interruptions to what I was doing	0	1	2	3
33	I was in a state of nervous tension	0	1	2	3
34	I felt I was pretty worthless	0	1	2	3
35	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
36	I felt terrified	0	1	2	3
37	I could see nothing in the future to be hopeful about	0	1	2	3
38	I felt that life was meaningless	0	1	2	3
39	I found myself getting agitated	0	1	2	3
40	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
41	I experienced trembling (eg, in the hands)	0	1	2	3
42	I found it difficult to work up the initiative to do things	0	1	2	3

Appendix 18. Mental Health Continuum

Adult MHC-SF (ages 18 or older)

Please answer the following questions are about how you have been feeling during the past month. Place a check mark in the box that best represents how often you have experienced or felt the following:

During the past month, how often did you feel …	NEVER	ONCE OR TWICE	ABOUT ONCE A WEEK	ABOUT 2 OR 3 TIMES A WEEK	ALMOST EVERY DAY	EVERY DAY
1. happy						
2. interested in life						
3. satisfied with life						
4. that you had something important to contribute to society						
5. that you belonged to a community (like a social group, or your neighborhood)						
SEE BELOW 6. that our society is a good place, or is becoming a better place, for all people						
7. that people are basically good						
8. that the way our society works makes sense to you						
9. that you liked most parts of your personality						
10. good at managing the responsibilities of your daily life						
11. that you had warm and trusting relationships with others						
12. that you had experiences that challenged you to grow and become a better person						
13. confident to think or express your own ideas and opinions						
14. that your life has a sense of direction or meaning to it						

Note: The original wording for item 6 was "that our society is becoming a better place for people like you." This item does not work in all cultural contexts. However, when validating the MHC-SF, test both versions of item 6 to see which one works best in your context.

Appendix 19. Kessler 10 Psychological Distress Scale

We're listening to you.

We value the information from you about how you are feeling and how you are coping with everyday activities.

You can help by filling in the simple questionnaire that is attached.

There are no right or wrong answers, just choose the response that best shows how you feel.

Helping us with these questions is optional and please be assured that if you choose not to complete this questionnaire, it will in no way prejudice the relationship with your treatment team.

The information will be kept confidential and only used to look at how you are feeling and to help us plan better health services.

Insert health unit logo here	NOCC Assessment Consumer Self-Report Measure **K10+**	Unit Record No: _____ CME Number: _____

Instructions for the consumer.

The following ten questions ask about how you have been feeling in the last four weeks. For each question, mark the circle under the option that best describes the amount of time you felt that way.

		None of the time	A little of the time	Some of the time	Most of the time	All of the time
1.	In the last four weeks, about how often did you feel tired out for no good reason?	O	O	O	O	O
2.	In the last four weeks, about how often did you feel nervous?	O	O	O	O	O
3.	In the last four weeks, about how often did you feel so nervous that nothing could calm you down?	O	O	O	O	O
4.	In the last four weeks, about how often did you feel hopeless?	O	O	O	O	O
5.	In the last four weeks, about how often did you feel restless or fidgety?	O	O	O	O	O
6.	In the last four weeks, about how often did you feel so restless you could not sit still?	O	O	O	O	O
7.	In the last four weeks, about how often did you feel depressed?	O	O	O	O	O
8.	In the last four weeks, about how often did you feel that everything was an effort?	O	O	O	O	O
9.	IN the last four weeks, about how often did you feel so sad that nothing could cheer you up?	O	O	O	O	O
10.	In the last four weeks, about how often did you feel worthless?	O	O	O	O	O

The next few questions are about how these feelings may have affected you in the **last four weeks**.

You need not answer these questions if you answered "None of the time" to all of the ten questions about your feelings.

11.	In the last four weeks, how many days were you TOTALLY UNABLE to work, study or manage your day to day activities because of these feelings?	_____ (Number of Days)
12.	Aside from those days, in the last 4 weeks, HOW MANY DAYS were you able to work or study of manage your day to day activities, but had to CUT DOWN on what you did because of these feelings?	_____ (Number of Days)
13.	In the last 4 weeks, how many times have you seen a doctor or any other health professional about these feelings?	_____ (Number of Days)

		None of the time	A little of the time	Some of the time	Most of the time	All of the time
14..	In the last 4 weeks, how often have physical health problems been the main cause of these feelings?	O	O	O	O	O

Thank-you for completing this questionnaire.
Please return it to the staff member who asked you to complete it.

Appendix 20. Phase 4 – Information flyer

THE UNIVERSITY of ADELAIDE

Southern Mental Health Consumers

You are invited to join a free 10-week

Yoga Course

for people with anxiety and depression

You do not need any yoga experience!

This pilot yoga course is part of a PhD Research project with the University of Adelaide exploring the role of Yoga and mindfulness in the management of stress, anxiety and depression

To register your interest please contact your Care Coordinator, Rehab Coordinator or Nicole via TPC on Ph: 8384 9969

This study has been approved by the Southern Adelaide Local Health Network Human Research Ethics Committee - Ethics Approval no. 38.17-HREC/17/SAC/66-SSA/17/SAC/148

Appendix 21. Phase 4 – Yoga registration and medical form

Yoga Registration & Medical Form

Name: Date:

Phone/mobile: Postcode:

Address:

Email:

GP: Phone:

Emergency contact: Phone:

1. Yoga practice

Yes/No Have you practiced yoga before? *If yes, please provide details*

What do you want to achieve from practicing yoga?

What fitness/exercise are you currently doing?

2. Participant Health Questionnaire:

Have you ever experienced any of the following? *Please circle and provide details*

Yes/No High or low blood pressure

Yes/No Black outs/dizziness/fainting

Yes/No Diabetes

Yes/No Asthma

Yes/No Epilepsy/seizures/convulsions

Yes/No Anxiety/nervous condition

Yes/No Depression

Yes/No Heart attack/ stroke/angina

Yes/No Ulcer/hernia

Yes/No Recent fractures/sprains/injuries

Yes/No Back pain/problems

Yes/No Knee problems

Yes/No Shoulder problems

Yes/No Chronic pain

Yes/No Bone/joint conditions/osteoarthritis/arthritis?

Yes/No Have you had recent surgery?

Yes/No Are you pregnant or is there any possibility you may be pregnant?

Yes/No Do you have any Allergies?

Any other special medical/physical considerations

Current medications (Please list all your medications and purpose)

MEDICAL CLEARANCE

We require medical clearance from your GP to allow you to participate in Phase 3: Pilot Yoga course, of the Yoga Research Project

I, Dr……am not aware of any contraindications towards ……..(participant's name) participation in yoga practice and provide medical clearance for them to participate in Phase 3: Pilot yoga course, of the yoga research project

_____

GP signature & printed name Date

PARTICIPANT CONSENT:

I have been informed, understand and I am aware that strength and flexibility exercises, including yoga are potentially hazardous activities. I have also been informed, understand and I am aware that these activities involve a risk of injury and that I am voluntarily participating in these activities with full knowledge, understanding and appreciation of the dangers involved.

_____

Signature & printed name of participant Date

_____

Staff signature & printed name Date

Appendix 22. Phase 4 – Participant sheet and consent form

Government of South Australia
SA Health

Flinders UNIVERSITY

THE UNIVERSITY of ADELAIDE

Participant Information Sheet

Interventional Study - *Adult providing own consent*

Southern Mental Health – Noarlunga Outer South Mental Health Service

Title	Yoga and mental health pilot study: the effectiveness of a 10-week yoga course on outcomes in a consumer group: a randomised controlled trial
Short Title	Yoga and mental health pilot study
Protocol Number	
Project Sponsor	Nil
Coordinating Principal Investigator/ Principal Investigator	Dr Timothy Schultz Nicole Snaith Leanne Rootsey (Co-Principle Investigator)
Associate Investigator(s)	Dr Philippa Rasmussen Dr Michael Proeve
Location	SALHN Recovery College, Noarlunga Centre

Part 1 What does my participation involve?

1 Introduction

You are invited to take part in this research project as a consumer with Southern Mental Health who identifies with experiencing anxiety and/or depression.

The research involves participation in a 10-week yoga course or wait list group (who will be acting as a control group and will be offered the yoga course intervention in late 2018 or early 2019), which will be randomly allocated.

This Participant Information Sheet tells you about the research project and explains the treatments and tests involved. Knowing what is involved will help you decide if you want to take part in the research.

Please read this information carefully. Ask questions about anything that you don't understand or want to know more about. Before deciding whether or not to take part, you might want to talk about it with your mental health team, a relative, friend or your local doctor.

Participation in this research is voluntary. If you don't wish to take part, you don't have to. You will receive the best possible care whether or not you take part.

If you decide you want to take part in the research project, you will be asked to sign the consent section. By signing it you are telling us that you:

• Understand what you have read
• Consent to take part in the research project
• Consent to have the interventions that are described
• Consent to the use of your personal and health information as described.

You will be given a copy of this Participant Information and Consent Form to keep.

2 What is the purpose of this research?

This research is a part of a PhD project being undertaken at the University of Adelaide to explore the *Role of yoga on mental health and well-being*.

The overall aim of this research project is to examine the role of yoga in the development of mindfulness and self-compassion skills and relationship to mental health outcomes for stress, depression, anxiety and well-being. It is anticipated that recommendations for future health care delivery and specific strategies for the role of nursing practice will be developed from this research.

The aim of the research project is to examine the effect of regular yoga practice on mental health outcomes (stress, anxiety, depression, wellbeing), as well as self-reporting of these measures (through yoga practice journals and feedback/evaluation forms) and psychological measures (mindfulness and self-compassion) for consumers of Southern Adelaide Mental Health Services.

3 What does participation in this research involve?

Participation involves the following:

You will be participating in a randomised controlled research project. Sometimes we do not know which treatment is best for treating a condition. To find out we need to compare different treatments. We put people into groups and give each group a different treatment. The results are compared to see if one is better. To try to make sure the groups are the same, each participant is put into a group by chance (random). There is a 50% chance that you will be allocated to the intervention group (yoga course group) and 50% chance you will be allocated to the waitlist group (who will receive the same intervention in late 2018 or early 2019).

1. Pre-screening

   If you register your interest in taking part in the research project via your care coordinator/community mental health team, your care coordinator/mental health team will be consulted, with your permission, to determine your eligibility to participate, as per the inclusion and exclusion criteria.

   If you contacted the research team directly your care coordinator/mental health team will still need to be consulted, with your permission, to determine your eligibility to participate first, as per the inclusion and exclusion criteria.

   You will also need to complete a yoga registration and medical form including signed medical clearance from your GP prior to commencing the course

   If you cannot be involved in the research project at this time, your care coordinator will discuss other options with you.

2. You will be required to read and sign the participant information and consent form to participate in the pilot yoga course, which your care coordinator/treating mental health team will go through with you in March/April 2018, prior to the course commencing.

3. You will then be randomly allocated to either the yoga course intervention group or waitlist group (you will be offered the same yoga intervention in late 2018 or early 2019).

4. You receive a letter of offer to participate in the 10-week pilot yoga course commencing in May 2018 or waitlist group (you will offered the same intervention in late 2018 or early 2019) or advising that you have not been successful at this time and alternative options.

5. **Yoga group**: Your commitment is to participate in the twice weekly yoga course, yoga journal and home practice for 10 weeks to the best of your ability.

   You will also be required to complete pre, mid and post yoga course psychological and mental health measures including at three month follow up, an evaluation/feedback form at the final session in week 10 and participate in an interview or focus group after the 10-week yoga course.

6. **Waitlist group:** You will not receive any intervention over the 10-weeks but you will be required to complete pre, mid and after the yoga course psychological and mental health outcome measures, including at week 10 and three month follow up.

   You will be offered the same yoga course intervention after completion of the first yoga course, in late 2018 or early 2019.

7. Participants of both the yoga course and waitlist groups will be required to complete the Five Facet Mindfulness Questionnaire (FFMQ), Self-compassion scale (SCS), Depression, Anxiety and Stress Scale 21 (DASS21), Mental Health Continuum Short-form (MHC-SF) and K10+ tools prior, during (week 4-5) and after the yoga course at week 10 and three month follow up, taking 15-20 minutes to complete each time.

   The three month follow up tools will be posted to you to complete with a pre-paid postage envelope to return the forms.

8. Your involvement in the research project will be a maximum of 10 months, including the 10 week yoga course, followed by three month follow up. The duration of the research project will be 12-18 months including data analysis.

9. All participants will be provided with a yoga mat, block, strap (at week 3), yoga journal, handouts and a certificate of completion at the end of the 10 weeks of their yoga course.

The yoga course will take place at the SALHN Recovery College in Noarlunga and there will be no participant choice regarding location. The total time commitment for the yoga group is twice weekly yoga classes of one hour duration, optional home practice of 5-10min/day and weekly journal (10-15min) for 10 weeks and pre, mid and post measures taking 15-20minutes to complete each time.

This research project has been designed to make sure the researchers interpret the results in a fair and appropriate way and avoids study researchers or participants jumping to conclusions.

There are no additional costs associated with participating in this research project, nor will you be paid. All interventions required as part of the research project will be provided to you free of charge.

It is a requirement that your local doctor (GP) is advised of your decision to participate in this research project and you will be required to obtain medical clearance from your GP to participate. If you decide to participate in this research project, the research team will inform your local doctor in writing.

4 What do I have to do?

The eligibility criteria must be met to participate in the study, you must complete the yoga registration and medical form including signed medical clearance from your GP to participate and you must provide permission for the research team to liaise with your care coordinator/community mental health team.

-There are no restrictions on other physical activities/sport in which you participate
-There are no dietary restrictions
-You should continue to take your usual medication/treatments as prescribed
-You may still give blood.

Yoga course group: Your commitment is to participate in the one hour twice weekly yoga group, yoga journal and home practice for 10 weeks to the best of your ability. You will also be required to complete pre, mid and post yoga course psychological and mental health measures including the Five Facet Mindfulness Questionnaire (FFMQ), Self-compassion Scale (SCS), Depression, Anxiety and Stress Scale 21 (DASS21), Mental Health Continuum well-being scale (MHC) and the Kessler Psychological Distress Scale (K10+) including at three month follow up, an evaluation/feedback form at the final session in week 10 and participate in an interview or focus group after the 10-week yoga course.

You are responsible for practising yoga within your physical and emotional capabilities and adhering to the safety guidance of the yoga teacher. If you do not follow the instructions of the yoga teacher you may be asked to leave the pilot yoga course and research project for your own safety and the safety of others.

Waitlist group: You will not receive any intervention over the 10-weeks but you will be required to complete pre, mid and post yoga course psychological and mental health outcome measures, including at week 10 and three month follow up. You will be offered the same yoga course intervention after completion of the first yoga course, in late 2018 or early 2019.

There are no other requirements or restrictions to fully participate in the study.

5 Other relevant information about the research project

This is Phase 3: Pilot yoga course with mental health consumers, of the research project. Phase 1: Survey to SA Yoga teachers and students was undertaken in 2014-2015. Phase 2: Consultation with Southern Mental Health consumers and staff and SA yoga teachers was undertaken in 2016. Phase 1 and phase 2 along with existing yoga research and protocols were used to guide the development of Phase 3: Pilot yoga course

There will be 20-30 participants involved overall in Phase 3 of the project and this is the only group and site involved.

6 Do I have to take part in this research project?

Participation in any research project is voluntary. If you do not wish to take part, you do not have to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage.

If you do decide to take part, you will be given this Participant Information and Consent Form to sign and you will be given a copy to keep.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your routine treatment, your relationship with those treating you or your relationship with SA Health or the University of Adelaide

7 What are the alternatives to participation?

You do not have to take part in this research project to receive treatment at this hospital/health service. This is an optional pilot yoga course that you may participate in, in addition and unrelated to your current treatment.

8 What are the possible benefits of taking part?

We cannot guarantee or promise that you will receive any benefits from this research; however, possible benefits may include:

- Learning about yoga practices, postures and strategies to improve symptoms of anxiety and depression
- Opportunity to socialise and meet new people
- Help to guide future research

9 What are the possible risks and disadvantages of taking part?

Psychological distress
You may experience emotional or psychological distress before, during or after practice or during discussions with other participants. If you become upset or distressed as a result of your participation in the research project, the research team will be able to arrange for counselling or other appropriate support. Any counselling or support will be provided by qualified staff who are not members of the research project team. This counselling will be provided free of charge.

Physical injury
While all care is taken to support you to undertake your yoga practice safely and under guidance of a qualified and experienced yoga teacher; you may still injure yourself as a result of incorrect technique or accident. If you do injure yourself during yoga practice medical aid will be sought for you as required. It is important you practice safely and within your physical and emotional limits and inform the yoga teacher of any pre-existing injury/health condition and of any injury obtained during practice. If you do not follow the instructions of the yoga teacher you may be asked to leave the pilot yoga course and research project for your own safety and the safety of others.

Confidentiality
Whilst all care will be taken to maintain privacy and confidentiality, you may experience embarrassment if one of the group members were to repeat things said during the yoga class.

10 What if new information arises during this research project?

Sometimes during the course of a research project, new information becomes available about the treatment that is being studied. If this happens, the research team will tell you about it and discuss with you whether you want to continue in the research project. If you decide to withdraw, your regular health care will not change and will continue. If you decide to continue in the research project you will be asked to sign an updated consent form. Also, on receiving new information, the research team might consider it to be in your best interests to withdraw you from the research project. If this happens, he/ she will explain the reasons and your regular health care will continue.

11 Can I have other treatments during this research project?

Whilst you are participating in this research project, you may continue the medications or treatments you have been taking for your condition or for other reasons. It is important to tell the research team about any treatments or medications you may be taking, including over-the-counter medications, vitamins or herbal remedies, acupuncture or other alternative treatments. You should also tell the research team about any changes to these during your participation in the research project.

12 What if I withdraw from this research project?

If you do consent to participate, you may withdraw at any time. If you decide to withdraw from the project, please notify a member of the research team before you withdraw. If you do withdraw, you will be asked to complete and sign a 'Withdrawal of Consent' form; this will be provided to you by the research team.

If you decide to leave the research project, the researchers will not collect additional personal information from you, although personal information already collected will be retained to ensure that the results of the research project can be measured properly and to comply with law. You should be aware that data collected up to the time you withdraw will form part of the research project results. If you do not want your data to be included, you must tell the researchers before you join the research project.

13 Could this research project be stopped unexpectedly?

This research project may be stopped unexpectedly for a variety of reasons such as:

- Unacceptable side effects
- Resource availability
- Change in direction of research

14 What happens when the research project ends?

The yoga course will not be available after the research finishes; however local yoga classes (at a cost) that participants may be able to access in the community will be discussed.

Participants can register their interest to be provided with a summary of the results of the pilot yoga course, which will be available by email or hard-copy late 2019.

Part 2 How is the research project being conducted?

15 What will happen to information about me?

By signing the consent form you consent to the research team collecting and using personal information about you for the research project. Any information obtained in connection with this research project that can identify you will remain confidential. Any potential identifying data will not be used in the reporting of this research; only aggregate results will be analysed and presented. The data is confidential and only the research team will have access. On completion of the research we will remove these details from the data that will be stored securely for five years. Your information will only be used for the purpose of this research project and it will only be disclosed with your permission, except as required by law.

Any information obtained during the research project are subject to inspection (for the purpose of verifying the procedures and the data) by the identified institution relevant to this Participant Information Sheet, SA Health and the University of Adelaide, or as required by law. By signing the Consent Form, you authorise release of, or access to, this confidential information to the relevant study personnel and regulatory authorities as noted above.

It is anticipated that the results of this research project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified, except with your permission. Confidentiality will be maintained by no mention of your specific name or personal details but use of aggregate results from the pilot yoga course.

Information about your participation in this research may be recorded in your health records.

In accordance with relevant Australian and/ or South Australian privacy and other relevant laws, you have the right to request access to your information collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. Please contact the study team member named at the end of this document if you would like to access your information.

Any information obtained for the purpose of this research project *and for the future research described in Section 16* that can identify you will be treated as confidential and securely stored. It will be disclosed only with your permission, or as required by law.

16 Complaints and compensation

If you suffer any injuries or complications as a result of this research project, you should contact the research team as soon as possible and you will be assisted with arranging appropriate medical treatment. If you are eligible for Medicare, you can receive any medical treatment required to treat the injury or complication, free of charge, as a public patient in any Australian public hospital.

17 Who is organising and funding the research?

This research project is being conducted by Nicole Snaith of the University of Adelaide.

SA Health and/or the University of Adelaide are unlikely to benefit financially from this research project.

You will not benefit financially from your involvement in this research project even if, for example, your information/input provided during the pilot yoga course (or knowledge acquired from analysis of your information/input) prove to be of commercial value to SA Health and/or the University of Adelaide. In addition, if knowledge acquired through this research leads to discoveries that are of

commercial value to SA Health and/or the University of Adelaide, the researchers or their institutions, there will be no financial benefit to you or your family from these discoveries.

No member of the research team will receive a personal financial benefit from your involvement in this research project (other than their ordinary wages).

18 Who has reviewed the research project?

All research in Australia involving humans is reviewed by an independent group of people called a Human Research Ethics Committee (HREC). The ethical aspects of this research project have been approved by Southern Adelaide Clinical HREC and the University of Adelaide HREC.

This project will be carried out according to the *National Statement on Ethical Conduct in Human Research (2007)*. This statement has been developed to protect the interests of people who agree to participate in human research studies

19 Further information and who to contact

The person you may need to contact will depend on the nature of your query. If you want any further information concerning this project or if you have any medical problems which may be related to your involvement in the project (for example, any side effects), you can contact the research team on 8313 3866 or any of the following people:

Clinical contact person

Name	Dr Philippa Rasmussen
Position	Senior Lecturer – School of Nursing
Telephone	8313 3866
Email	Philippa.rasmussen@adelaide.edu.au

For matters relating to research at the site at which you are participating:

Complaints contact person

Institution	Southern Adelaide Local Health Network
Position	Director, Office for Research
Telephone	
Email	Health.SALHNofficeforresearch@sa.gov.au

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about being a research participant in general, then you may contact:

HREC approving this research and HREC Executive Officer details

Reviewing HREC name	Southern Adelaide Clinical HREC
Position	Executive Officer
Telephone	
Email	Health.SALHNofficeforresearch@sa.gov.au

Reviewing HREC/Local HREC Office contact (Single Site – Research Governance Officer)

Institution	Southern Adelaide Local Health Network
Position	Research Governance Officer
Telephone	
Email	Health:SALHNofficeforresearch@sa.gov.au

Consent Form - *Adult providing own consent*

Title	Yoga and mental health pilot study: the effectiveness of a 10-week yoga course on outcomes in a consumer group: a randomised controlled trial
Short Title	Yoga and mental health pilot study
Protocol Number	
Project Sponsor	N/A
Coordinating Principal Investigator/ Principal Investigator	Dr Tim Schultz Nicole Snaith Leanne Rootsey (Co-Principal Investigator)
Associate Investigator(s)	Dr Philippa Rasmussen Dr Michael Proeve
Location	SALHN Recovery College, Noarlunga Centre

Declaration by Participant

I have read the Participant Information Sheet or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research described in the project.

I give permission for my doctors and other health professionals to release information to the University of Adelaide concerning my health condition and treatment for the purposes of this project. I understand that such information will remain confidential.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time during the study without affecting my future health care.

I understand that I will be given a signed copy of this document to keep.

Name of Participant (please print) _____

Signature _____ Date _____

Name of Witness* to Participant's Signature (please print) _____

Signature _____ Date _____

* Witness is not to be the investigator, a member of the study team or their delegate. In the event that an interpreter is used, the interpreter may not act as a witness to the consent process. Witness must be 18 years or older.

Declaration by Care Coordinator

I have given a verbal explanation of the research project, its procedures and risks and I believe that the participant has understood that explanation.

Name of
Care Coordinator (please print) _____

Signature _____ Date _____

Note: All parties signing the consent section must date their own signature.

I understand that, if I decide to discontinue the study treatment, I may be asked to attend follow-up visits to allow collection of information regarding my health status. Alternatively, a member of the research team may request my permission to obtain access to my medical records for collection of follow-up information for the purposes of research and analysis.

Name of Participant (please print) _____

Signature _____ Date _____

Name of Witness* to
Participant's Signature (please print) _____

Signature _____ Date _____

* Witness is not to be the investigator, a member of the study team or their delegate. In the event that an interpreter is used, the interpreter may not act as a witness to the consent process. Witness must be 18 years or older.

Name of
Care Coordinator (please print) _____

Signature _____ Date _____

Note: All parties signing the consent section must date their own signature.

Form for Withdrawal of Participation - *Adult providing own consent*

Title	Yoga and mental health pilot study: the effectiveness of a 10-week yoga course on outcomes in a consumer group: a randomised controlled trial
Short Title	Yoga and mental health pilot study
Protocol Number	
Project Sponsor	Nil
Coordinating Principal Investigator/ Principal Investigator	Dr Tim Schultz Nicole Snaith Leanne Rootsey (Co-Principal Investigator)
Associate Investigator(s)	Dr Philippa Rasmussen Dr Michael Proeve
Location	SALHN Recovery College, Noarlunga Centre

Declaration by Participant

I wish to withdraw from participation in the above research project and understand that such withdrawal will not affect my routine treatment, my relationship with those treating me or my relationship with SA Health or the University of Adelaide.

Name of Participant (please print) _____

Signature _____ Date _____

Name of Witness* to Participant's Signature (please print) _____

Signature _____ Date _____

Declaration by Researcher†

I have given a verbal explanation of the implications of withdrawal from the research project and I believe that the participant has understood that explanation.

Name of Researcher (please print) _____

Signature _____ Date _____

Note: All parties signing the consent section must date their own signature.

Appendix 23. Phase 4 – Focus group questions

FOCUS GROUP QUESTIONS

1. What did you like and dislike about the yoga course?
2. a. What yoga practices (e.g. specific breathwork, meditation and/or postures) did you find beneficial and how/why?

   b. Were there any specific yoga practices or sequences that you found helpful for symptoms of anxiety and depression?
3. Did you notice any changes (positive or negative) in yourself (physical, mental and/or emotional) with regular yoga practice?
4. Did you find home practice beneficial? If so how and if not why/how?
5. Did you experience any other benefits from yoga practice or attending yoga classes (e.g. Social interaction, routine, meeting new people)?
6. What environmental factors do you think are important in a yoga class?
7. Do you think you will continue your yoga practice in classes or home and how often?
8. What are the barriers to accessing yoga in the general community?
9. What would help more people with anxiety and depression and other mental health problems take up yoga and commit to a regular practice?
10. Any other comments/suggestions/feedback?