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"Exploring Acceptance and Commitment Processes as Predictors of Subjective Wellbeing in Student Practitioners"

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Acknowledgements

"The sun rises in spite of everything, and the far cities are beautiful and bright. I lie here in a riot of sunlight watching the day break and the clouds flying. Everything is going to be all right" (Derek Mahon).

The past five years have been a long and difficult journey for me through professional training. In my personal life I experienced challenges that, at times, felt insurmountable. Sadly, my mother passed away during this time. I would like to take this opportunity recognise the endless love, support and guidance my mum provided me with over the years. Without this, I am sure that I would not have made my way through training, and overcome such challenges. She continues to inspire me every single day- her quiet strength, wisdom, humour and ability to make everyone smile. Thank you mum. I hope this makes you proud.

I would also like to thank my husband James, for his never-ending support (and patience) over the past few years. Thank you to my sister Christina for her support, as well as my Dad too. To my good friends- no more work at weekends (*I promise*). Finally, I would like to express my sincere gratitude to my research supervisors, Dr Ross White, Dr Linda Steadman and Dr James Reilly. Thank you also to Lillie Benson for her help with review screening. The research process has been an immensely enjoyable experience with such a warm, knowledgeable and helpful team. I must also finally thank James Reilly in his other role as my personal tutor- you have been "a rock" for me through training James- thank you.

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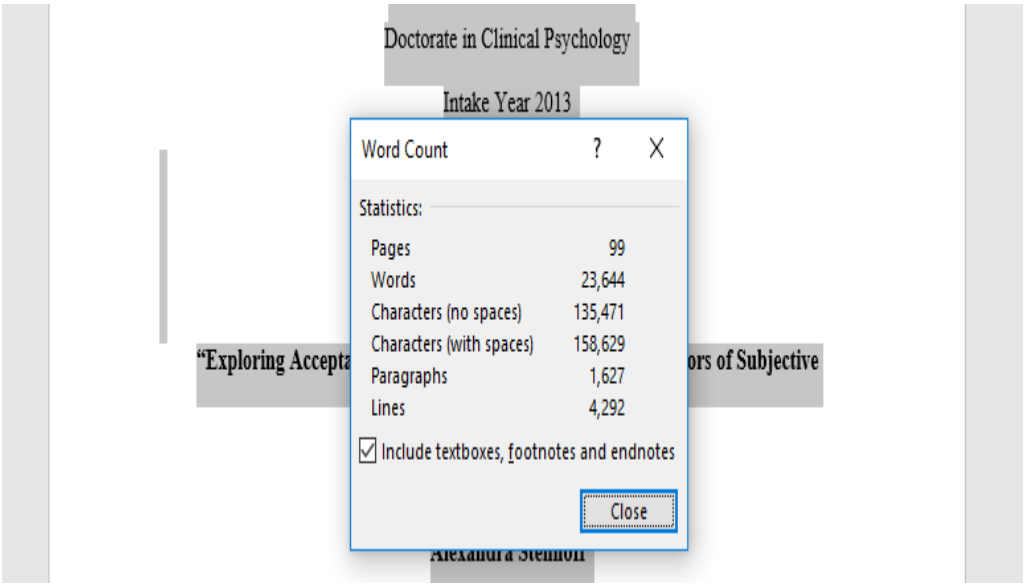

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Introductory Chapter: Thesis Overview

Subjective wellbeing (SWB) has been defined broadly as "a person's cognitive and affective evaluations of his or her life" (Diener, Lucas, & Oishi, 2002, pp.63). Conceptualizations of 'wellbeing' can be broadly distinguished into 'hedonic' and 'eudaemonic' approaches. The former, encompasses satisfaction with life, and an emotional equilibrium between positive affect (e.g. happiness) and negative affect (Larsen & Prizmic, 2008), whereas the latter relates to optimal, psychological functioning and the fulfilment of one's own potential (i.e. "self-acceptance", "environmental mastery", "positive social relationships", and "purpose in life") (Ryff & Keyes, 1995, pp.720). Acceptance and commitment therapy (ACT) is a trans-diagnostic psychological therapy, which focuses on the cultivation of wellbeing through enhanced valued living and the promotion of psychological flexibility). A range of measures have been utilised within the ACT literature to measure SWB, including the Mental Health Continuum- short form (MHC-SF) that measures both the hedonic and eudemonic aspects of wellbeing. Elevated levels of subjective wellbeing (SWB) may be referred to as 'flourishing', and low levels of SWB may be referred to as 'languishing'.

The main focus of the current thesis was to explore SWB in relation to ACT's theorised mechanisms of change. Psychological flexibility (purported to be the central mechanism of change in ACT) has previously been linked to SWB in clinical and non-clinical populations (e.g. Wersebe, Lieb, Meyer, Hofer, & Gloster, 2018). Additionally, ACT has shown promise for enhancing SWB in an increasing number of research trials (e.g. Grégoire, Lachance, Bouffard, & Dionne, 2018; Räsänen, Lappalainen, Muotka, Tolvanen, & Lappalainen, 2016).

In particular, the current thesis aimed to explore ACT processes in relation to medical, other healthcare and veterinary students collectively referred to here as student practitioners (SPs); a group that frequently report high levels of psychological distress, and decreased wellbeing during professional training (e.g. Dyrbye, Liselotte, Thomas, Matthew , Shanafelt & Tait, 2006). Amongst a number of commonly cited stressors and contributing factors related to training (i.e. demanding workloads, frequent exposure to the suffering of others), 'maladaptive perfectionism' has been associated with poor adjustment, psychological distress, depression, hopelessness and reduced wellbeing in this group (Henning, Ey, & Shaw, 1998; Enns, Cox, Sareen, & Freeman, 2001; Stoeber & Corr, 2016). Further research is needed in this area in order to understand and support improved health and SWB in SPs. Two papers are presented within this thesis.

Chapter 1 presents a systematic literature review which aims to synthesise and critically appraise published, randomised controlled trials (RCTs) of face-to-face and guided ACT interventions that have assessed SWB. Overall, 1108 participants were recruited on to the 11 included studies. The results of the risk of bias assessment highlighted the variable quality of the included studies across assessed domains. Methodological issues highlighted in the systematic review related to allocation concealment, handling of incomplete data, and small sample sizes. Five measures of SWB were utilised in the included studies, of which the most common measure used was the Mental Health Continuum-Short Form (MHC-SF). The findings indicated that guided, ACT interventions may be of benefit in enhancing SWB in clinical and non-clinical populations. The heterogeneity of included studies precluded meta-analysis. It was concluded that further RCTs that include standardised measures of SWB, are needed to facilitate a future meta-analysis of the research.

Chapter 2 presents an empirical study "Exploring Acceptance and Commitment Processes as Predictors of Subjective Wellbeing in Student Practitioners". The study aimed to

explore factors, and mediating processes (i.e. ACT related mechanisms of change, maladaptive perfectionism, and self-critical thoughts) as predictors of SWB in SPs. Furthermore, the study aimed to explore relationship between maladaptive perfectionism and SWB, and the potential mediating roles of psychological flexibility (the purported central mechanism of change targeted by ACT) in this relationship.

Two hundred and seventy four SPs took part in the online study. Four out of every ten SPs who participated in the study met clinical caseness for psychological distress, and less than half the sample reported experiencing the highest level of SWB ('flourishing'). Psychological flexibility was found to be the strongest predictor of SWB, followed by values-based action. Psychological flexibility (AAQ-II) was found to mediate the relationship between maladaptive perfectionism and SWB. Based on these findings, further research (pilot studies, RCTs) is merited in order to evaluate the efficacy of contextual behavioural science approaches (e.g. ACT) in this group, and to explore how interventions aimed at improving SWB in SPs might be best integrated into university curricula.

As both the systematic review and empirical paper will be submitted to The Journal of Contextual Science, both chapters are formatted in line with recommendations from this journal (See appendix A).

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Chapter 1: Acceptance and Commitment Therapy and Subjective Wellbeing: A Systematic Review of Randomised Controlled Trials

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Abstract

Background: In comparison to a more restricted focus on symptom-specific outcomes, clinical trials of psychological interventions are increasingly focusing on transdiagnostic outcomes such as subjective wellbeing (SWB). SWB has been broadly defined as a person's cognitive and affective evaluations of his or her life. Such evaluations may include appraisals of emotions and mood, satisfaction with life, and relationships with others. Acceptance and Commitment Therapy (ACT) has been shown to offer promise for improving SWB.

Objective: The current review aimed to address an important gap in the literature by synthesising and critically appraising the research findings of randomised controlled trials (RCTs) of face-to-face and guided ACT interventions that assessed SWB.

Method: Four electronic databases (Medline, PsycINFO, Scopus and Web of Science) were searched for relevant literature from inception. Searches identified 921 records. Eleven studies which met full inclusion criteria were identified via database and reference lists searches. Risk of bias was evaluated using the Cochrane Risk of Bias Tool (RoB).

Results/Conclusions: Overall, 1108 participants were recruited to the included studies; of which 32% (n=357 participants) were male. A wide variety of mental and physical health issues were included. Nine out of the eleven studies evidenced a significantly greater change in SWB compared to the control group/s. The results of the risk of bias assessment highlighted the variable quality of the included studies. Methodological issues highlighted in the current review related to allocation concealment, handling of incomplete data, and small sample sizes. Five different measure of SWBs were utilised in the included studies, of which the most commonly utilised measure was the Mental Health Continuum-Short Form (MHC-SF). The findings indicate that ACT interventions may be a beneficial in enhancing SWB in clinical and non-clinical populations. However, further RCTs that consistently use the same standardised measure(s) of SWB are necessary to facilitate a meta-analysis of the research.

Key words: Acceptance and Commitment Therapy; Psychological Flexibility; Subjective Wellbeing; Randomised Controlled Trials; Systematic Review.

Introduction

Developing interventions that aim to promote mental health has increasingly been recognised as a global priority (World Health Organisation, 2015). In the UK and Internationally, this agenda has been reflected in the burgeoning number of public policy, legislation, programmes and interventions which aim to enhance the mental health of individuals and their communities (e.g. Department of Health, 2014; New Economics Foundation, 2011; Office for National Statistics, 2018).

Conceptually, mental health promotion broadens the focus of researchers' and clinicians' attention towards improving indicators of well-being and health, in addition to more narrowly focused efforts to alleviate psychological distress or 'illness'. The 'dual-factor model of mental health' (Westerhof & Keyes, 2010) proposes that mental health and mental illness exist on distinct, yet related dimensions. A growing body of research evidence attests to the possibility that positive mental health (i.e. elevated subjective wellbeing; SWB)'buffers' against mental and physical illness(Grant, Guille, & Sen, 2013; Keyes, Dhingra, & Simoes, 2010; Steptoe, Docray & Wardle, 2009).As such, SWB has been highlighted as an important outcome for clinicians and researchers involved in delivery and evaluating psychological interventions respectively (Diener, Diener, & Tamir, 2004; Trompetter, De Kleine, & Bohlmeijer, 2017; White, Imperiale, & Perera, 2016).

SWB has been defined broadly as "a person's cognitive and affective evaluations of his or her life" (Diener, Oishi, & Lucas, 2002, pp.63), and has been proposed to consist of hedonic and eudaimonic aspects (Keyes, Shmotkin, & Ryff, 2002; Waterman, 1993). Hedonia relates to satisfaction with life, and an emotional equilibrium between positive affect (e.g. happiness) and negative affect (Diener, Emmons, Larsen, & Griffin, 1985; Deiner, Suh, Lucas, & Smith,

1999; Larsen & Prizmic, 2008). Eudaimonia concerns optimal, psychological functioning and fulfilment of one's own potential (i.e. "self-acceptance", "environmental mastery", "positive social relationships", and "purpose in life") (Ryff & Keyes, 1995, pp.720).

There exists a wealth of validated, self-report wellbeing measures for which underlying conceptualizations may be divided into hedonic and eudemonic traditions (*for a comprehensive review of measures see* Cooke, Melchert, & Connor, 2016). Increasingly, measures have been developed to capture both of these aspects of wellbeing. For example, Keyes (2002) argues that emotional (i.e. hedonic), psychological and social (both eudemonic) components constitute the core aspects of wellbeing. Furthermore, it is suggested that individuals may be classified as "flourishing", "languishing", or in "moderate mental health" depending on their levels of SWB as assessed by the Mental Health Continuum (MHC-SF/LF; Keyes, 2002). This theoretical understanding of wellbeing aligns closely with the World Health Organisation's (WHO) definition of mental health: "a state of wellbeing in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (2001, p.1).

Acceptance and commitment therapy (ACT) is a transdiagnostic intervention, which focuses on personal growth, and the cultivation of wellbeing through enhanced value-based living (Harris, 2011; Hayes, 2004). Underpinned by *functional contextualism*, ACT moves away from reductionist approaches to therapy that aim to correct the *content* of "dysfunctional" or "pathological" cognitions and behaviours; instead focusing on the *context* in which psychological and behavioural events occur. In ACT, psychological suffering is considered to be caused by a lack of "psychological flexibility", defined as "the ability to fully contact the present moment and the thoughts and feelings it contains without defence, and, persisting in or changing behaviour in the pursuit of goals and values" (Bond et al., 2011, pp. 678). In order to

enhance psychological flexibility, ACT draws on six therapeutic processes: *acceptance* (embracing internal experiences without altering their form or frequency); *cognitive defusion* (achieving psychological distance from internal experiences); *being present (*ongoing, non-judgemental contact with psychological and environmental events as they occur); *self-as-context* (observing or noticing ones' inner/ outer world, and flexible perspective taking); *values* (choosing valued life directions); and *committed action* (acting in service of one's chosen values).

Whilst ACT does not view symptom reduction itself as a primary goal, this can be a fortuitous by-product of enhanced psychological flexibility. Further, ACT takes a non-pathologising stance towards human distress, emphasising instead that distress is an inherent aspect of the human condition (Ramsey & Wade, 2015).

Reflecting an evidence-based practice focus on measuring the efficacy of interventions in terms of symptom reduction, a large proportion of ACT studies have focused on "disorders" and condition-specific outcomes (e.g. Beilby, Bymes, & Yaruss, 2012; Bohlmeijer, Fledderus, & Rokx, 2011; Lappalainen et al., 2014). A number of systematic reviews and meta-analysis have been conducted (Ost, 2014; Powers, Vording, & Emmelkamp, 2009; Swain, Hancock, Hainsworth, & Bowman, 2013). Research has demonstrated ACT's efficacy in relation to anxiety and depression (e.g. Forman, Herbert, Moitra, Yeomans, Geller, 2007) and a range of mental health difficulties (e.g. Gratz & Gunderson, 2006; Hayes, 2004) and physical health conditions (e.g. Dahl, Wilson, & Nilsson, 2004). Yet there have been recent calls for research efforts to focus on transdiagnostic outcomes such as SWB (Fledderus, Bohlmeijer, Smit, & Westerhof, 2010; French, Golijani-Moghaddam, & Schröder, 2017; Trompetter, Bohlmeijer, Lamers, & Schreurs, 2016).

In the current review, the author seeks to address an important gap within the literature base, by synthesising and critically appraising the research findings of randomised controlled

trials (RCTs) of face-to-face and guided ACT interventions that have assessed SWB. Face-to-face and guided interventions were chosen as the focus of this review, as they have been shown to be superior to unguided interventions within the literature (Anderson & Titov, 2014; French et al., 2017; Richards & Richardson, 2012). The current study aimed to evaluate the methodological rigor of RCTs of ACT interventions; the ranges of standardised SWB measures being used; and the reported efficacy of ACT for bringing about changes in SWB. Specifically, the current review aimed to address the following questions:

1. What is the range of SWB measures used as outcome measures in ACT RCT intervention studies?
2. What is the efficacy of ACT for bringing about changes in subjective well-being?
3. What risks of bias are inherent in the relevant studies?

Method

Pre-registration of the systematic review protocol

The protocol for this review was registered with the International Prospective Register of Systematic Reviews (PROSPERO) number CRD42018097352.

Search strategy

Following initial scoping searches, four electronic databases (Medline, PsycINFO, Scopus and Web of Science) were searched for relevant literature from inception to July 2018. Search terms were adapted from a previous, published review exploring SWB in a clinical sample (Schrank et al., 2013). An information specialist with expertise in bibliographic

databases was consulted, and helped in devising the final search strategy. As ACT is a transdiagnostic approach, and in keeping with the exclusion criteria for this review, no 'disorder' or condition-specific keywords were included. The following search terms were used:

("well-being'" OR "wellbeing" OR "wellness" OR "happiness" OR "happy" OR "thriv*" OR "flourish*"O R "pleasure" OR "joy" OR "life ADJ2 satisfaction" OR "satisfaction ADJ2 with life" OR "strength*"OR "blessing*" OR "virtue*" OR "good ADJ2 life" OR "fulfilment" OR "eudaimonia" OR "eudaemonia" OR "hedonism") AND ("randomi*ed controlled trial" OR "controlled clinical trial" OR "groups" OR "trial" OR "treatment as usual" OR "TAU" OR "control*" OR "randomi*d" OR "waitlist*" OR "placebo") AND ("Acceptance and Commitment Therapy" OR "ACT ADJ3 treatment* OR "ACT ADJ3 intervention*" OR "ACT ADJ3 therap*).

Search terms were adjusted for each database, including the use of MeSH terms and Cochrane filters (Higgins & Green, 2011) as required. English language limiters were applied in three databases (Medline, Scopus, and Web of Science) and in Medline results were restricted to human participants. Appendix B details a full search conducted in Medline.

Additionally, all reference lists of the included studies, as well as recently published, systematic reviews relevant to the review topic were searched (e.g. Brown, Glendenning, Hoon, & John, 2016; French et al., 2017). Finally, experts in the field were contacted by email regarding any additional papers which met the specified inclusion criteria.

Study selection

Studies were included in the current review providing they met the following inclusion criteria: a) were RCTs of interventions described by authors as "Acceptance and Commitment

Therapy" or "ACT"; b) were delivered in either group, one-to-one format, or guided/supported form of ACT self-help intervention (i.e. an ACT intervention where the participant had at least minimal contact with a practitioner linked to the intervention); c) included a comparative group (i.e. either active comparison interventions, and/or a non-active control); d) included a standardised measure of SWB[1] (*see* Cooke et al., 2016 and Appendix C) pre and post intervention as either a primary or secondary outcome; e) reported data from adult participants (18 years or older); f) were published in a peer-reviewed journal. Reviews, case studies, protocols, discussion articles, and all other study designs (other than RCTs) were excluded. Any reanalysis of data from previously published studies, and papers not published in the English language were also excluded from the review. Lastly, ACT interventions combined with another form of intervention (e.g. ACT plus behavioural activation), or unguided/ unsupported ACT interventions were excluded.

Following the searches, and removal of all duplicate records, titles and abstracts were simultaneously screened to assess their eligibility for inclusion. To ensure systematic article selection, a screening tool was used (Appendix D). Full papers of potentially relevant articles were then assessed. Screening was undertaken at both stages independently by A.S and an assistant psychologist (L.B). Agreement at both stages was high (stage 1:98%, stage 2: 94%). Any differences in judgement were discussed and resolved. A third reviewer was available to resolve any discrepancies; however this was not necessary as consensus was reached in all instances.

[1] Note: Where a SWB measure was not listed by Cooke, Melchert, & Conner (2016) (Appendix B) the authors considered the measure against criteria set out by Cooke et al. (2016) One study (Grégoire, Lachance, Bouffard, T., & Dionne, 2018) was included in the current review on this basis.

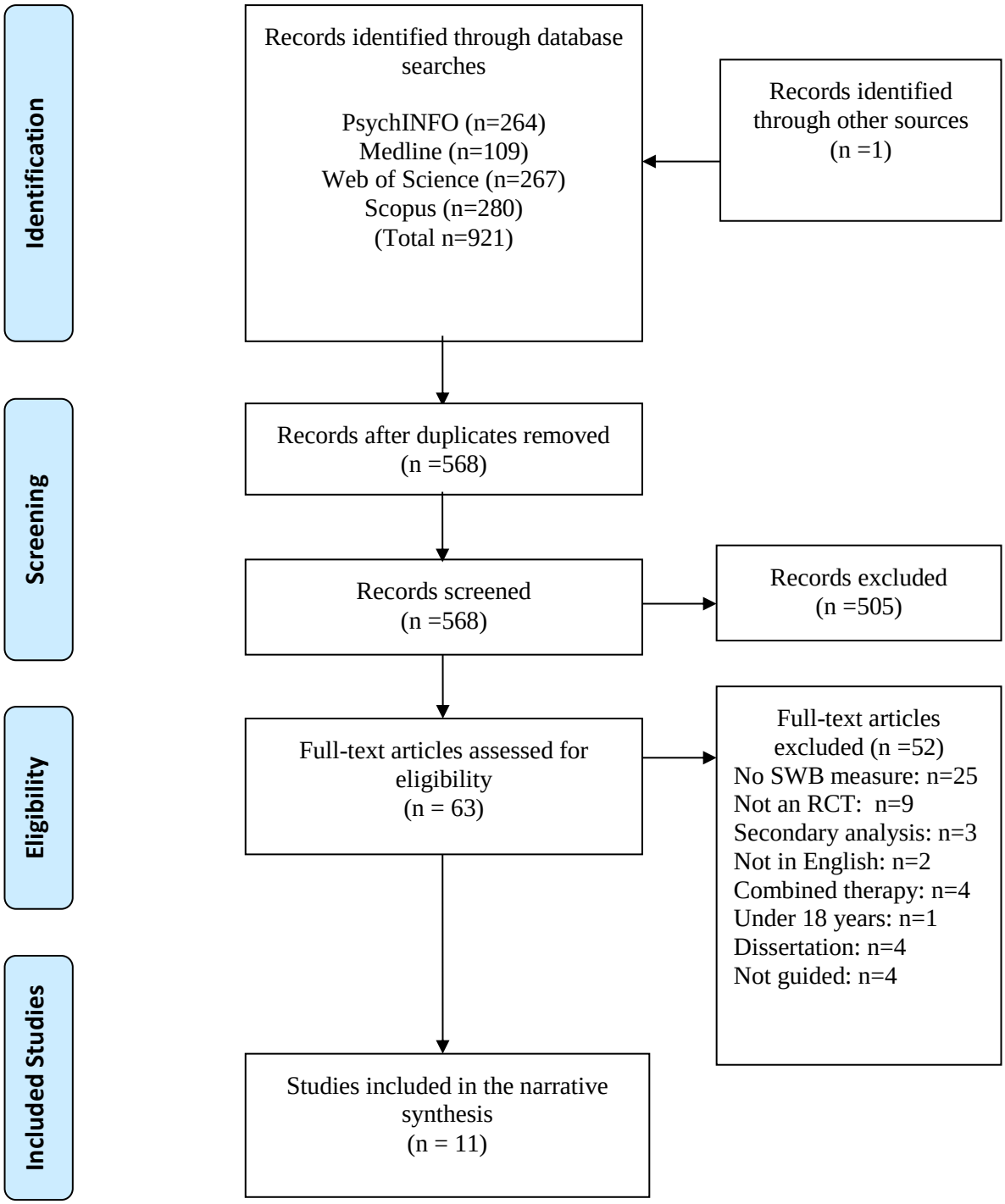
Risk of bias

The Cochrane Risk of Bias Tool (RoB; Higgins & Green, 2011) was used to evaluate risk of bias. The use of this tool is endorsed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Liberati et al., 2009), and it is widely used in the evaluation of methodological quality of RCTs. The tool includes six domains: (1) "random sequence generation", (2) "allocation concealment", (3) "blinding of participants and personnel", (4) "blinding of outcome assessment", (5) "incomplete outcome data", (6) and "selective outcome reporting". In line with recommendations by Munder & Barth (2017) when using RoB in the context of psychological intervention research, a seventh domain was also considered (7) deviations from intended interventions. Emphasized in the revised RoB (2.0) presently at the draft stage (Higgins et al., 2016) this domain allowed consideration of treatment adherence, and integrity. Each domain was assessed as being either 'low', 'high' or 'unclear' in terms of risk of bias. Appendix E and F illustrates the criteria. Assessments were undertaken by A.S and L.B. Consensus was high (92%), and disagreements were resolved though discussion, without the need for arbitration from a third reviewer.

Data extraction and analysis

Sample demographics, study characteristics and outcomes were extracted using a data extraction form devised specifically for this systematic review. This form was checked independently for accuracy and completeness by L.B. Disagreements were again resolved through discussion. Details of all outcome measures utilised in each study were collated, yet results were only extracted for measures of SWB in line with the aims of this review. Heterogeneity in participant characteristics, outcome measures and diversity in intervention formats precluded a meta-analysis. A narrative synthesis is therefore presented

Figure 1: PRISMA flow diagram.



Results

Figure 1 illustrates the PRISMA flow from searches to included articles as recommended by PRISMA guidelines. The searches identified 921 records, of which 11 studies met full criteria and are included in the current review.

Sample Characteristics and Demographics

Overall, 1108 participants were recruited to the included studies. Of the ten studies that reported gender numbers 32% (n=357 out of 1108 participants) were male. Azkhosh, Farhoudianm, Saadati, Shoaee, and Lashani (2016) did not report information on gender. One study did not report the ages of participants (Bayati, Abbasi, Bashiri, Dehghan, & Yazdanbakhsh, 2017). The median for the mean age of participants from the remaining ten studies that did report this information was 44 (Interquartile range=27-50). Studies were from a range of countries including: four from the Netherlands (Fledderus et al., 2010; Fledderus, Bohlmeijer, Pieterse, & Schreurs, 2012; Pots et al., 2016; Trompetter, Bohlmeijer, Veehof, & Schreurs, 2014); one from the UK (Majundar & Morris, 2018); one from Sweden (Thorsell et al., 2011); one from Canada (Grégoire, Lachance, Bouffard, & Dionne, 2018); two from Iran (Azkhosh et al., 2016; Bayati et al., 2017);one from Finland (Räsänen, Lappalainen, Muotka, Tolvanen, & Lappalainen, 2016); and one from India (Lundgren, Dahl, Yardi, & Melin, 2008). Of the studies that recruited from clinical settings, a range of physical and mental health difficulties were targeted including participants with: an addiction to opiates (Azkhosh et al., 2016); multiple sclerosis (Bayati et al., 2017); chronic pain (Thorsell et al., 2011); a previous history of stroke/s (Majundar & Morris, 2018); drug-refractory epilepsy (Lundgren et al., 2008) and mild-moderate distress (Fledderus et al., 2010). Of those studies that recruited from the general population (non-clinical settings) two studies included participants with symptoms of depression (Fledderus et al., 2012; Pots et al., 2016); one included participants with self-

reported distress including anxiety, stress, low mood and/or anxiety (Räsänen et al., 2016); one study included participants with chronic pain (Trompetter et al., 2014) and one study was aimed at mental health promotion (Grégoire et al., 2018). Table 2 illustrates participants' characteristics across the included studies.

Results of risk of bias

A risk of bias graph (Figure 2), alongside the risk of bias assessment is illustrated in Figure3. In line with recommendations from the Centre for Review and Dissemination (CRD, 2009) domain ratings were not summed to provide an overall risk of bias for each study. Common methodological problems highlighted across the included trials related to allocation concealment, incomplete data, and small sample sizes.

Nine of the included studies reported adequate methods for "random sequence generation" such as computer generated random sequences and drawing of lots (Fledderus et al., 2010; Fledderus et al., 2012; Grégoire et al., 2018; Lundgren et al., 2008; Majundar & Morris, 2018; Pots et al., 2016; Räsänen et al., 2016; Thorsell et al., 2011; Trompetter et al., 2014). These studies were therefore deemed low risk of selection bias. In two studies, the authors presented insufficient information to assess risk of selection bias (Azhosh et al., 2016; Bayati et al., 2017). Only four studies were considered to be at low risk of selection bias ("allocation concealment") as allocation in these RCTs was undertaken by parties external to the research team (Fledderus et al., 2010; Grégoire et al., 2018; Majundar & Morris, 2018; Räsänen et al., 2016). All other studies were deemed an unclear risk.

With regards to "blinding of participants and personnel", a high risk of performance bias was found across all studies. This is reflective of psychotherapy research in general, as blinding of participants and therapists in intervention trials of this nature is unfeasible (Munder & Barth, 2017). As all included studies reported self-report measures, participants were considered to be equivalent to "blind clinical observers" as is common practice in systematic

reviews of therapy trials (Munder & Barth, 2017, pp. 6) meaning that detection bias was assessed as 'low risk' in all included studies.

The majority of studies assessed outcomes over three time-points; pre-and-post intervention and follow-up (ranging from 6 weeks to 12 months) (Azhosh et al., 2016; Fledderus et al., 2010; Fledderus et al., 2012; Majundar & Morris, 2018; Rasanen et al., 2016; Trompetter et al., 2014).Three studies included four assessment time-points; pre and post intervention and follow-up assessments at 6 and 12 months (Lundgren et al., 2008; Pots et al., 2016; Thorsell et al., 2011). Two remaining studies included only pre-and-post assessments (Bayati et al., 2017; Grégoire et al., 2018).

When handling incomplete outcome data, six studies used intention-to-treat analysis, and were deemed low risk of attrition bias (Fledderus et al., 2010; Fledderus et al., 2012; Pots et al., 2016; Räsänen et al., 2016; Thorsell et al., 2011; Trompetter et al., 2014). Of the remaining five studies, one had no attrition and was also classed as low risk (Lundgren et al., 2008); two provided insufficient information on attrition, the reasons for drop-out or how missing data was handled and were therefore deemed as an unclear risk (Azhosh et al., 2016; Bayati et al., 2017); and two studies used inappropriate simple imputation methods (last observation carried forward) when handling missing data and were consequently deemed at 'high risk' of attrition bias (Grégoire et al., 2018; Majundar & Morris., 2018).

Three study protocols were available and located, which reported all pre-specified outcomes in the published paper, and as such were deemed low risk of selection bias (Pots et al., 2016; Trompetter et al., 2014). One study made reference to a protocol, yet on inspection did not report all pre-specified outcomes listed in the final paper. This study was therefore judged as high risk (Bayati et al., 2017). Whilst the other studies did not make reference to a published protocol, they were also considered low risk as the papers reported all expected outcomes that were specified in the aims and hypotheses section of the report.

An additional domain "deviations from intended interventions" was also considered (Higgins, et al., 2016). As highlighted by Munder and Barth (2017) where blinding patients and therapists are not possible (as with all therapeutic trials), low risk of bias in this domain needs to be ensured by providing sufficient information regarding treatment implementation. Of the six studies that included at least one active comparison group, four were judged as low risk. These studies provided detailed descriptions of interventions, of which the majority were manualised. Supervised therapist training and/or checks for therapy fidelity were documented. Treatment dosage (e.g. length, format), and participants' levels of adherence were also balanced across active groups (Fledderus et al., 2012; Pots et al., 2016; Thorsell et al., 2011; Trompetter et al., 2014).

The remaining two studies were deemed an unclear risk in terms of "deviations from intended interventions" due to insufficient information regarding treatment integrity or participant adherence. Of the five studies with non-active controls (e.g. WLC) three were judged as low risk as detailed descriptions of interventions, therapist training, and fidelity measures were provided. Additionally, participant adherence was high (all participants completing at least 75% of the intervention) (Grégoire et al., 2018; Majundar & Morris, 2018; Rasanen et al., 2016). The remaining two studies with non-active controls, were deemed an unclear risk (Bayati et al., 2017; Fledderus et al., 2010).

Figure 2: Risk of Bias Graph

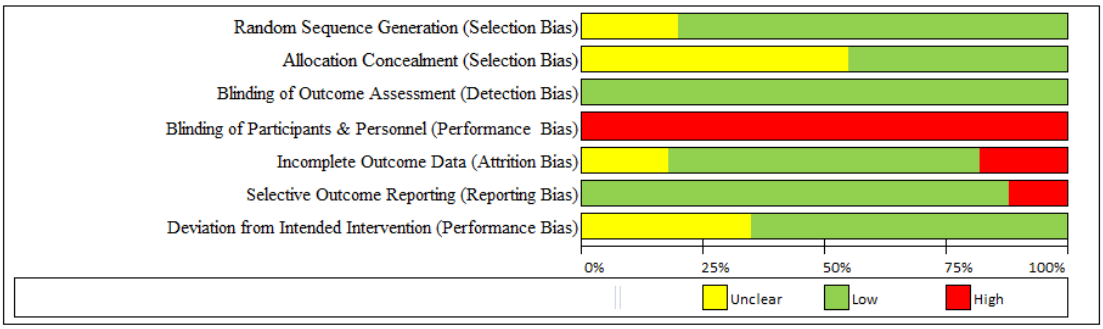
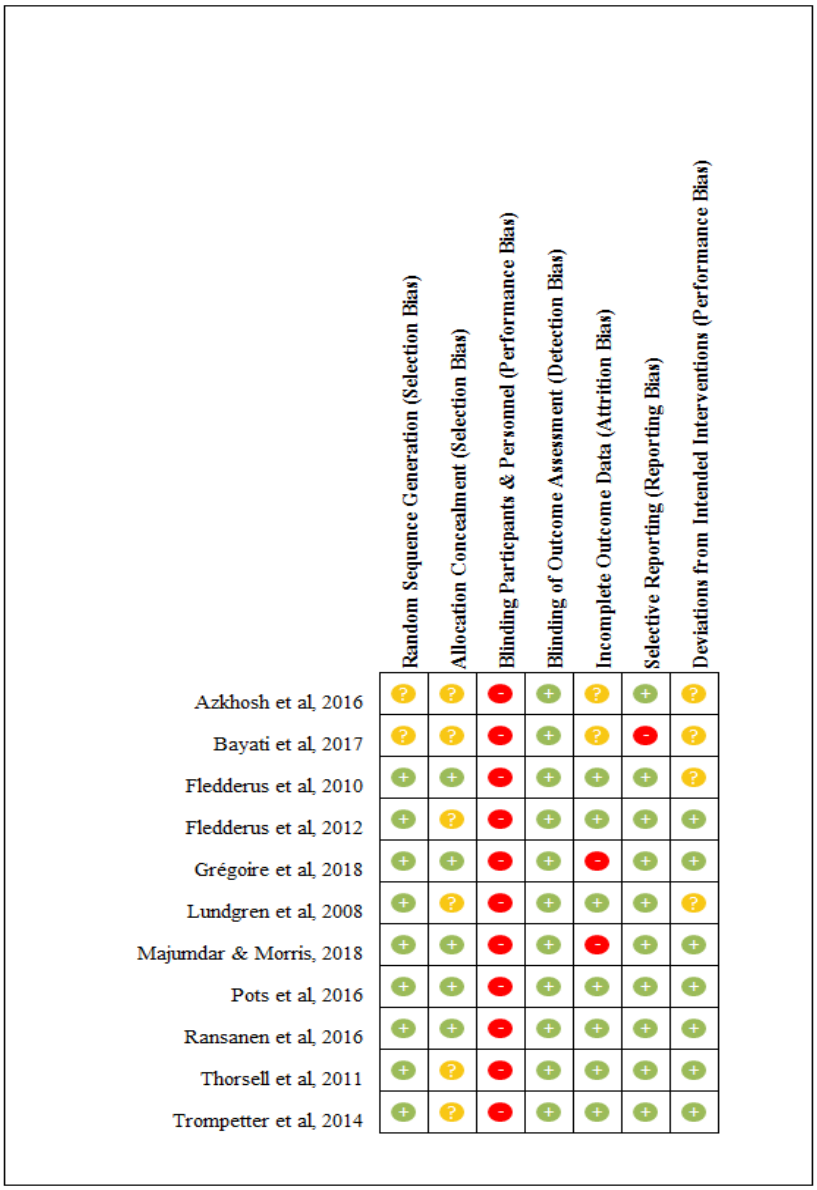


Figure 3: Summary of Assigned Risk of Bias Categories



Study Designs

In line with criteria of the review all of the studies were RCTs, and included either an active comparison (*n*=2: Lundgren et al., 2008; Thorsell et al., 2011); a non-active control (*n*=5: Bayati et al., 2017; Fledderus et al., 2010; Gregorie et al., 2018; Majumdar & Morris, 2018; Räsänen et al., 2016) or both (*n*=4; Azkhosh et al., 2016; Fledderus et al., 2012; Pots et al., 2016; Trompetter et al., 2014).Table 3 summarises study characteristics, and findings for all included studies.

Intervention characteristics

Five studies investigated interventions delivered in a group format (Azkhosh et al., 2016; Bayati et al., 2017; Fledderus et al., 2010; Gregorie et al., 2018; Majumdar & Morris., 2018). These studies compared ACT group/s to predominantly non-active control groups, with only one study including an active comparison: a Narcotics Anonymous Group (NA; Azkhosh et al., 2016). The majority of interventions were manualised, and included detailed description of the core ACT processes and techniques covered in sessions (n=4). Only one study did not provide details of the ACT intervention (Azkhosh et al., 2016). Group sessions were delivered weekly in all five studies, with each session lasting between 1.5-2.5 hours. The duration of these interventions ranged from four to 12 weeks. Group sizes/and or the number of groups were not specified in the majority of these studies.

In three studies, groups were delivered across multiple sites (Fledderus et al., 2010; Gregorie et al., 2018; Majumdar & Morris, 2018). Additionally one study included a mixed intervention (group and individual sessions) (Lundgren et al., 2008). In this study, a manualised ACT intervention was compared to a Yoga intervention. Over a period of five-weeks, all participants were offered two individual sessions and two group sessions. Booster sessions were also delivered at six and twelve months.

Five studies included guided, self-help interventions; of which three were delivered via an online website (Pots et al., 2016; Räsänen et al., 2016; Trompetter et al., 2014). Two of these studies included an active comparison: an expressive writing (EW) online intervention (Pots et al., 2016; Trompetter et al., 2014). All of these online studies provided detailed descriptions of the core ACT processes and techniques covered in the online modules. The number of modules completed ranged from 5-9 modules, delivered over the duration of 7-12 weeks. Weekly email support and feedback, as well as reminder texts were sent to participants in these online, guided self-help interventions. Lastly, two studies delivered guided, self-help interventions through the provision of self-help books to participants (Fledderus et al., 2012; Thorsell et al., 2011). Fledderus et al (2012) compared two ACT interventions: a self-help book with minimal guidance (i.e. standardized emails and positive encouragement), to an extensive guidance condition (i.e. personalised email feedback and advice), and a waiting list control (WLC). Thorsell et al (2011) compared participants given an ACT self-help book, to an applied relaxation (AR) manual. In both interventions, participants received two individual sessions, and weekly telephone guidance and support. The duration of these interventions were between 7-9 weeks.

The majority of interventions were delivered by clinical psychology trainees/ students (n=6), followed by clinical psychologists and other health-care professionals (i.e. care co-ordinators, assistant psychologists) (n=3). In two studies the profession of those that delivered the interventions was not specified by the authors (Askhosh et al., 2016; Bayati et al., 2007).

Study attrition

Ten out of the included studies included data on attrition. Only one study failed to report this information (Bayati et al., 2017). In these studies, non-active control groups had a mean average of 11% (range=0-42%) attrition at time point 1 (T1; post-intervention), in comparison to intervention groups 23% (range= 0-50%). Of those studies that included follow-ups (FUP) and associated attrition rates (Fledderus et al., 2010; Fledderus et al., 2012; Lundgren et al., 2008; Majumdar & Morris, 2018; Pots et al., 2016; Räsänen et al., 2016; Thorsell et al., 2011; Trompetter et al., 2014) attrition rates at FUP (T2; ranging from 8-52 weeks) were, as could be expected, higher (overall mean in passive control and intervention groups=28%; range=0-56%). Three studies included a second FUP (T3; all at 52 weeks) (Lundgren et al., 2008; Pots et al., 2016; Thorsell et al., 2011). In these studies the mean attrition rate at this time point (across all groups) was 31% (range= 0-73%).

Standardised Wellbeing Measures

The included studies utilised a number of different, validated measures of SWB. Authors did not explicitly state why each measure was chosen. In five of the included studies, the Mental Health Continuum-Short-Form (MHC-SF) was used. Two studies used the Psychological Well-being (PWB) scale. In two studies the Satisfaction with Life Scale (SWLS) was utilised. Finally, one study included the Warwick and Edinburgh Mental Well-being Scale (WEMWBS), and one study used the Well-being Manifestation Scale (WBMMS).As noted previously, the decision was made to include the WBMMS in our review, as although it was not included as a standardised measure of wellbeing in the review by Cooke et al (2016), it did meet criteria specified in this previous review of SWB measures. Furthermore, there were available details of reliability and validity for this measure (Massé et al., 1998). Table 1 provides a summary of the different SWB measures used in the studies.

Table1: Summary of SWB Measures Utilised in the Included Studies

Outcome measure	Brief Description	Studies
Mental Health Continuum- Short Form (MHC-SF)	Three domains: emotional well-being (happy, interested in life, satisfied), psychological well-being and social well-being.	n=**5** (Fledderus et al., 2010; Fledderus et al., 2012; Pots et al., 2016; Räsänen et al., 2016; Trompetter et al., 2014)
Psychological Well-being (PWB)	Six domains: autonomy, environmental mastery, personal growth, positive relationships, purpose in life, self-acceptance	n=**2** (Azkhosh et al., 2016; Bayati et al., 2017)
Satisfaction with Life Scale (SWLS)	Uni-dimensional. Five items: designed to measure global cognitive judgments of one's life satisfaction	n=**2** (Lundgren et al., 2008 Thorsell et Al., 2011)
Well-Being Manifestations Measure Scale (WBMMS)	The six factors or subscales of the WBMMS are: control Meaning in Life and Psychological Well-Being of self and events, happiness, social involvement, self-esteem, mental balance, and sociability	n=**1** (Gregorie et al., 2018)
Warwick and Edinburgh Mental Well-being Scale (WEMWBS)	Uni-dimensional. 14 items: designed to measure subjective wellbeing and psychological functioning	n=**1** (Majumdar & Morris, 2018)

Additional Outcome Measures

Table 3 illustrates the range of additional measures (n=24) administered in each of the included studies. The diversity in these measures reflects the heterogeneity of targeted sample populations/characteristics included in the review. The most frequently used measures alongside SWB measures included ACT-related process measures such as psychological flexibility measures (e.g. the Acceptance and Action Questionnaire; AAQ; Bond et al., 2011) and measures of clinical symptoms such as anxiety or depression (e.g. Hospital Anxiety and Depression Scale; HADS; Zigmond & Snaith, 1983).

Study findings and efficacy of interventions

When considering the findings and efficacy of the included studies, the different formats in which they were delivered should be considered. In all five studies that delivered group-based interventions significant, medium-large effect sizes favouring ACT (in comparison to non-active controls, and one NA group) were found for wellbeing outcomes at post-intervention assessment (T1) (Azkhosh et al., 2016; Bayati et al., 2017; Fledderus et al., 2010; Gregorie et al., 2018; Majumdar & Morris, 2018). Two of these studies included a FUP (T2) one in which gains were maintained at 20 weeks (Fledderus et al., 2010) and one in which gains were not maintained (Majumdar & Morris, 2018) at 8 weeks.

One study reported a mixed intervention, in which participants attended both individual and group sessions (Lundgren et al., 2008). In this study a significant, medium effect size favouring Yoga (in comparison to ACT) was reported (d=0.58). It is important to note that this study calculated its reported effect sizes using the mean of all post-measure points (T2-3; post-intervention, 24 week FUP; 52 week FUP). Of the three studies that reported guided, online interventions two studies reported significant, small effects favouring ACT for wellbeing outcomes (compared with WLCs, and EW Group). At FUPs (T2-3; 26-52 weeks) these effects were maintained (Pots et al., 2016; Rasanen et al., 2016). The other guided, online study reported no significant differences in wellbeing outcomes between ACT, EW group and WLC post-intervention (Trompetter et al., 2014).

The two remaining studies reported results of guided, interventions with the provision of self-help books and email/individual support (Fledderus et al., 2012; Thorsell et al., 2011). Both reported medium-large effect sizes favouring ACT for wellbeing outcomes post-intervention (in comparison to WLC, and an AR group). No significant differences were found between two types of ACT delivery methods: minimal versus extensive support (Fledderus et al., 2012). In these two studies, gains were maintained at FUP (20-26 weeks).

Table 2: Demographic Details of Participants in the Included Studies

		Demographics			Sample Characteristics	
Study	**Country**	**Sample Size**	**Age (Mean, SD/range)**	**Gender (% male)**	**Population**	**Clinical or Non-Clinical/ Recruitment**
Azkhosh et al, 2016	Iran	60	27.5 (n/s)	(n/s)	Individuals with an addiction to opiates, no symptoms of psychosis	Clinical sample, recruited from drug rehabilitation centres
Bayati et al, 2017	Iran	30	n/s (18-55)	0	Females with a diagnosis of multiple-sclerosis, no other physical, or mental health diagnosis	Clinical sample, recruited from the Kermanshah MS Society
Fledderus et al, 2010	Netherlands	93	49 (24-71)	18.3	Individuals with mild to moderate distress	Clinical sample, recruited from mental health institutions
Fledderus et al, 2012	Netherlands	376	42 (18-73)	30	Individuals with mild to moderate depressive symptomology	Non-clinical sample, recruited from the general population
Grégoire et al, 2018	Canada	144	31.7 (SD: 9.22)	26.4	Undergraduate and postgraduate university students	Non-clinical sample, recruited from four participating universities
Lundgren et al, 2008	India	18	23.5 (18-55)	66	Individuals with an epilepsy diagnosis with drug refractory seizures	Clinical sample, recruited from clinics
Majumdar et al, 2018	England	53	62.7 (SD:13.9)	32	Individuals who had experienced a stroke, no degenerative, ABI or cognitive difficulties	Clinical sample, recruited from stroke clinics
Pots et al, 2016	Netherlands	236	46.8 (SD:12.06)	24	Individuals with mild to moderate depressive symptomology	Non-clinical sample, recruited from the general population
Räsänen et al, 2016	Finland	68	24.3 (19-32)	14.7	University students with self-reported distress (stress, low mood and/or anxiety)	Non-clinical sample, recruited from participating university
Thorsell et al, 2011	Sweden	90	46 (12.3)	35.6	Individuals experiencing chronic pain	Clinical sample, Specialty Pain Clinic
Trompetter et al 2014	Netherlands	238	52.7 (n/s)	24.6	Individuals experiencing chronic pain	Non-clinical sample, recruited from the general population

Table 3: Summary of Included Studies

Study	Intervention/s		Control	Intervention Duration/ number of sessions	Wellbeing measure	Other measures	Attrition Rates %		Findings
	Format	Content/ Delivery (therapists)					Intervention Arm/s	Control Arm	(Reported Effect Sizes)*
Azkhosh et al, 2016	Group	1) Acceptance and Commitment group (ACT; n=20); content n/s; **Delivered by**: the author (1 group). 2) Narcotics Anonymous group (NA; n=20). Contentn/s **Delivered by**: n/s (1 group)	Treatment as usual (TAU)=methadone treatment n=20	1) ACT group=12 weekly x 1.5 hours 2) NA group= n/s	**PWB** Completed at: Baseline (T0) 12 weeks (T1) 18 weeks (T2)	AAQ-II	1) ACT group T0-T1=20% T0-T2=n/s 2) NA group T0-T1=15% T0-T2=n/s	TAU group T0-T1=0% T0-T2=n/s	From T0-T1 ACT group showed significantly greater gains in well-being relative to the NA and control group(PWB; Ƞ2= 0.24)
Bayati et al, 2017	Group	ACT group for living with pain (n=15) based on unpublished manual. Sessions covering: limits of control; values; cognitive defusion; committed action; review; moving forward. **Delivered by**: n/s	Control, No inter-vention offered n=15	ACT group= 9 weekly x 1.5 hour sessions	**PWB** Completed at: Baseline (T0) 9 weeks (T1)	N/A	ACT group T0-T1=n/s	Control T0-T1=n/s	From T0-T1 ACT group showed greater gains in wellbeing relative to the control group on well-being (PWB)was significant (Ƞ2=0.41)
Fledderus et al 2010	Group	ACT group "living to the full" (n=49) based on manual. Sessions covering: acceptance; cognitive defusion; contact with present moment; self-as-context; values; mindfulness. **Delivered by**: teams of 2 licensed psychologists (7 sites)	Waiting list control (WLC) n=44	ACT group=8 weekly x 2 hour sessions	**MHC-SF** Completed at: Baseline (T0) 8 weeks (T1) 20 weeks (T2)	AAQ-II	ACT group T0-T1=20% T0-T2= no further attrition (20%)	WLC group T0-T1=4% T0-T2=7%	From T0-T1, and T1-T2 those receiving ACT showed significantly greater gains in well-being (MHC-SF; T1-T0 *d* = 0.56; T1-T2 *d* = 0.85) to

Note: n/s=not specified; *d*=Cohen's d; Ƞ2= eta squared. CI= confidence interval

Study	Intervention/s		Control	Intervention Duration/ number of sessions	Wellbeing measure	Other measures	Attrition Rates %		Findings (Reported Effect Sizes)
	Format	Content/ Delivery (therapists)					Intervention Arm/s	Control Arm	
Gregorie et al, 2018	Group	ACT groups "KORSA" based on manual (n=72). Sessions covering: values; committed action; acceptance; cognitive defusion; mediation; mindfulness. Mediation and observation grid homeworks. **Delivered by**: two doctoral-level psychology students (4 sites)	Waiting list control (WLC) n=72	ACT group= 4 weekly x 2.5 hours	**WBMMS** Completed at: Baseline (T0) 4 weeks (T1)	PSM-9 GAD-7 PHQ-9 AES FFMQ MEAQ	ACT group T0-T1=20%	WLC group T0-T1=42%	From T0-T1 those receiving ACT showed significantly greater gains in well-being (WBMMS; *d* = 0.61) compared to WLC
Majumdar & Morris, 2018	Group	ACT groups "ACTivate Your Life after Stroke" (n=26) based on manual. Sessions covering: didactic presentations including ACT activities. **Delivered by**: clinical and assistant psychologists and care co-coordinators (3 sites)	Treatment as usual (TAU) N=27	ACT group=4 weekly x 2 hour sessions	**WEMWBS** Completed at: Baseline(T0) 4 weeks (T1) 8 weeks (T2)	PHQ-9 GAD-7 EQ5D5L AHS	ACT group T0-T1=4% T0-T2=15%	TAU group T0-T1=15% T0-T2=8%	From T0-T1 those receiving ACT showed significantly greater gains in well-being (WEMWBS; η2 = 0.07) when compared to TAU. At T2 FUP effects were <u>not</u> maintained
Lundgren et al 2008	Mixed (group and individual)	1) ACT group/ individual sessions for epilepsy (n=10) based on published manual, 'adapted for Indian context'. Sessions covering: values; self-as-context; defusion; acceptance; committed action.ABC homeworks . **Delivered by:** two clinical psychologists 2) Yoga group/ individual sessions for epilepsy (n=8) based on a manual. Sessions covering: stimulating activity in directions the participants considered meaningful and using yoga technique to decrease the risk of seizures. **Delivered by:** yoga teacher at the clinic	N/A	ACT and Yoga groups=5 weekly sessions: 1 x initial individual session (1.5 hours) 2 x group sessions (3 hours)1 x final individual session (1.5 hours) . 2 x booster sessions at 6 and 12 months (1.5 hours)	**SWLS** Completed at: Baseline (T0) 5 weeks (T1) 26 weeks (T2) 52 weeks (T3)	WHO-QOL BREF	1) ACT group T0-T1=0% T1-T2=0% T3-14=0% 2) Yoga group T0-T1=0% T1-T2=0% T3-T4=0%	N/A	From T0-T4 (effect sizes were calculated using the mean of all post measure points) those receiving Yoga group showed significantly greater gains in well-being (WEMWBS; *d* = 0.58) compared to ACT group

Note: n/s=not specified; *d*=Cohen's d; η2= eta squared. CI= confidence interval

Study	Intervention/s		Control	Intervion Duration/ number of sessions	Wellbeing measure	Other measures	Attrition Rates %		Findings (Reported Effect Sizes)
	Format	Content/ Delivery (therapists)					Intervention Arm/s	Control Arm	
Pots et al 2016	Online guided self-help	1) ACT online intervention (n=82) "Living to the full" based on published self-help intervention. Nine online modules covering: cognitive defusion; acceptance; mindfulness; self-as-context; values; committed action. Mindfulness homeworks. 2) Expressive writing (EW) intervention (n=67) based on published text. 9 online modules covering: EW regarding negative experiences; reflection emotional regulation, reappraisal of emotions); EW of positive experiences. EW homeworks. **Both delivered by:** 5 psychology students provided email support	Waiting list control (WLC) n=87	ACT and EW group= 9 modules to be completed over 12 weeks Weekly, personalized, email support and standardized text message	**MHC-SF** Baseline (T0) 12 weeks (T1) 26 weeks (T2) ACT and EW only = 52 weeks (T3)	CES-D, MINI, SDS, HADs, FFMQ-SF AAQ-II	1) ACT group T0-T1=13% T0-T2=11% T0-14=13% 2) EW group T0-T1=25% T0-T2=21% T0-T3=30%	Control group T0-T1=10% T0-T2=9% T0-T3=N/A	From T0-T1 and at T2 those receiving ACT intervention showed significantly greater gains in wellbeing when compared to EW and WLC groups. At T1 (MHC-SF; ACT vs EW *d=0.35*, ACT vs WLC *d=0.39*). At T2 FUP (MHC-SF; ACT vs EW *d=0.35*, ACT vs WLC *d=0.39* ACT vs EW d=0.25, ACT vs WLC=*d*=0.22) At T3 FUP effects were maintained.
Rasanen et al, 2016	Online guided Self-help	ACT online intervention (n=33) "iACT". based on a published protocol and adapted for students based on published self-help intervention. Five modules covering: values; taking action; being present; observer self; awareness; acceptance. Homeworks (e.g. practicing skills and wellbeing tasks). **Delivered by**: 22 ACT-trained psychology students (third year and above) did individual sessions and provided personalized online feedback	Waiting list control (WLC) n=35	ACT=5 modules completed over 7 weeks: 1 x initial individual session Completed 5 online modules 1 x final individual session Personalized, weekly online feedback, and reminder text/emails.	**MHC-SF** Completed at: Baseline (T0) 7 weeks (T1) ACT group only= 52 weeks (T2)	PSS-10 BDI-II, DASS-21, AAQ-11, FFMQ OLQ-13	ACT group T0-T1=12% T0-T2=22%	WLC group T0-T1=0% T1-T2=N/A	From T0-T1 those receiving ACT showed significantly greater gains in well-being (MHC-SF; *d* = 0.46) when compared to WLC At T2 FUP of those in the ACT condition, gains persisted

Note: n/s=not specified; *d*=Cohen's d; Ƞ2= eta squared. CI= confidence interval

Study	Intervention/s		Control	Intervention Duration/ number of sessions	Wellbeing measure	Other measures	Attrition Rates %		Findings (Reported Effect Sizes)
	Format	Content/ Delivery (therapists)					Intervention Arm/s	Control Arm	
Trompetter et al 2014	Online guided self-help	1) ACT online intervention (n=82) "Living with pain" based on published self-help programs. Nine online modules covering: cognitive defusion; acceptance; mindfulness; self-as-context; values; committed action. Mindfulness homeworks. 2) Expressive writing (EW) intervention (n=79) based on published text. 9 online modules covering: psycho-education about emotions and emotion regulation related to the pain experiences, followed by EW. **Both delivered by:** 5 psychology students provided email support	Waiting list control (WLC) n=77	ACT and EW group= 9 modules completed over 12 weeks Weekly, personalized, email support and standardized text messages	**MHC-SF** Baseline (T0) 12 weeks (T1) 26 weeks (T2)	MPI HADS PDI PIPS FFMQ-SF ELS	1) ACT group T0-T1=18% T0-T2=35% 2) EW group T0-T1=35% T0-T2=22%	Control group T0-T1=22% T0-T2=17%	T0-T2 those receiving ACT showed no significantly greater gains in well-being in comparison to WLC or EW.
Fledderus et al 2012	Guided Self-help	1) ACT extensive support intervention: participants received published self-help book "living to the full"with *extensive email support* (n=125). Nine online modules covering 6 core ACT processes. Mindfulness homeworks 2) ACT minimal support intervention: participants received published self-help book "living to the full"with *minimal email support* (n=125). Nine online modules covering core ACT processes. Mindfulness homeworks **Both delivered by:** 5 psychology students (emails, feedback).	Waiting list control (WLC) n=126	ACT extensive support and minimal support groups= 9 modules completed over 9 weeks ACT extensive support=weekly emails personalized feedback/ advice through emails and text. ACT minimal support=weekly standardized emails and positive encouragement	**MHC-SF** Completed at: Baseline (T0) 9 weeks (T1) ACT groups (T2) only= 20 weeks	CED-S, HADS, AAQ, FFMQ, CIS	ACT extensive support group T0-T1=15% T0-T2=21% ACT minimal support group T0-T1=11% T0-T2=16%	WLC group T0-T1=0% T0-T2=N/A	From T0-T1 those receiving ACT extensive and minimal support showed significantly greater gains in well-being compared to WLC (MHC-SF; ranging from *d* = 0.51-0.79). No significant differences in wellbeing between the two ACT conditions. At T2 FUP ACT groups maintained effects

Study	Intervention/s		Control	Intervention Duration/ number of sessions	Wellbeing measure	Other measures	Attrition Rates %		Findings (Reported Effect Sizes)
	Format	Content/ Delivery (therapists)					Intervention Arm/s	Control Arm	
Thorsell et al 2011	Guided self-help	1) ACT intervention: participants received published self-help book "living beyond your pain" (n=61) covering ACT processes: values; committed action; mindfulness; cognitive defusion; acceptance; avoidance 2) Applied relaxation: participants received self-help manual (N=54) covering progressive, cued, differential and rapid relaxation **Both delivered by:** 8 psychology interns	N/A	ACT and AR groups= 8 sessions over 7 weeks 1 x initial individual session (1.5 hours) 6 x telephone sessions 1 x final individual session (1.5 hours) Email support as needed	**SWLS** Baseline (T0) 7 weeks (T1) 26 weeks (T2) 52 weeks (T3)	HADS OMP-OQ CPAQ	1) ACT group T0-T1=46% T0-T2=56% T2-T3=73% 2) AR group T0-T1=50% T0-T2=52% T0-T3=73%	N/A	From T0-T1 those receiving ACT intervention showed significantly more improvement in wellbeing, than the AR group (SWLS; *d*=0.75. This was maintained at T2 FUP SWLS; *d*=0.3895% (CI), and at T3 FUP SWLS; *d*=0.54

Wellbeing measures: MHC-SF: Mental Health Continuum- Short Form, PWB: Ryffs Psychological Wellbeing Scale, SWLS: Satisfaction with Life Scale, WBMMS: Well-Being Manifestations Measure Scale, WEMWBS: Warwick and Edinburgh Mental Well-being Scale,. **Other Measures:** AAQ-II: Acceptance and Action Questionnaire, AES: Academic Engagement Scale: AHS: Adult hope scale: BDI-II: Beck Depression Inventory CED-S: Center for Epidemiologic Studies Depression Scale: CPAQ: Chronic Pain Acceptance Questionnaire, CIS: Checklist Individual Strength, DASS-21: Depression, Anxiety, Stress Scale, ELS: Engaged Living Scale, EQ5D5L: EuroQol five-dimensional questionnaire, FFMQ/-SF: Five Facet Mindfulness Questionnaire/short-form, HADS, Hospital Anxiety and Depression Scale, MEAQ: Multidimensional Experiential Avoidance Questionnaire, MINI: Mini International Neuropsychiatric Interview, MPI: Multidimensional Pain Inventory, OLQ-13: Orientation to Life Questionnaire; OMPQ: Orebro Musculoskeletal Pain Questionnaire, PCS: Pain Catastrophizing Scale, PDI: Pain Disability Index, PIPS: Psychological Inflexibility in Pain Scale, PHQ-9: Patient Health Questionnaire-9, PSS-10: Perceived Stress Scale, SDS: Sheehan Disability Scale , WHO-QOL-BREF: World Health Organization Quality of Life Instrument- Short Version.

Effect sizes: *d*= Cohen's d. (*d*= 0.2 is considered as a small effect; d=0.5 as medium; and d=0.8 as large) (Cohen, 1992).Ƞ2= eta squared (Ƞ2= 0.01 is considered a small effect, Ƞ2= 0.06 is considered a medium effect, Ƞ2=0.14 is considered a large effect) (Cohen and Miles & Shevlin (2001)

Discussion

The aim of the current review was to synthesise and critically appraise the research findings of RCTs of ACT interventions that assessed SWB. The review sought to evaluate the methodological rigor of these RCTs, the ranges of assessment measures used, and the reported levels of efficacy of ACT in bringing about changes in SWB. Eleven studies were identified as meeting criteria for inclusion.

Methodological quality and rigor

The Cochrane Risk of Bias Tool was utilised to assess risk of bias (Higgins & Green, 2011). The methodological quality of the included studies was variable. In one domain 'blinding of participants/ personnel', a high risk of performance bias was found across all the included studies. This represents an important limitation of therapy research in general, and is not specific to ACT (Munder & Barth, 2018). With the exception of this category, two studies were considered 'low risk' across domains (Pots et al., 2016; Räsänen et al., 2016). These studies clearly documented procedures for sequence generation, handling incomplete data, and provided detailed descriptions of interventions. In contrast, two studies were deemed 'low risk' in less than two domains, with the majority deemed 'high' or 'unclear risk' (Azhosh et al., 2016; Bayati et al., 2017). These studies provided insufficient information on key aspects of the research designs and interventions. Across all studies: 63% of domains were deemed 'low risk, 18% 'unclear risk', and 18%were deemed 'high risk' of bias. This review highlights the need for future researchers to improve clarity and transparency when reporting ACT trials.

Some important methodological difficulties highlighted in this review included inadequate reporting of allocation concealment, and insufficient reporting/ handling of attrition data. Procedures to protect allocation sequence (randomisation) are essential in RCTs (i.e. using external agencies to allocate participants), and such procedures need to be documented to ensure selection bias is not introduced. With regards to attrition, two studies provided

insufficient information relating to drop-outs or handling of missing data and a further two studies used simple imputation methods (last observation carried forward) which can lead to bias or misleading results. Of note, all studies in the included review were deemed low risk of selection bias as they reported all pre-specified outcomes (contained within the report). Future research should endeavour to publish and reference trial protocols as this was undertaken in only a minority of the included studies. This would facilitate a more detailed assessment of internal validity.

In order to overcome some of the inherent bias introduced in therapeutic research, in which neither participants nor personnel can remain blinded, an additional domain 'deviations from intended interventions' was considered (Higgins et al., 2016). This domain allowed the authors of this review to assess treatment implementation and integrity (i.e. therapist/ participant adherence, training) and treatment 'dosage'. Most of the studies were deemed 'low risk' of this type of performance bias. Where risk was deemed 'unclear', this judgement arose due to a failure to report participants' adherence to the interventions. In two studies no details of therapist training, treatment fidelity measures and/or participant adherence were provided (Azhosh et al., 2016; Bayati et al., 2017). Of those studies deemed low risk, the majority were manualised, and included details of therapist training and reported high levels of participant adherence (balanced across active groups).

Additional methodological issues highlighted in the included studies included small sample bias, and a lack of active comparators, resulting in a lack of control for non-specific therapeutic factors (n=6). Such limitations echo findings of previous systematic reviews of ACT RCTs (French et al., 2017; Hughes et al., 2017; Ost, 2014). Finally, whilst this review sought to appraise and synthesise published RCTs (often considered the 'gold standard' in evidence-based research), it must be acknowledged that this is likely to skew conclusions with regards to 'publication' biases.

Range of wellbeing measures utilised in included studies

A total of five different standardised measures of SWB were used in the included 11 studies. The most commonly used measure was the MHC-SF (Keyes, 2002) which was utilised in five studies, followed by the PWB scale used in two studies, and the SWLS (Diener et al., 1985) used in two studies. In a final two studies the WBMMS (Massé et al., 1998) and WEMWBS (Ruth at el., 2007) were utilised. This range of measures reflects a divergence in how SWB is conceptualised and operationalised within the wider research community (Cooke et al., 2016; Forgeard, Jayawickreme, Kern, & Seligman, 2011)

Whilst there was no general consensus as to how wellbeing should be measured in the included studies, the MHC-SF featured most prominently. This measure allows individuals to be classed as "flourishing" (highest level of wellbeing), "languishing" (lowest level of wellbeing) or "moderately mentally healthy" (neither "flourishing" nor "languishing") based on scores on individual indices of both hedonic and eudemonic aspects of the SWB construct (Keyes, 2002). Consistent with previous meta-analysis and reviews of ACT the majority of the research focused on symptom outcomes as a primary measure with only five studies specifying SWB outcomes as a primary outcome. As highlighted by previous authors, this represents a fundamental shortcoming in the literature base - symptom reductions are not the primary aim of ACT interventions.

Reported levels of efficacy for wellbeing outcomes

Whilst the high level of heterogeneity in the included studies (i.e. study population, outcomes and intervention format and delivery) precluded a meta-analysis, reported findings and effect sizes were considered within this review. In the current review, the most effective ACT interventions appeared to be those delivered in group formats, and those using self-help books with guidance (medium effect sizes in favour of ACT). Comparator groups in these studies included both non-active (i.e. WLC, TAU) and active controls (i.e. NA, AR). Online,

guided self-help ACT interventions appeared to be the least effective interventions in the current review (small effects in favour of ACT or no differences between all groups) as well as one mixed intervention (group and individual sessions) with a yoga group control (medium effect size in favour of yoga).

Notably, the majority of the studies in this review were published within the last two years, and were all group-based or guided self-help. This is likely to reflect the increasing use of SWB measures, and a rise in these formats for therapy that serve to increase access to therapies (Gellatly et al., 2007). Whilst caution must be exercised when making inferences from the findings of this narrative synthesis, previous meta-analysis of ACT interventions have concluded that "self-help formats are less efficacious than face-to-face interventions" (Ost, 2014), and that effect-size trends tend to favour book delivered self-help versus online (French et al., 2017) consistent with reported findings in the current review.

Whilst this review aimed to address a gap in the literature and explore ACT trials with a focus on SWB, during the preparation of this paper, another review was published exploring ACTs role in wellbeing promotion of undergraduate students specifically (Howell & Passmore, 2018). In their review, ACT interventions (of predominantly online format) were found to have small, positive effect on students' wellbeing (pooled effect size= *d*=.0.29)

Strengths and limitations of the current review

The scope of the current review included a wide variety of populations, and ACT formats (i.e. group, mixed, guided self-help; online or books) and outcome measures of SWB. As ACT is a transdiagnostic intervention, and is increasingly delivered in diverse formats this can be viewed as strength of the current review. Furthermore, the focus of this review on SWB as an outcome, is model-consistent (i.e. an outcome that ACT purports to target). However, the concomitant heterogeneity in the included studies prohibited meta-analysis, and limits the conclusions that can be drawn from the summary data reported in each study. Furthermore, it

is important to consider the high number of non-active controls which are likely to maximise the magnitude of reported effect sizes and do not account for non-specific factors.

The current review used a broad search strategy, and was inclusive of all studies incorporating standardized measures of SWB as listed, or against the criteria specified in a recent comprehensive review of SWB measures (Cooke et al., 2016). For the purpose of this review quality of life (a conceptually distinct, yet closely related term to SWB) was purposely excluded from search terms (Cooke et al., 2016; Pinto, Fumincelli, Mazzo,Caldeira, & Martins, 2017). It has been noted that these terms have been used inconsistently within the wider literature, yet it was evident within our searches that such confusion did not exist (i.e. authors appropriately terming quality of life measures 'quality of life'). The authors of this review did not consider additional outcomes reported in the included studies (i.e. depression, anxiety) and this may be viewed as a further limitation of the current review.

Implications of the current review and recommendations

There is an evident need for researchers within the ACT community to use more appropriate model-consistent outcomes such as SWB in future RCTs. Increasing the use of such measures (i.e. MHC-SF, SWLS, PWB) in large RCTs would allow for further meta-analysis of SWB outcomes (i.e. focused on specific formats of ACT, or measures). Given the vast number of available, standardised measures of SWB is it suggested that authors be explicit about their choice of measure, and underlying conceptualisation of SWB. The inclusion of active controls in these designs would further strengthen the evidence base of ACT, and control for non-specific therapeutic factors. Furthermore, in this review half of the studies included had a relatively short FUP, or did not include one. In future, studies with longer FUP are necessary to explore the long-term effects of ACT interventions on SWB.

The findings of this review also highlight the need for careful consideration, transparency and clarity when designing and reporting trials (e.g. procedures for allocation

concealment, reporting and handling of missing data). In this review, the addition of "deviations from intended interventions" a new RoB category (Higgins et al., 2016) allowed the authors to consider bias in relation to therapy integrity and adherence. It is suggested that future reviewers, and trial investigators utilise these criteria when conducting therapeutic research. There is scope for future research to explore the relationship between SWB and symptom/illness outcomes, given that the majority of published studies have included SWB measures alongside these measures (i.e. depression). Further studies may also wish to explore the active components of ACT interventions (i.e. processes such as cognitive defusion) in improving SWB.

The findings of this review and aforementioned literature indicate that there is an increasing recognition that SWB may be improved in both clinical and non-clinical populations using ACT interventions. Whilst much of the research to date in non-clinical populations has been conducted with students, these interventions may also be applied in a broader range of contexts (e.g. in workplaces) and with a broader range of populations (e.g. older adults) in order to promote and enhance positive mental health. There is now an increasing recognition that ACT may help to elevate the SWB of vulnerable groups (e.g. refugees and those experiencing humanitarian crisis). For example, the WHO has recently developed a 5 session group administrated, guided self-help ACT intervention which is currently being trialled in northern Uganda, with female refugees (Brown et al., 2018). In this ongoing, clustered RCT, SWB is a key outcome measure. Finally, the inclusion of booster sessions may help to improve longer-term outcomes and maintain positive outcomes in both research trials and when working clinically with different populations.

Conclusion

The current systematic review sought to synthesise and critically appraise the research findings of RCTs of ACT interventions that have assessed SWB. Whilst caution must be exercised when generalising the findings of this review, the included studies indicate that guided, ACT interventions may be beneficial in enhancing SWB in clinical and non-clinical populations. Future RCTs that include standardised measures of SWB are necessary to facilitate further meta-analysis. The methodological limitations highlighted in this review indicate the need for further high-quality studies, with larger sample sizes and active comparators. It is hoped that these recommendations will facilitate an improved understanding of the role of ACT in supporting and enhancing wellbeing, and mental health.

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Chapter 2:"Exploring Acceptance and Commitment Processes as Predictors of Subjective Wellbeing in Student Practitioners"

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Abstract

Background: Medical, other healthcare and veterinary students collectively referred to here as student practitioners (SPs) represent a sub-group of students who frequently report high levels of psychological distress, as well as decreased levels of wellbeing during training. The current study aimed to explore factors, and potential mediating processes (i.e. psychological inflexibility) that may predict subjective wellbeing (SWB) and distress in SPs.

Method: A total of 274 SPs studying the following degree courses at a UK University took part in the study: medicine, physiotherapy, nursing, veterinary sciences, occupational therapy, physiotherapy, orthoptics, radiotherapy, radiography, dentistry and clinical psychology. A cross-sectional design was used. Participants completed a series of online, self-report questionnaires (measuring psychological inflexibility, valued living, self-criticism, maladaptive perfectionism, SWB and distress).

Results: Four out of every ten SPs who participated in the study met caseness for psychological distress (GHQ-12), and less than half the sample reported experiencing the highest level of SWB ('flourishing'). Psychological inflexibility (AAQ-II) was found to be the strongest predictor of levels of subjective wellbeing, followed by valued living-*composite* (VLcom). Psychological flexibility was found to mediate the relationship between maladaptive perfectionism and SWB.

Conclusions: The findings of this study lend support for further exploration of contextual behavioural science approaches (e.g. Acceptance and Commitment Therapy) as a potential framework for helping to improve SWB and reduce distress in SPs. Further research is merited in order to explore the utility of these approaches, and how they might be best integrated into university curricula.

Key words: Acceptance and Commitment Therapy; Values-based Action; Subjective Wellbeing; Psychological Flexibility; Student Practitioners.

Introduction

Over the last decade, the proportion of UK undergraduate students disclosing mental health problems (MHP) has risen exponentially. Recently, the *Higher Education Statistics Agency* published figures indicating that, in last year alone, 15,395 first year students formally disclosed a MHP; representing a five-fold increase from 2006 (Institute for Public Policy Research, 2017). Whilst providing a useful indicator of current trends with higher education institutes (HEIs), these figures are likely to significantly under represent the overall incidence of MHP in this population (Unite, 2017). Furthermore, it is well documented that elevated levels of self-reported distress exist. For example, YouGov (2017) recently found that 63% of students surveyed experienced levels of stress which impacted on their daily life, with 77% reporting fear of academic failure. Evidently, university represents a crucial transitional stage into adulthood, in which academic underachievement can significantly impact on the course of an individual's life (Royal College of Psychiatrists, 2011).

In response to the rising prevalence of MHP, and an emerging narrative of 'crisis on campus*'* in which demand for psychological services is outstripping previous years, improving the mental health of students is now a 'strategic imperative' for higher education institutions (HEIs) (University UK Framework, 2017, pp.1). In 2018, the UK government emphasised the need for universities to actively promote and improve the wellbeing of students, as well as responding to MHP (Student Minds, 2018). As part of this call to action, a 'mental health charter' has recently been established to recognise HEIs with exceptional approaches in supporting and enhancing the mental health and wellbeing of students. It is envisaged that such measures will be embedded into a UK wide mental health strategy, encouraging universities to take 'a whole university' approach to wellbeing, reconfiguring themselves as health promoting environments (Student Minds, 2018).

Medical, other healthcare (e.g. dentistry, physiotherapy, nursing) and veterinary students collectively referred to here as student practitioners (SPs) represent a sub-group of students working towards professional healthcare qualifications. Research has demonstrated that SPs frequently report high levels of distress as well as lowered levels of psychological wellbeing during training (e.g. Chernomas & Shapiro, 2013; Dyrbye et al., 2006; Hunt & Gable, 2013; Ying, 2008). Common stressors cited within the literature associated with these programs include: frequent rotations between new working environments (Alzayyat & Al-Gamal, 2014; Dyrbye, Thomas, & Shanafelt, 2005); high workloads, unremitting examinations; reduced opportunities for extracurricular activities (Radcliffe & Lester, 2003; Tully, 2004); regular encounters with serious illness and the death of others (Mahajan, 2010); fear of making clinical mistakes and academic failure (Tully, 2004).

Rising levels of attrition amongst SPs (Griffiths & Corke, 2017) and the associated cost to the UK economy is of major concern against a backdrop of public sector cuts and austerity measures. For example, the average cost of medical training stands at £245,000 (Personal Social Services Research Unit, 2018). It has been reported that over 1,600 students across the UK have dropped out of medical courses in the last five years alone, many due to mental health related issues (Griffiths & Corke, 2017). Ensuring that the next generation of professionals are able to maintain their own mental health, continue training, and practice safely, remains an important priority for HEIs and the NHS (Royal College of Psychiatrists, 2011). In view of the evidence that SPs experience high levels of stress, the potential impact on professional functioning and in terms of the economic and social costs, the importance of developing appropriate interventions aimed at enhancing wellbeing is evident.

Recent years have witnessed a rapid growth in 'third wave' psychotherapies such as mindfulness based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT), and an increasing recognition that such inventions may not only benefit service-users,

but also healthcare practitioners. Mindfulness-based interventions aim to bring into awareness a breadth of aspects of life through "paying attention on purpose, in the present moment, and non-judgmentally to the unfolding experience moment by moment" (Kabat-Zinn, 2003, pp.143). A recent meta-analysis by McConville, McConville, and Hayne (2017) concluded that mindfulness-based interventions reduce stress, anxiety, and depression and lead to improved self-efficacy, and empathy in SPs. Yet as many authors have highlighted (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Van der Gucht, Takano, Raes, & Kuppens, 2018; White, Larkin, McCluskey, Lloyd, & McLeod, *in press*) the core, underlying change processes of such interventions remain poorly demarcated and under-researched.

Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999) is a 'third wave' psychotherapy underpinned by functional contextualism, which views psychological suffering as caused by psychological inflexibility. Psychological inflexibility, may be characterised by *cognitive fusion* ("excessive attachment to the literal content of thoughts"), *experiential avoidance* ("attempts to alter the form or frequency of painful internal events"), and behaviour that is inconsistent with what people subjectively value (Hayes, Levin, Plumb-Vilardaga & Pistorello, 2013, pp. 5). From its foundations, proponents of ACT have sought to identify and understand its mechanisms of action. As Hayes et al. (2006) highlighted, researchers have focused efforts on developing a basic account of such processes for well over a decade.

Psychological inflexibility, most commonly assessed using the *Acceptance and Action Questionnaire* (AAQ-II; Bond et al., 2011), is theorised to be the central process of change in ACT, encompassing several subcomponents (e.g. acceptance, values, cognitive defusion). Such a focus distinguishes ACT from other mindfulness-based interventions, in which it has been acknowledged that there is a relative scarcity of literature addressing specific mechanisms of change (Fjorback, Arendt, Ørnbøl, Fink, & Walach, 2011).

ACT aims to enhance psychological flexibility, defined as "the ability to be in the present moment with full awareness and openness to experiences and to take guided action towards personally held values" (Harris, 2009, pp. 12). Utilising strategies such as acceptance (embracing internal experiences without altering their form or frequency), cognitive defusion (achieving psychological distance from internal experiences), together with behavioural change techniques, ACT endeavours to help individuals to engage in values-based living. From an ACT perspective, values are characterised as being "freely chosen verbally constructed and personally meaningful life directions" (Harris, 2009, pp.38). Whilst there has been a paucity of literature relating to the appropriateness and effectiveness of ACT in relation to SPs, previous studies have demonstrated that psychological constructs relevant to ACT are related to increased subjective wellbeing (SWB) in clinical and non-clinical samples (e.g. Bohlmeijer, Lamers, & Fledderus, 2015).

Most commonly measured within ACT using the Valued Living Questionnaire (VLQ) (Wilson, Sandoz, Kitchens, & Roberts, 2010), valued living (*see* above) may be broken down into two sub-categories: the importance an individual places on a number of different valued living life domains, and how consistently an individual acts in accordance with each of these values (Appendix H). It is reasonable to hypothesise, based on previous research with other non-clinical populations (e.g. Slezackova, Cefai, Cejkova, & Gassmann, 2018) that SWB will be significantly associated with the degree to which SPs engage in valued living (and its constituent parts: importance and consistency).

By virtue of the high academic and professional standards that SPs are required to meet, and the attention to detail required in health care professions, the concept of *perfectionism* is of particular relevance to SPs. Perfectionism has been commonly defined by meet these standards (Burns, 1980: Flett & Hewitt, 2002; Frost, Marten, Lahart, & Rosenblate, 1990). High levels of perfectionism have been noted in SPs as well as practicing health care

professionals (Enns, Cox, Sareen, & Freeman, 2001; Myers & Gabbard, 2006). Furthermore, higher levels of 'maladaptive' perfectionism has been associated with poor adjustment, and high levels of psychological distress, depression and hopelessness in students studying medicine, dentistry, pharmacy and nursing (Henning, Ey, & Shaw, 1998; Enns et al., 2001). More recently, Stoeber & Corr (2016) in a study conducted with students, concluded that high levels of maladaptive perfectionism "undermined flourishing and stood in the way of emotional, psychological, and social well-being" (Stoeber & Corr, 2016; pp. 7).

There exist varying definitions and conceptualisations of perfectionism within the research and clinical literature. For example, Shafran, Cooper and Fairburn (2002) proposed a clinical definition of perfectionism defined as "'the overdependence of self-evaluation on the determined pursuit of personally demanding, self-imposed standards in at least one highly salient domain, despite adverse consequences' (p. 778). Subsequently, the authors developed a 12-item Clinical Perfectionism Questionnaire (CPQ) based on their uni-dimensional conceptualisation of perfectionism (Fairburn et al., 2002). However, this questionnaire has faced criticism within the research literature, as several studies have revealed a two factor (multi-dimensional) structure in clinical and community samples when examining the CPQ (e.g. Dickie, Surgenor, Wilson, & McDowall, 2012; Egan et al., 2016; Stoeber & Damian, 2014).

There is currently wide-spread consensus that perfectionism is a multidimensional construct (*see* Hewitt & Flett, 2004; Stoeber & Otto, 2006; Stairs, Smith, Zapolski, Combs, & Settles, 2012). Frost and colleagues (1990) proposed the following components to their multi-dimensional operationalization of perfectionism: 1) "high personal standards", 2) "organisation" i.e. emphasis on orderliness, 3) "concerns over making mistakes", 3) "parental expectations", 4) "parental criticism", and 5) "doubts over one's performance" (p.454). Frost, Heimberg, Holt, Mattia and Neubauer (1993) later performed a factor analysis of their

perfectionism measure that revealed two factors "positive striving" and "maladaptive concerns", which correlated with affect outcomes. The former ("positive striving") was linked with positive affect (comprising of standards and organisation), and the latter dimension ("maladaptive concerns") was associated with negative affect (comprising of concerns over mistakes, parental expectations and criticism, and doubts over actions). Both of these forms of perfectionism align closely with an earlier theoretical understanding of perfectionism outlined by Hamachek (1978) who distinguished maladaptive perfectionism (as opposed to 'normal' perfectionism) as being characterised by an intense fear of failure, overconcern for making mistakes, doubts over one's performance and a tendency for negative self-evaluations (underlying feelings of not being good enough).

More recently, it has been acknowledged within the literature that two sub-scales of the Frost Multidimensional Perfectionism Scale (FMPS) concerning self-evaluation: "concerns over making mistakes" (CM) and "doubts about actions" (DoA) represent the core facets of maladaptive perfectionism (Burgess, Frost & Di Bartolo, 2016; Dunn, Whelton & Sharpe, 2006).

In a study conducted with a student sample, Santanello & Gardner (2007) found that psychological flexibility partially mediated the relationship between maladaptive perfectionism and worry. Furthermore, research has demonstrated that avoidant coping (which may be akin to psychological inflexibility) mediates the relationship between maladaptive perfectionism and symptoms of depression (e.g. Dunkley, Blankstein, Halsall, Williams, & Winkworth, 2000). Recent research indicates that improved psychological flexibility is positively correlated with increased SWB (e.g. Wersebe, Lieb, Meyer, Hofer, & Gloster, 2018). In addition, maladaptive perfectionism has been linked to psychological inflexibility and lower levels of SWB (Crosby, Bates, & Twohig, 2010; Stoeber & Corr, 2016). However, to date, no research studies have explored these three constructs (i.e. maladaptive perfectionism,

psychological flexibility and SWB) together. Mediation analysis will therefore enable the authors to explore the hypothesised mediating role of psychological flexibility in the relationship between these two variables (maladaptive perfectionism, SWB).

Increased levels of psychological flexibility may provide SPs with opportunities to become aware of cognitions relating to maladaptive perfectionism without become entangled with them and reacting to them (cognitive fusion). This may improve overall wellbeing, and afford greater opportunities to behave consistently with a range of valued life domains (e.g. self-care) rather than focusing more narrowly on solely academic or professional achievement. For this reason, exploring these constructs in an SP population using correlational, and mediation analysis would be helpful in understanding these potential mechanisms of change to inform future intervention studies.

A related, yet distinct construct to perfectionism is self-criticism. Self-criticism has been defined as a "habitual pattern of self-blame, signified by a sense of falling short of one's own standards and an extreme focus on achievement" (Blatt, D'Afflitti, & Quinlan, 1976, pp. 385). Self-criticism has previously been linked with higher levels of perfectionism (Kannan & Levitt, 2013; Sherry & Hall, 2009) and psychological distress (Sherry & Hall, 2009; Zuroff, Sadikaj, Kelly, & Leybmann, 2016) in clinical and non-clinical samples. Similar to maladaptive perfectionism, self-criticism is a transdiagnostic process ubiquitous to many psychological difficulties, which has been associated with poorer mental health outcomes (e.g. depression and distress) in SPs (Brewin & Firth-Cozens, 1997; Tyssen & Vaglum, 2002).

A new measure, the *Flexibility of Responding to Self-Critical Thoughts* (FoReST; White et al., *in press*) has recently been developed to assess psychological flexibility specifically in relation to self-critical thoughts. It has been demonstrated that this measure has good validity and internal consistency (White et al., *in press*). To date associations that may exist between the FoReST and perfectionism have not been assessed.

The proposed research aims to explore factors and mediating processes (i.e. maladaptive perfectionism, self-criticism, psychological flexibility) that may predict SWB (defined here as the presence of positive affect, psychological and social wellbeing; Keyes, 2002) and distress experienced by SPs. To date, much of the research within the psychotherapy literature, and in SP populations has focused on the presence or absence of MHP and/or distress; with the implicit assumption being that ameliorating MHP is sufficient to improve SWB. However, there is increasing evidence to suggest that SWB exists on a distinct, yet correlated dimension to psychological distress and "illness" (e.g. Keyes, 2005; Westerhof & Keyes, 2010; Keyes, Wissing, Potegieter, Temane, Kruger, & Van Rooy, 008).

'This '*dual-factor model*' of mental health postulates that mental illness and SWB sit on different continuums that sit orthogonal to each other. 'Flourishing' (the highest level of SWB) and 'languishing' (the lowest level of SWB) are proposed to lie at opposite ends of the SWB spectrum (Keyes, 2002). Thus, that a lack of MHP/or psychological distress does not necessarily equate to SWB, and that experiencing MHP/or psychological distress does not preclude SWB.

In a wide range of populations, increased SWB has been associated with increased longevity; improved cognitive and immune system functioning; enhanced productivity/professionalism; and has been demonstrated to 'buffer' against future physical and mental health issues, and attenuate the effects of psychological distress (Dyrbye et al., 2012; Howell, Kern, & Lyubomirsky, 2007; Lamers, Bolier, Westerhof, Smith, & Bohlmeijer, 2012; Lamers, Westerhof, Glas, & Bohlmeijer, 2015; Wright & Cropanzano, 2000).

In exploring the aforementioned processes, and how they relate to SWB and distress in SPs the current study aims to take an important step towards helping HEIs to: devise mental health promotion and/or preventative interventions that can be embedded into university curricula to enhance students' health and wellbeing, better support students at risk of

psychological morbidity, and to potentially reduce the number of university dropouts by SPs related to MHP (University UK, 2017).

Aims

A) Assess the SWB of current SPs, and explore the relationship between SWB and psychological distress of SPs.

B) Investigate how much variance in SWB is predicted by ACT-related processes of change (i.e. psychological flexibility, value consistent behaviour), maladaptive perfectionism and self-critical thinking.

C) Explore the relationship between maladaptive perfectionism and subjective wellbeing, and the potential mediating roles of ACT-related processes of change in this relationship.

D) Provide preliminary empirical research into the potential utility of ACT as an intervention for enhancing student practitioner's SWB.

Hypotheses

A.1. Lower levels of SWB (MHC-SF)[2] will be significantly associated with higher levels of psychological inflexibility (AAQ-II/FoReST)[3], a lower number of highly important life domains (VLi), and a lower number of life domains in which behaviour was rated as highly value consistent (VLc)[4].

A.2. Lower levels of SWB (MHC-SF) will be significantly associated with higher levels of maladaptive perfectionism (FMPS)[5], and higher levels of distress (GHQ-12)[6].

B. Higher levels of maladaptive perfectionism (FMPS) and self-critical thoughts (FSCRS) will be significantly associated with higher levels of psychological inflexibility (AAQ-II/FoReST), a lower number of highly important life domains (VLi), and lower number of life domains in which behaviour was rated as highly value consistent (VLc).

C. A substantial proportion of variance in SWB will be accounted for by the following variables: maladaptive perfectionism (FMPS), self-critical thoughts (FSCRS), psychological inflexibility (AAQ-II); and valued living-*composite* measure (VLcom).

D. The relationship between maladaptive perfectionism (FMPS) and lower levels of SWB (MHC-SF) will be mediated by psychological inflexibility (AAQ-II/FoReST).

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Method

Participants

Two hundred and seventy four student practitioners (222 females and 52 males) completed the study between April 2018 and August 2018. To be eligible to take part in the current study, participants had to be registered at the University of Liverpool as a student studying one of the following undergraduate or postgraduate degree courses: medicine, physiotherapy, nursing, veterinary sciences, occupational therapy, physiotherapy, orthoptics, radiotherapy, radiography, dentistry or clinical psychology (DClinPsyc); were willing and able to give informed consent, and able to read written English. An *a priori* sample size calculation based on the planned multiple regression analysis using the approach recommended by Green (1991), indicated that a minimum of 111 participants were required to detect expected medium effect sizes (with critical $\alpha <= .05$ and power of 80%).

Measures

Well-being: The *Mental Health Continuum – Short Form* (MHC-SF; Keyes, 2002) is a 14-item measure of SWB that measures three facets of subjective wellbeing: social, emotional, and psychological wellbeing (*see* Appendix G). Higher scores indicate positive mental health. It has previously demonstrated good internal reliability ($\alpha= 0.89$) and test-retest reliability (0.65; Lamers, Westerhof, Bohlmeijer, Klooster & Keyes 2011). This measure of SWB was selected as it measures both *hedonic* and *eudemonic* aspects of wellbeing, and is increasingly being used within ACT research facilitating comparisons between studies. As well as providing a total continuous score (range= 0-70), individuals can be categorised as "languishing", "moderately healthy" or "flourishing" based on criteria outlined by Keyes (2002). In the current study this questionnaire demonstrated excellent internal consistency ($\alpha=.94$).

Valued Based Action: The *Valued Living Questionnaire* (VLQ; Wilson, Sandoz, Kitchens, & Roberts, 2010) is a measure of individual's values and value-consistent behaviour (*see* Appendix H). Two subscales respectively measure: 1) the perceived importance of 10 domains of valued living (*importance*), and 2) the extent to which one is behaving consistently with how importantly they rated these values (*consistency*). In the current study, the measure demonstrated adequate internal consistency (α=.69, α=.76). This measure was utilised in the current study as it was designed to measure valued-based living, a key mechanism of change ACT purports to target. In the current study, an overall weighted valued living-*composite* score (VLcom) was calculated using both the *consistency* and *importance* subscale scores. This was calculated by multiplying *importance* and *consistency* scores and computing the mean values as specified by Wilson et al., (2010). Additionally, each subscale was also considered individually with the frequency in which participants rated domains as ≥ 5 on each subscale being calculated. On the valued living-*importance* subscale, a score of ≥5 was considered a "highly important" (VLi) life domain. On the valued living-*consistency* subscale a score of ≥5 was considered "highly value-consistent" (VLc) behaviour. This study was the first of its type to score the individual subscales in this way. This scoring allowed a more nuanced understanding of what participants were subjectively prioritising in terms of valued-based living, and was in line with the studies hypotheses (*see* Hypothesis section).

Distress: The *General Health Questionnaire 12* (GHQ-12; Goldberg et al., 1997) is a 12-item measure of psychological distress (*see* Appendix I). The measure has good levels of internal consistency (α=0.92), and of reliability (0.91) (Yaghubi, Karimi, Omidi, Barooti, & Abedi, 2012). This measure was selected as it is a commonly used measure of psychological distress. In the current study, this measure demonstrated excellent internal consistency (α=.94). In the current study total scores were calculated (range=0-36). Additionally, in order to establish clinical caseness scores, the Likert scale responses were transformed into binary

scores (GHQ-C scoring 0-0-1-1) as recommended by the authors. This provides a maximum total score of 12. A score of ≥ 4 is considered as meeting "caseness" (Guthrie, et al., 1998; James, Yates, & Fergunson, 2013).

Maladaptive perfectionism: The *Frost Multidimensional Perfectionism Scale* (FMPS; Frost et al., 1990) is a 35-item questionnaire designed to assess dimensions of perfectionism (*see* Appendix J). The scale has acceptable reliability and validity (Enns & Cox, 2002). This measure is a widely used, established measure of maladaptive perfectionism. The current study used total scores of two subscales; 'concerns of making mistakes' ('CM' α= .86) and doubts over one's performance subscales ('DoA' α=.67) in line with previous research (e.g. Boone, Soenens, Vansteenkiste, & Braet, 2012; Dunkley et al., 2000; Dunn et al., 2006; Van der Kaap-Deeder et al., 2016) and recent acknowledgements within the literature that these two scales represent the core facets of maladaptive perfectionism (range=0-65). The two subscales demonstrated good internal consistency within the current study (Total α=.88; CM α= .88; DoA= α=.75).

Self-criticism: The *Forms of Self-Criticising/Attacking Scale* (FSCRS; Gilbert, Clarke, Miles & Iron, 2004) is a 22-item measure of self-critical and self-reassuring thinking (*see* Appendix K). The self-criticism scale has two subscales, and a self-reassurance scale. In the current study, the self-criticism subscales were totalled together: 'inadequate self' ('IS'; α=0.90) and 'hated self '('HS'; α=0.86) to obtain a measure of self-criticism (Gilbert et al., 2004) with a range of scores between 0-56. In this study these subscales demonstrated excellent internal consistency (Total α=.94; IS α= 91; HS= α=.92).

Psychological flexibility: The *Acceptance and Action Questionnaire II* (AAQ-II; Bond et al., 2011) is a 7-item measure of psychological inflexibility (*see* Appendix L). Items are rated on a seven-point likert scale. The measure has demonstrated good internal consistency (α=0.84), test-retest reliability (α=.79) and validity (Bond et al., 2011). Total scores were

calculated (range=0-49).In the current study this measure demonstrated excellent internal consistency (α=0.94).

Psychological flexibility in relation to self-critical thoughts: The *Flexibility of Responses to Self-critical Thoughts Scal*e (FoReST; White et al., *in press*) is a 12-item measure of an "individual's ability to experience self-critical thoughts, whilst committing to value-directed action" (p.3; *see* Appendix M. It has shown good internal consistency in a nonclinical sample (α=.85). Total scores were calculated (range=0-84). In the current study this measure demonstrated excellent internal consistency (α=0.91).

Demographics and University Variables: Participants were additionally asked to provide details in relation to their gender, age, ethnicity, religion, sexuality, year of study, program of study, and university enrolment status.

Procedure

The study used a cross-sectional design. Ethical approval was given by University of Liverpool Health and Life Sciences Committee on Research Ethics (*see* Appendix N). Eligible SPs were recruited via the university's intranet, advertising materials (*see* Appendix P), social media (Twitter and Facebook). The author made direct contact with heads of departments and administration staff of each school (i.e. unit of the University of Liverpool involved) asking them to circulate recruitment emails via their student mailing lists. Advertising materials for the research included a link to a website where students could read information relating to the study including inclusion criteria, data confidentiality, and the right to withdrawal from the study (*see* Appendix O). Participants were invited to give informed consent if they wished to take part in the research (*see* Appendix P), and to indicate if they would like to be contacted for future studies. Consenting participants were then prompted to complete a number of self-report measures, and demographic questions presented via Qualtrics. Participants were free to

discontinue the study during any point. All students who took part in the study were automatically entered into a prize draw for £100 shopping vouchers.

Analyses

Initially, the assumptions of parametric tests were explored. Values for asymmetry and kurtosis lay between -2 and +2 for all non-frequency count variables - values that are considered acceptable in evidencing normal univariate distribution (George & Mallery, 2010). In the case of the two frequency count variables (VLi and VLc) these variables did not meet the assumptions of parametric requirements (due to negative skewness) and therefore non-parametric tests were performed and reported (*see* Table 5).

Correlational analyses were used to explore hypothesis A1-2 to B. A *forced entry hierarchical regression* was then conducted to explore relationships between self-critical thoughts, maladaptive perfectionism, valued living-*composite* (VLcom) score, psychological inflexibility and the dependent variable (DV) SWB as detailed in hypothesis C.

A multiple mediation analysis was then conducted using PROCESS (Hayes, 2017). The mediation hypothesised indirect effects of psychological inflexibility generally and psychological inflexibility specifically in relation to self-critical thoughts were explored (hypothesis D). In this model maladaptive perfectionism was the independent variable (IV), with SWB as the DV.

Multiple mediation analysis allows numerous mediators to be explored and reports the individual effects of each mediator whilst controlling for the other/s included (Hayes, 2013). As highlighted by Hayes (2013) this method allows researchers to formally compare mechanisms against one another in an integrated model that compares various indirect effects. Providing that the upper and lower bounds of the 95% bias-corrected CIs do not cross zero, the

indirect effect is deemed significant (Hayes, 2013). Beta weights indicate the magnitude of the indirect effect sizes. See Figure 4.

Results

Two hundred and seventy-four students completed the online study, of which 222 were female (81%) and 52 (19%) were male. Participants' ages ranged from 18 to 44 years old (*M*=22.77, *SD*=4.053). The majority of students identified as White British (*n*=203, 74.1%), and were undergraduates (*n*=245, 89.5%). The majority of participants that completed the study were medical students (*n*=103, 37.6%), followed by veterinary science students 62 (22.6%), and dentistry students 36 (13.1%). Participant characteristics are further illustrated in Table 4. University characteristics and degree program enrolment can be found in Appendix Q. With regards to SWB (measured using the MHC-SF), 7.3% of our sample were classed as 'languishing', (*n*=21), 45.6% of our sample as in 'moderate mental health' (n= 125), and 46.9% as 'flourishing' (n= 128). In relation to distress (as measured by the GHQ-12) 40.1% (n=110) of the current sample reported high distress levels meeting the established cut-off of ≥ 13 (please refer to measures section).

Correlations between study variables, means, standard deviations and Cronbach's alpha (α) values are presented in Table 5. In regards to hypotheses A.1-A.2, as predicted, lower levels of SWB (MHC-SF) were significantly associated with higher levels of psychological inflexibility (AAQ-II), and higher levels of psychological inflexibility in relation to self-critical thoughts (FoResT). As hypothesised lower levels of SWB (MHC-SF) was significantly associated with a lower number of highly important life domains (VLi), and a lower number of domains in which behaviour was rated as highly value consistent (VLc).

Table 4: **Details of Participant Demographics Characteristics**

Demographics		Total *n* (%)
Gender		
	Male	52 (19.0)
	Female	222(81.0)
	Non-binary	0 (0)
Sexuality		
	Hetrosexual or Straight	245 (89.4)
	Gay or Lesbian	7 (2.9)
	Bisexual	17 (6.2)
	Other	3 (1.1)
	Prefer not to say	2 (.7)
Religious Beliefs		
	No religion/ atheist/ agnostic	142 (51.8)
	Christian	89 (32.5)
	Buddhist	2 (.7)
	Hindu	7 (2.6)
	Jewish	2 (.7)
	Muslim	23 (8.4)
	Sikh	4 (1.5)
	Prefer not to say	5 (1.8)
Ethnicity		
	White British	203 (74.1)
	White Other	5 (1.8)
	White and Black Caribbean	3 (1.1)
	White and Asian	3 (1.1)
	Other Mixed / Multiple ethnic background	4 (1.5)
	Indian	21 (7.7)
	Pakistani	10 (3.6)
	Chinese	3 (1.1)
	Other Asian Background	6 (2.2)
	African	8 (2.9)
	Arab	6 (2.2)
	Any other ethnic group	1 (.4)
	Prefer not to say	1 (.4)

Lower levels of SWB MHC-SF) were significantly associated with higher levels of maladaptive perfectionism (FMPS), and higher levels of distress (GHQ-12). All effect sizes were of moderate to large magnitude, with the exception of correlations between valued living–*importance* (VLi) and SWB (MHC-SF); and valued living-*consistency* (VLc) and SWB, which were of small magnitude. Effect sizes were based on recommendations by Cohen (1988); small=(r=0.10), medium=(r=0.30), large=(r=0.50).

In regards to hypothesis B, as predicted, higher levels of maladaptive perfectionism (FMPS) were significantly associated with higher levels of psychological inflexibility (AAQ), and higher levels of psychological inflexibility in relation to self-critical thoughts (FoResT) with large effect sizes. Higher levels of maladaptive perfectionism (FMPS) were also, as hypothesised, significantly associated with a lower number of highly important life domains (VLi), and lower number of domains in which behaviour was rated as highly value consistent (VLc), these relationships being of small magnitude.

Lastly, as hypothesised, higher levels of self-critical thoughts (FSCRS) were significantly associated with higher levels of psychological inflexibility (AAQ-II) and higher levels of psychological inflexibility in relation to self-critical thoughts (FoResT) with large effect sizes. Higher levels of self-criticism were also significantly associated with a lower number of highly important life domains (VLi) and a lower number of domains in which behaviour rated as highly value consistent (VLc), with effect sizes being of small magnitude.

Table 5: Means, Standard Deviations, Correlations between Variables, and Cronbach's Alpha, N=274.

(Pearson's correlations are reported with the exception of VLi and VLc where Spearman's correlations are presented).

	Mean (±SD)	α	1	2	3	4	5	6	7	8
1. Wellbeing	43.52 (14.86)	.94	_	.22***	.32***	-.55***	-.60***	-.48***	-.61***	-.48***
2. Valued Living - importance (VLi)[1]	8.40 (1.47)	.69		_	.37***	-.17**	-.15*	-.17**	-.19***	-.09*
3. Valued Living - consistency (VLc)[2]	6.33 (2.06)	.76			_	-.24***	-.28***	-.25***	-.34***	-.22***
4. Self-criticism	18.66 (19.78)	.94				_	.70***	.61***	.54***	.66***
5. Psychological inflexibility	23.93 (9.28)	.91					_	.72***	.62***	.58***
6. Psychological inflexibility (S-C)[3]	36.26 (12.97)	.89						_	.50***	.53***
7. Distress	15.21(6.99)	.90							_	.43***
8. Maladaptive Perfectionism	27.69 (10.09)	.88								_

*** p<.0015 (alpha adjusted by Bonferroni correction) **p< .01 *p < .05 (two-tailed)
[1&2] Valued based action (importance) and value based action (consistency) = number of domains rated as 5/10 or above. Spearman's correlations reported.
[3] Psychological flexibility in relation to self-critical thoughts as measured by the FoResT.
α= Cronbach's Alpha

Hierarchical regression was then used to analyse the effects of maladaptive perfectionism, self-critical thoughts, psychological inflexibility and valued living-*composite* score (VLcom) on SWB as outlined in hypothesis C. In Step 1 maladaptive perfectionism and self-critical thoughts were entered. In step 2 psychological inflexibility and valued living-*composite* (VLcom) were then added. Multicollinearity was assessed; no Variation Inflation Factor exceeded 10 (all below 3), no tolerance values were below.1 (Menard, 1995) and none of the correlation coefficients among the predictors exceeded .80 (Berry & Feldman, 1985; Field, 2009). The results of the regression analyses are summarized in Table 6.Overall the regression model predicted approximately 45% of the variance in SWB (R^2=.45, F (4,270) =55.77, p<.001). On this basis hypothesis B was supported. Table 6 illustrates that step 1 of the regression predicted approximately 33% of the variance in subjective wellbeing, this being significant, with both higher levels of maladaptive perfectionism and self-critical thoughts independently predicting lower levels of subjective wellbeing.

After controlling for all the aforementioned variables, step 2 predicted an additional 12% of unique variance in subjective wellbeing; with both lower levels of psychological inflexibility and higher levels of valued living-*composite* (VLcom) independently predicting SWB (R^2=0.12, F(2, 269)=31.48, p<0.001). It is noteworthy that at stage 2, when psychological flexibility and valued living-*composite* (VLcom) were added, the contribution of maladaptive perfectionism became non-significant. Given that there is no evidence of multicollinearity, this is consistent with the idea that one of the former two variables may mediate the relationship between maladaptive perfectionism and subjective wellbeing. Overall, the strongest predictor of SWB was psychological flexibility.

Table 6: Hierarchal Regression Analyses Predicting Levels of Subjective Wellbeing, n=274

	Wellbeing	
Predictor	ΔR^2	β
Step 1	.33***	
Maladaptive Perfectionism		- .22**
Self-Critical Thoughts		- .40***
Step 2	.45***	
Maladaptive Perfectionism		-.11
Self-Critical Thoughts		-.15*
Psychological Inflexibility		-.34***
Values-Based Action[1]		.26***

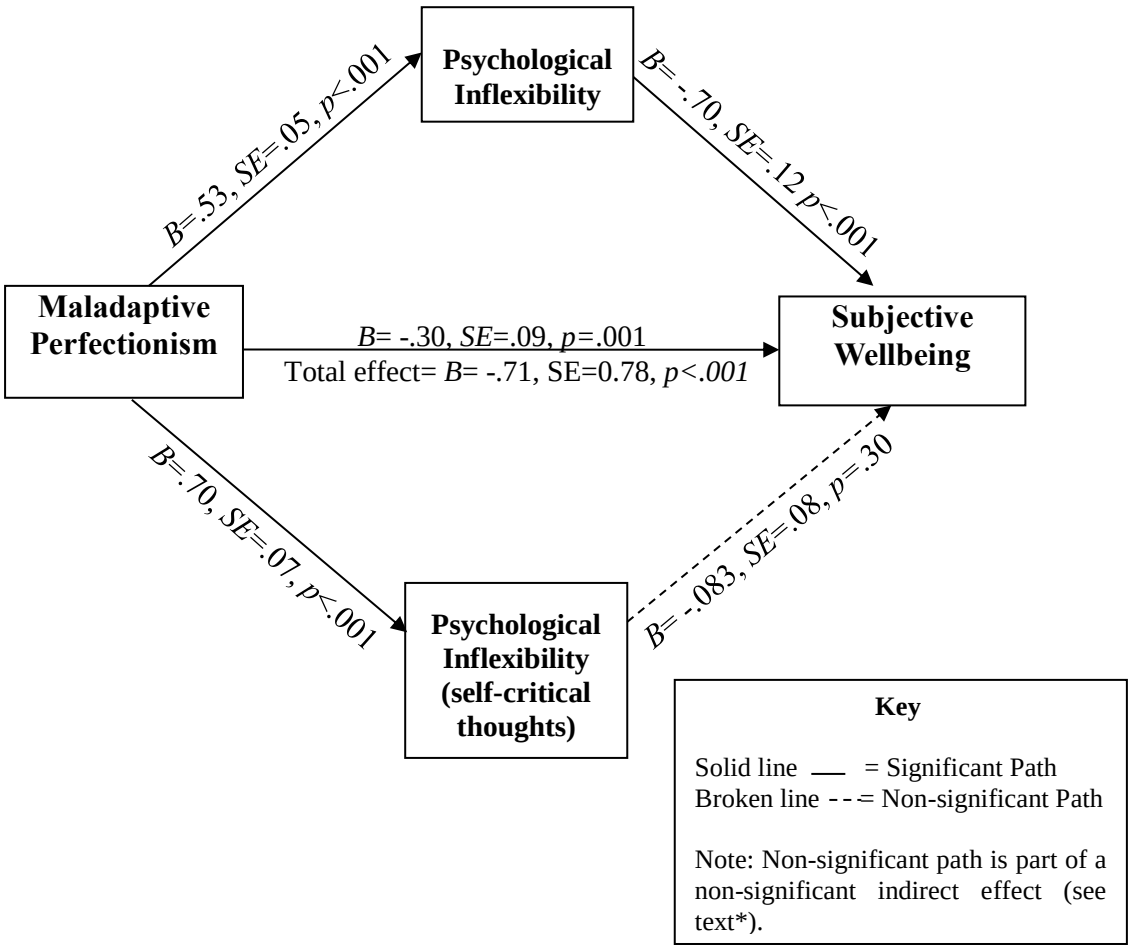
* p<.05, * p<.001**, p<.0001***

[1]Values Living-*composite* score (VLcom) calculated by multiplying scores of values-based action (importance) and valued-based action (consistency) and computing the mean values as specified by Wilson et al, (2010).

In order to investigate hypothesis D, a multiple mediation analyses was performed to explore the direct and indirect effects of the independent variable (IV) maladaptive perfectionism (as measured by FMPS scores), on the dependant variable (DV) SWB (as measured by MHC-SF scores), with psychological inflexibility measures as mediators (psychological inflexibility measured b y AAQ-II scores; psychological inflexibility in relation to self-critical thoughts measured by the FoResT).

As illustrated in Figure 4, maladaptive perfectionism significantly predicted higher levels of psychological inflexibility (*B*=.53, *SE*=.05, *p*<.0001, 95 % CI=.45 to .63), and psychological inflexibility in relation to self-critical thoughts (*B*=.70, *SE*=.07, *p*<.0001, 95 % CI=.55 to .81). Higher levels of psychological inflexibility significantly predicted lower levels of SWB (*B*=-.70, *SE*=.12, *p*<.0001, 95% CI=-.91 to -.45). Higher levels of psychological inflexibility in relation to critical thoughts did not predict subjective wellbeing.

Figure 4: Multiple Mediation Analyses with Maladaptive Perfectionism as the Independent variable (IV), SWB as the Dependent Variable (DV) and Psychological Inflexibility and 'Psychological Inflexibility in Relation to Self-Critical Thoughts' as Mediators



The total and direct effects of maladaptive perfectionism on SWB were both significant (Total: *B*= -.71, *SE*=.078, *p*<.001, 95% CI= -.87 to -.56; Direct: -.30, SE=0.9, *p*=.001 CI= -.46 to -.11). Importantly, there was a significant indirect effect of maladaptive perfectionism on SWB through psychological inflexibility (as measured by the AAQ-II) (*B*=-.37, *SE*=.08, *CI* 95%=-.53 to -.22). Psychological inflexibility accounted for approximately 50% of the total effect $P_{m=.}$52. Psychological inflexibility in relation to critical thoughts (as measured by the

FoResT) was not found to be a significant mediator of maladaptive perfectionism and subjective wellbeing*.

Discussion

The current study aimed to explore psychological factors which predict SWB in a sample of SPs. There was a specific interest in investigating the potential mediating role that a purported ACT process of change construct (i.e. psychological flexibility) plays in the association between maladaptive perfectionism and subjective wellbeing. In doing so, the current research aimed to take a preliminary step in determining whether ACT could be a potentially useful framework for understanding wellbeing, and in potentially preventing or ameliorating mental health difficulties experienced by SPs.

As hypothesised lower levels of SWB were significantly associated with higher levels of psychological inflexibility (as measured by the AAQ-II and FoResT). Furthermore, lower levels of SWB were significantly associated with a lower number of highly important life domains (VLi), and lower number of domains in which behaviour was deemed highly value consistent (VLc). These findings are consistent with the contextual behavioural science underpinnings of ACT, and previous research in other clinical and non-clinical populations in which lower psychological inflexibility has been linked to higher SWB (Hayes et al., 2006; Wersebe et al., 2018). Whilst comparatively less research has examined valued-based processes in relation to such outcomes, the current findings are in line with a small number of studies demonstrating that valued living is associated with increased wellbeing in both healthcare professionals and chronic pain sufferers (McCracken & Yang, 2008; Trompetter et al., 2013).

The current study further hypothesized that SWB and levels of distress would be negatively correlated in the current sample. This hypothesis was supported. The findings are

consistent with the 'dual-factor model' of mental health (Keyes, 2002; Westerhof & Keyes, 2010) in which SWB and distress have been theorised to be distinct yet related concepts, which are complementary and share some overlap. In the current study distress and SWB partially overlapped, sharing 37% (R^2) of variance with one another. This is further illustrated when we consider that 40.1% (n=110) percent of the current sample of SPs reported high levels of distress (meeting "caseness"), yet on the measure of SWB 45.6% of our sample were classed as being in 'moderate mental health' (n= 125) and 46.9% as 'flourishing' (i.e. highest level of wellbeing; n= 128) with 7.3% of our sample classed as 'languishing' (i.e. the lowest level of wellbeing; *n*=21).

As previous authors have highlighted, SWB does not necessarily equate to an absence of psychological distress, and vice-versa (Keyes, 2002; Westerhof & Keyes, 2010). A recent study by Van Dijk, Lucassen, Van Weel & Speckens (2017) conducted with Dutch medical students found that overall clinical caseness for distress amongst this sample was 21%, yet also highlighted that *of these* students meeting clinical criteria 77% reported "moderate mental health" and 18% were reported as "flourishing". Research indicates that a "flourishing" level of wellbeing may attenuate the effects of psychological distress. For example, Dyrbye et al (2012) found that the incidence of suicidal ideation, thoughts of leaving professional training, and the prevalence of unprofessional practice reduced as SWB increased in medical students. The 40.1% prevalence rate of "caseness" for distress is similar to rates of clinical distress previously reported in SPs, which have ranged from 21%-54% (Dahlin, & Runeson 2007; Makhal et al., 2015; VanDijk et al., 2017). The high proportion of distressed SPs who responded to this survey merits concern.

In regards to perfectionism, as hypothesized, the results of this study found that higher levels of maladaptive perfectionism were significantly associated with lower levels of subjective wellbeing. Consistent with previous research conducted in a community sample, the

strength of this association was of moderate magnitude (e.g. Kenny & Hicks, 2014). Furthermore, as predicted, higher levels of maladaptive perfectionism were associated with higher levels of psychological inflexibility (as measured by the AAQ-II), and psychological inflexibility in relation to self-critical thoughts (as measured by the FoResT). These findings echo the findings of limited available research exploring these two constructs, which have also reported large associations between maladaptive perfectionism and psychological inflexibility in undergraduate university students (e.g. Crosby et al., 2010). The present study was the first to utilise the FoReST measure in relation to perfectionism, and found a large association between these constructs, suggesting that individuals high in perfectionism may respond to self-critical cognitions related to maladaptive perfectionism more inflexibly.

Self-criticism (as measured by the FSCRS) was also, as hypothesised, significantly associated with higher levels of psychological inflexibility (as measured by the AAQ-II) and psychological inflexibility specifically in relation to these negative self-evaluations (as measured by the FoResT). The magnitude of these associations was comparable to previous research, in which large effect sizes have been reported (e.g. White et al., *in press*). Furthermore, higher levels of self-criticism in this study were associated with a lower number of highly important life domains (VLi), and lower number of domains in which behaviour was rated as highly value consistent (VLc). This finding suggests that SPs who are more self-critical of themselves, may be less psychologically flexible and less likely to be able to identify life domains as important or engage in behaviours that are consistent with valued-life domains. Whilst little research has explored valued-based processes in relation to self-criticism, there is some evidence to suggest that self-criticism is associated with other aspects of psychological flexibility. For example, this construct has been previously linked to higher levels of cognitive fusion (one of six subcomponents of psychological inflexibility) defined as a propensity to regard internal experiences as literal truths (Hayes, Strosahl, & Wilson, 2012).

As predicted, regression analysis revealed that maladaptive perfectionism, self-critical thoughts, and ACT processes (i.e. psychological flexibility, valued living-*composite* VLcom) accounted for a substantial amount of variance in subjective well-being within the current sample, accounting for 45% of variance in subjective wellbeing. When considered in isolation (in the first stage of the regression), maladaptive perfectionism and self-criticism explained 33% of variance in subjective wellbeing, and were both highly significant, independent predictors of subjective wellbeing. This finding is supportive of previous studies, which have reported both constructs as predictive of wellbeing (and the related broader concept of positive mental health) in community and university student samples (Fritzsche, 2016; Stoeber & Corr, 2016).

In the second stage of the regression, adding psychological flexibility and valued living-*composite* (VLcom) increased the predictive power of the model to 45% as noted above (a significant 12 percentage point increase) and both were highly significant predictors of subjective wellbeing. This finding suggests it is not solely the objective presence of self-cognitions in relation to criticism or maladaptive perfectionism that are important in predicting wellbeing in SPs. Rather, it is the extent to which SPs can be psychologically flexible in response to such cognitions and take action towards personal values which may be important. Furthermore, psychological flexibility emerged as the strongest predictor of SWB when all other variables were considered. It is of note that whilst self-critical thoughts remained significant at this stage, perfectionism was a marginally non-significant predictor (p=.08).

The regression model accounted for a substantial proportion of variance, yet a large proportion remained unaccounted for. Whilst this study focused predominately on psychological phenomena and internal processes, there is a vast amount of literature evidencing a number of contextual factors (e.g. systematic, organisational, and economical variables) which may impact on the SWB of SPs. For example, to date a number of studies have

highlighted the impact of lack of social support, academic stress (i.e. heavy workloads, demanding curricula), transitions to clinical practice, fatigue, and concern regarding debts on wellbeing and distress amongst SPs (Bore, Kelly, & Nair, 2016; Dyrbye et al., 2005; Preoteasa, Axante, Cristea, & Preoteasa, 2016; Rogers, Creed & Searle, 2012). In a recent large scale, cross-sectional study of 657 nursing students exploring potential protective factors for enhancing SWB, it was found that social support (from family and significant others) was positively associated with increased SWB in this group, as well as their ability to deal with stressful events (Hea, Turnbullb, Kirshbaumb, Phillipsb, & Klainin-Yobas, 2018).

Indeed, a number of social-ecological models have emphasised the multiple community, organisational and societal factors and conditions that may influence SWB. For example, Dahlgren and Whitehead's (1991) theoretical 'rainbow model' of determinants of health distinguishes between micro, meso, and macro-level factors. This model places individuals at the centre, surrounded by a number of influential 'layers' such as lifestyle factors, social and community networks, socioeconomic, cultural and environmental conditions. Consistent with this idea, the World Health Organisation (WHO) have highlighted the importance of *both* the subjective, and objective (i.e. social and community) dimensions of wellbeing "wellbeing comprises of an individual's experience of their lives, as well as a comparison of life circumstances with social norms and values" (WHO, 2013, pp.1)

The multiple mediation analysis confirmed that psychological inflexibility (as measured by the AAQ-II) mediated the relationship between maladaptive perfectionism and SWB (a significant indirect effect). In this mediation, maladaptive perfectionism significantly predicted psychological inflexibility, psychological inflexibility significantly predicted lower levels of subjective wellbeing, and there was a significant direct effect (negative relationship) between maladaptive perfectionism and subjective wellbeing. In this model, psychological

flexibility in relation to self-critical thoughts (as measured by the FoResT) did not mediate the relationship between maladaptive perfectionism and wellbeing.

This was the first study to explore the relationship between maladaptive perfectionism, psychological flexibility and subjective wellbeing. However, these findings are in line with previous research that has highlighted that avoidant forms of coping mediate the relationship between maladaptive perfectionism and depression in a student population (Dunkley et al., 2000). These findings give further support to the assertion that it is not merely presence of internal thoughts or emotions typically associated with maladaptive perfectionism but how SPs respond psychologically and behaviourally to these experiences that may be instrumental in predicting SWB in this group.

As stated, the FoResT (a measure of psychological flexibility in relation to self-critical thoughts) was not a significant mediator of the relationship between maladaptive perfectionism and SWB in the above model. Relative to the FoReST, the AAQ-II is a more global measure of psychological flexibility that arguably captures *both* the way SPs may respond to negative self-evaluations (e.g. "If I fail at work or school, I am a failure as a person"), *and* the doubts and uncertainties they hold about their own actions (e.g. "I usually have doubts about the simple everyday things I do"). As such, it is perhaps unsurprising that the AAQ-II and not the FoReST mediated the associations between maladaptive perfectionism and subjective wellbeing.

It is important to note that whilst our study differentiated maladaptive perfectionism from self-criticism, a small number of studies have combined these two constructs into a superordinate 'self-critical perfectionism' construct (i.e. Gautreau, Sherry, Mushquash, & Stewart, 2015) and that further research could explore this construct in relation to SP wellbeing, and psychological flexibility. Furthermore, there is ongoing debate within the literature as to whether or not maladaptive perfectionism predicts maladjustment beyond self-criticism, with inconsistent findings between studies (Sherry, Stoeberb, & Ramasubbu, 2016; Dunkley,

Blankstein, Masheb, & Grilo, 2006). Further research may wish to explore these issues further, potentially in the context of SPs and different outcomes such as SWB.

Strengths and limitations

The current study utilised a cross-sectional design. In order to explore causality, and variations in wellbeing or distress overtime, longitudinal designs would need to have been utilised. The current study recruited people from one University, and whilst many of the included programs confer to accreditation criteria implemented across the UK, the influence of geographical locality, university structure and organisational culture could not be controlled for. Therefore, a degree of caution should be exercised in any efforts to generalise the findings of this study. The sample was predominantly White, British females (74%) and may not be representative of SP populations in the UK more broadly. For example, a recent report produced by the general medical council (GMC) reported that across the UK, males made up 45% of medical students across the UK (GMC, 2016). In this report, 61% of UK medical students identified themselves as White (GMC, 2016). The lack of representative samples recruited has been noted previously by studies in this research field, and may reflect a degree of self-selection bias in the current study.

Full consideration of the multiple, broader contextual factors highlighted earlier in this paper were beyond the scope of the current study. Instead, the focus of the current study was on more 'micro' level determinants of subjective wellbeing in SPs. Whilst there exists a wealth of literature examining these social-ecological factors, one area which merits further exploration is SPs sense of social and professional belongingness and how this relates to SWB. A lack of belongingness (defined as the degree to which an individual feels accepted, valued and connected to a group; Levett, Lathlean, Maguire, & McMillian, 2007) has previously been

linked to stress, low self-esteem and reduced training satisfaction in SPs (Levett et al., 2007; Kim & Park, 2011) but as yet links to SWB have not been examined. Future studies may wish to explore the relationship between belongingness and SWB in this group longitudinally throughout training using repeated measures designs. Furthermore, a number of recent studies in this area have highlighted the need for mixed methodologies (qualitative and quantitative) which triangulate findings from both students and SPs to further understand how belongingness may be enhanced and supported throughout teaching and clinical placements (e.g. Ashktorab, Hasanvand, Seyedfatemi , Salmani, & Hosseini, 2017).

Notwithstanding these potential limitations, the study makes a key contribution to the existing research base, and provides recommendations for further research which seeks to devise mental health promotion and/ or preventative interventions for SPs. Furthermore, to the author's knowledge, this is the first study that has investigated, and provided support for psychological flexibility as a mediating variable between maladaptive perfectionism and SWB. Additionally, this was the first study to utilise and investigate a new measure of psychological flexibility (FoResT) in this population. Finally, a notable strength of this study is its relatively large sample size. It is interesting to note that participants were recruited in a relatively short period of time (4 months) perhaps reflecting a high degree of interest in research which may improve wellbeing in SPs.

Clinical Implications

The identification of psychological flexibility as a mediator between maladaptive perfectionism and SWB lends support for further exploration of the potential application of contextual behavioural science approaches (including ACT) as a framework for helping to foster improved SWB in SPs. Identifying effective interventions for improving SWB may help SPs to continue and fully engage in training, and attenuate the effects of psychological distress

that can be common within this population, and age group. Furthermore, improving wellbeing may have wider, longitudinal implications in preventing or 'buffering 'against physical and mental health difficulties in SPs whilst in training, and as they go on to join the workforce (e.g. NHS) after qualifying.

Future research may wish to conduct feasibility studies to determine whether ACT interventions are acceptable to SPs, which formats may be appropriate for this group, and whether there are treatment signals indicating that such interventions may help SPs to manage stresses inherent to clinical training, and engage in a wider range of personally valued life domains (e.g. self-care). Such interventions are an important step towards universities taking a more active role in mental health promotion in line with recent government-led strategies (e.g. University UK Framework, 2017).

ACT is a normalising, non-stigmatising intervention which can be delivered in multiple formats. For example, recent RCTs have demonstrated the efficacy of ACT when delivered online (e.g. Pots et al., 2016), through self-help materials (e.g. Fledderus, Bohlmeijer, Pieterse, & Schreurs, K, 2012), in groups (e.g. Majumdar & Morris, 2018), as well as one to one formats (e.g. Petersen & Zettle, 2009). If feasibility and pilot studies evidence the acceptability, relevance and potential utility of ACT interventions for improving the SWB of SPs, then future randomised controlled trials may be merited to evaluate the efficacy of these approaches. Whilst this further research is required to inform the specific format of future interventions, a mixture of initial group and online web-based sessions embedded into existing university curricula and web platforms may be suited to this cohort. A number of web-based ACT protocols have been developed previously in other populations with sessions covering core transdiagnostic ACT processes that aim to enhance psychological flexibility and SWB e.g. developing mindfulness skills, identifying personal values, committed action and goal setting (e.g. Pots et al., 2016; Trompetter et al., 2014). These manuals may be adapted to suit SPs and

their specific needs, and may wish to incorporate sessions or modules explicitly focusing on maladaptive forms of perfectionism in order to both normalise and make materials/case examples relevant to SPs. Over recent decades, an extensive body of literature has investigated perfectionism and self-criticism in relation to different populations and difficulties (e.g. anxiety, depression, suicidal ideation, workplace stress, and sports performance; Egan, Wade, & Shafran, 2011; Hewitt & Flett, 2002). The current study highlights that these constructs, as well as *additional* transdiagnostic processes such an individual's ability to respond flexibility to related internal phenomena (e.g. thoughts, feelings) are important in our understanding of SWB in SPs.

Conclusion

Four out of every ten SPs who participated in the study met clinical caseness for distress, and less than half the sample was experiencing the highest level of subjective wellbeing. This merits considerable concern and has important implications for HEIs, providers of clinical and health training, and prospective employers of SPs (e.g. NHS). Psychological flexibility (the central theorised process of change in ACT) was found to be the strongest predictor of SWB in this group, followed by valued living-*composite* (VLcom). Furthermore, psychological flexibility was found to mediate the relationship between maladaptive perfectionism and subjective wellbeing. Further feasibility and pilot research is merited to: explore the acceptability, relevance and utility of contextual behavioural science approaches (including ACT interventions) for SPs, and consider how interventions aimed at improving SWB and reducing distress might be best integrated into university curricula.

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Appendix A: Author Guidelines for the Journal of Contextual Behavioural Sciences

Further information is on author guidelines is available at:
https://www.elsevier.com/journals/journal-of-contextual-behavioral-science/2212-1447/guide-for-authors

Types of article

Empirical research. JCBS welcomes manuscripts across a breadth of domains from basic behavioral science to clinical trials. Research concerning the measurement and testing of process of change is particularly welcome. Potential methodologies include but are not limited to: randomized controlled trials, single case experimental designs, cross-sectional and prospective cohort studies, mixed-methods designs, small scale analog studies. Papers reporting null findings are also welcome if their methodology is sound and their power sufficient. Authors of such papers will need to emphasize the implications of their findings for future research and practice.

Review articles. Manuscripts reviewing a wide range of topics are encouraged as long as their content is directly relevant to CBS. Systematic reviews and meta-analyses are particularly welcome.

Article structure

Subdivision - unnumbered sections
Divide your article into clearly defined sections. Each subsection is given a brief heading. Each heading should appear on its own separate line.

Introduction
State the objectives of the work and provide an adequate background, avoiding a detailed literature survey or a summary of the results.

Material and methods
Provide sufficient details to allow the work to be reproduced by an independent researcher. Methods that are already published should be summarized, and indicated by a reference. If quoting directly from a previously published method, use quotation marks and also cite the source. Any modifications to existing methods should also be described..

Results
Results should be clear and concise.

Discussion
This should explore the significance of the results of the work, not repeat them. A combined Results and Discussion section is often appropriate. Avoid extensive citations and discussion of published literature.

Conclusions
The main conclusions of the study may be presented in a short Conclusions section, which may stand alone or form a subsection of a Discussion or Results and Discussion section.

Appendices
If there is more than one appendix, they should be identified as A, B, etc.

Essential title page information

• ***Title.*** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
• ***Author names and affiliations.*** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. You can add your name between parentheses in your own script behind the English transliteration. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
• ***Corresponding author.*** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. This responsibility includes answering any future queries about Methodology and Materials. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**

Abstract

A concise and factual abstract is required. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

Keywords

Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, 'and', 'of'). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

Reference style
Text: Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 978-1-4338-0561-5, copies of which may be ordered online or APA Order Dept., P.O.B. 2710, Hyattsville, MD 20784, USA or APA, 3 Henrietta Street, London, WC3E 8LU, UK.

Appendix B: Complete Medline Search

7/15/2018 Ovid: Abstract Reference

Database(s): **Ovid MEDLINE(R)** 1946 to July 13, 2018

Search Strategy:

#	Searches	Results
1	"acceptance and commitment therapy".mp.	502
2	(ACT adj3 therap*).ti,ab.	1959
3	(ACT adj3 intervention).ti,ab.	150
4	(ACT adj3 treatment).ti,ab.	1134
5	"Acceptance and Commitment Therapy"/	234
6	1 or 2 or 3 or 4 or 5	3209
7	randomi*ed controlled trial.mp.	476833
8	controlled clinical trial.mp.	102438
9	randomi*ed.ab.	435637
10	placebo.ab.	173548
11	waitlist*.ab.	1539
12	wait*list*.ab.	1540
13	(control* or treatment as usual or TAU).ab.	2828420
14	groups.ab.	1572190
15	trial.ab.	377016
16	randomized controlled trial.pt.	463677
17	controlled clinical trial.pt.	92475
18	7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17	4251926
19	wellbeing.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	8840
20	well-being.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	51562
21	wellness.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	6388
22	happiness.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	6691
23	happy.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	6961
24	thriv*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	10705
25	flourish*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	2559
26	pleasure.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	5931
27	joy.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1644
28	(life adj2 satisfaction).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	6929
29	(satisfaction adj2 with life).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1725
30	strength*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	305630
31	blessing*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	827
32	virtue*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	13990
33	fulfilment.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	825
34	eudaimonia.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	25
35	eudaemonia.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	3
36	hedonism.mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	140
37	(good adj2 life).mp. [mp=title, abstract, original title, name of substance word, subject heading word, floating sub-heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]	1061
38	Mental Health/	31174
39	19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30 or 31 or 32 or 33 or 34 or 35 or 36 or 37 or 38	445092
40	6 and 18 and 39	114
41	limit 40 to (english and humans)	109

http://ovidsp.tx.ovid.com.liverpool.idm.oclc.org/sp-3.31.1b/ovidweb.cgi?&S=FOEEFPFHOODDELJCNCEKMAOBMEGMAA00&SELECT=S.sh%7c&R=41&Proce

Appendix C: Measures of Subjective Wellbeing (Cooke et al, 2016)

Standardised Measure of SWB	Classification of Measure
Australian Unity Index of Subjective Well-BeingDelighted-Terrible Scale European Social Survey Happiness Item Happiness Measures Ladder of Life Scale Life Satisfaction Research Questionnaire MIDUS II-Satisfied With life Item National Survey University of Michigan – Happiness Item Satisfaction with Life Scale Short Depression-Happiness Scale Subjective Happiness Scale World Values Survey	Hedonic Measures
Basic Needs Satisfaction Flourishing Psychological Well-Being Scale Questionnaire for Eudaimonic Well-Being Social Well-Being	Eudaimonic Measures
Five Factor Wellness Evaluation of Lifestyle Life Assessment Questionnaire Optimal Living Profile Perceived Wellness Survey TestWell Wellness Evaluation of Lifestyle Wellness Inventory	Wellness Measures
12-Item Well-Being Questionnaire Authentic Happiness Inventory COMPAS-W Gallup-Healthways Well-Being Index General Well-Being Schedule Life Satisfaction Index Medical Outcome Studies Short Form-36 Mental Health Continuum Short Form Oxford Happiness Questionnaire Oxford Happiness Inventory Pemperton Happiness Index Psychological General Well-Being Index-Revised	Composite measures

Warwick-Edinburgh Mental Well-Being Scale WHO-Ten Well-Being Index	

Appendix D: Screening Tool

Review questions:

- What are the ranges of standardised SWB measures being used in the research?
- What is the efficacy of ACT for bringing about changes in subjective well-being?

4. What risks of bias are inherent in the relevant studies?

Inclusion criteria (based on PICOS)
Population: 18 years or above
Intervention: Face-to-face interventions described by authors as ACT(group, one-to-one format), or guided/supported forms of ACT self-help interventions (i.e. an ACT intervention where the participant has had at least minimal contact with a practitioner linked to the intervention)
Comparator: Either an active comparison intervention, and/or a control
Outcome: Subjective wellbeing
Study design: RCT

ACT and Subjective Wellbeing Screening and Selection Tool

Reviewer name:	**Date:**
Author name/ study ID:	**Year:**
Title:	**Journal:**

	Include	**Exclude**
Patient population	☐ Adults-aged 18 or over	☐ Children/young people- aged under 18
Intervention	☐ Face-to-face ACT interventions (1 to1 or group)**OR** ☐ Guided/ supported ACT interventions (i.e. participant has at least minimal contact with a practitioner)	☐ All unguided/unsupported self-help ACT interventions ☐ Any ACT intervention that is combined with another form of intervention.
Outcomes	☐ Validated measure of subjective wellbeing	☐ No Validated measure of subjective wellbeing
Study design	☐ RCT ☐ English Language ☐ In peer reviewed journal	☐ Not an RCT ☐ Not English Language ☐ Not in a peer-reviewed journal ☐ reanalysis of data from a subsample of a previously published

Overall Decision: **Included** ☐ **Excluded** ☐

Notes:

Appendix E: Risk of Bias Criteria

RANDOM SEQUENCE GENERATION **Selection bias (biased allocation to interventions) due to inadequate generation of a randomised sequence.**	
Criteria for a judgement of 'Low risk' of bias.	The investigators describe a random component in the sequence generation process such as: • Referring to a random number table; • Using a computer random number generator; • Coin tossing; • Shuffling cards or envelopes; • Throwing dice; • Drawing of lots; • Minimization*. *Minimization may be implemented without a random element, and this is considered to be equivalent to being random.
Criteria for the judgement of 'High risk' of bias.	The investigators describe a non-random component in the sequence generation process. Usually, the description would involve some systematic, non-random approach, for example: • Sequence generated by odd or even date of birth; • Sequence generated by some rule based on date (or day) of admission; • Sequence generated by some rule based on hospital or clinic record number. Other non-random approaches happen much less frequently than the systematic approaches mentioned above and tend to be obvious. They usually involve judgement or some method of non-random categorization of participants, for example: • Allocation by judgement of the clinician; • Allocation by preference of the participant; • Allocation based on the results of a laboratory test or a series of tests; • Allocation by availability of the intervention.
Criteria for the judgement of 'Unclear risk' of bias.	Insufficient information about the sequence generation process to permit judgement of 'Low risk' or 'High risk'.
ALLOCATION CONCEALMENT **Selection bias (biased allocation to interventions) due to inadequate concealment of allocations prior to assignment.**	
Criteria for a judgement of 'Low risk' of bias.	Participants and investigators enrolling participants could not foresee assignment because one of the following, or an equivalent method, was used to conceal allocation: • Central allocation (including telephone, web-based and pharmacy-controlled randomization); • Sequentially numbered drug containers of identical appearance;

	• Sequentially numbered, opaque, sealed envelopes.
Criteria for the judgement of 'High risk' of bias.	Participants or investigators enrolling participants could possibly foresee assignments and thus introduce selection bias, such as allocation based on: • Using an open random allocation schedule (e.g. a list of random numbers); • Assignment envelopes were used without appropriate safeguards (e.g. if envelopes were unsealed or nonopaque or not sequentially numbered); • Alternation or rotation; • Date of birth; • Case record number; • Any other explicitly unconcealed procedure.
Criteria for the judgement of 'Unclear risk' of bias.	Insufficient information to permit judgement of 'Low risk' or 'High risk'. This is usually the case if the method of concealment is not described or not described in sufficient detail to allow a definite judgement – for example if the use of assignment envelopes is described, but it remains unclear whether envelopes were sequentially numbered, opaque and sealed.
BLINDING OF PARTICIPANTS AND PERSONNEL **Performance bias due to knowledge of the allocated interventions by participants and personnel during the study.**	
Criteria for a judgement of 'Low risk' of bias.	Any one of the following: • No blinding or incomplete blinding, but the review authors judge that the outcome is not likely to be influenced by lack of blinding; • Blinding of participants and key study personnel ensured, and unlikely that the blinding could have been broken.
Criteria for the judgement of 'High risk' of bias.	Any one of the following: • No blinding or incomplete blinding, and the outcome is likely to be influenced by lack of blinding; • Blinding of key study participants and personnel attempted, but likely that the blinding could have been broken, and the outcome is likely to be influenced by lack of blinding.
Criteria for the judgement of 'Unclear risk' of bias.	Any one of the following: • Insufficient information to permit judgement of 'Low risk' or 'High risk'; • The study did not address this outcome.
BLINDING OF OUTCOME ASSESSMENT **Detection bias due to knowledge of the allocated interventions by outcome assessors.**	
Criteria for a judgement of 'Low risk' of bias.	Any one of the following: • No blinding of outcome assessment, but the review authors judge that the outcome measurement is not likely to be influenced by lack of blinding; • Blinding of outcome assessment ensured, and unlikely that the blinding could have been broken.
Criteria for the judgement of 'High risk' of bias.	Any one of the following: • No blinding of outcome assessment, and the outcome measurement is likely to be influenced by lack of blinding;

	• Blinding of outcome assessment, but likely that the blinding could have been broken, and the outcome measurement is likely to be influenced by lack of blinding.
Criteria for the judgement of 'Unclear risk' of bias.	Any one of the following: • Insufficient information to permit judgement of 'Low risk' or 'High risk'; • The study did not address this outcome.
INCOMPLETE OUTCOME DATA **Attrition bias due to amount, nature or handling of incomplete outcome data.**	
Criteria for a judgement of 'Low risk' of bias.	Any one of the following: • No missing outcome data; • Reasons for missing outcome data unlikely to be related to true outcome (for survival data, censoring unlikely to be introducing bias); • Missing outcome data balanced in numbers across intervention groups, with similar reasons for missing data across groups; • For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk not enough to have a clinically relevant impact on the intervention effect estimate; • For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes not enough to have a clinically relevant impact on observed effect size; • Missing data have been imputed using appropriate methods.
Criteria for the judgement of 'High risk' of bias.	Any one of the following: • Reason for missing outcome data likely to be related to true outcome, with either imbalance in numbers or reasons for missing data across intervention groups; • For dichotomous outcome data, the proportion of missing outcomes compared with observed event risk enough to induce clinically relevant bias in intervention effect estimate; • For continuous outcome data, plausible effect size (difference in means or standardized difference in means) among missing outcomes enough to induce clinically relevant bias in observed effect size; • 'As-treated' analysis done with substantial departure of the intervention received from that assigned at randomization; • Potentially inappropriate application of simple imputation.
Criteria for the judgement of 'Unclear risk' of bias.	Any one of the following: • Insufficient reporting of attrition/exclusions to permit judgement of 'Low risk' or 'High risk' (e.g. number randomized not stated, no reasons for missing data provided); • The study did not address this outcome.
SELECTIVE REPORTING **Reporting bias due to selective outcome reporting.**	
Criteria for a judgement of 'Low risk' of bias.	Any of the following: • The study protocol is available and all of the study's pre-specified (primary and secondary) outcomes that are of interest in the review have been reported in the pre-specified way;

	• The study protocol is not available but it is clear that the published reports include all expected outcomes, including those that were pre-specified (convincing text of this nature may be uncommon).
Criteria for the judgement of 'High risk' of bias.	Any one of the following: • Not all of the study's pre-specified primary outcomes have been reported; • One or more primary outcomes is reported using measurements, analysis methods or subsets of the data (e.g. subscales) that were not pre-specified; • One or more reported primary outcomes were not pre-specified (unless clear justification for their reporting is provided, such as an unexpected adverse effect); • One or more outcomes of interest in the review are reported incompletely so that they cannot be entered in a meta-analysis; • The study report fails to include results for a key outcome that would be expected to have been reported for such a study.
Criteria for the judgement of 'Unclear risk' of bias.	Insufficient information to permit judgement of 'Low risk' or 'High risk'. It is likely that the majority of studies will fall into this category.
[7]**TREATMENT IMPLENTATION** **Performance bias due to deviations from intended interventions**	
Criteria for a judgement of 'Low risk' of bias.	The study appears to be free of other sources of bias.
Criteria for the judgement of 'High risk' of bias.	• Participants, carers or personnel were aware of intervention groups and there were deviations from intended interventions that were unbalanced between the intervention groups and likely to have affected the outcome
Criteria for the judgement of 'Unclear risk' of bias.	There may be a risk of bias, but there is either: • Insufficient information about treatment implementation
Low risk' of bias.	• Participants, carers or personnel were aware of intervention groups during the trial but any deviations from intended intervention reflected usual practice

[7]Taken from Mundar & Barth, 2017. The Cochrane handbook definition for treatment integrity is rather inclusive and includes treatment adherence, treatment dose, quality of delivery (e.g.,"implementer enthusiasm, training of implementers"), participant responsiveness (e.g., "levels of participation and enthusiasm"), and program differentiation (Chapter 7.3.4.1, Higgins & Green, 2011)

Appendix F: Further Criteria for Deviations from Intended Interventions

Low Risk of Bias	Participants, carers and people delivering the interventions were unaware of intervention groups during the trial **OR** Participants, carers or people delivering the interventions were aware of intervention groups **AND**The important co-interventions were balanced across intervention groups **AND**Failures in implementing the intervention could not have affected the outcome (achieved if implementation was successful for most participants) **AND**Study participants adhered to the assigned intervention regimen
Unclear Risk of Bias	Participants, carers and people delivering the interventions were unaware of intervention groups during thetrial **AND**Failures in implementing the intervention couldhave affected the outcome ORStudy participants did not adhere to the assignedintervention regimen **OR**Participants, carers or people delivering the interventions were aware of intervention groups **AND**The important co-interventions were balanced acrossintervention groups **AND**Failures in implementing the intervention couldhave affected the outcome **OR** Study participants did not adhere to the assignedintervention regimen **OR** Participants, carers or people delivering the

	interventions were aware of intervention groups **AND** The important co-interventions were not balanced across intervention groups
High Risk of Bias	Participants, carers and people delivering the interventions were unaware of intervention groups during the trial **AND** Failures in implementing the intervention could have affected the outcome **OR** Study participants did not adhere to the assigned intervention regimen **OR** Participants, carers or people delivering the interventions were aware of intervention groups **AND** The important co-interventions were balanced across intervention groups **AND** Failures in implementing the intervention could have affected the outcome OR Study participants did not adhere to the assigned intervention regimen **OR** Participants, carers or people delivering the interventions were aware of intervention groups ANDThe important co-interventions were not balanced across intervention groups **AND** An appropriate analysis was not used to estimate the effect ofadhering to the intervention

Appendix G: The Mental Health Continuum – Short Form (Keyes, 2002)

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						
4. that you had something important to contribute to society						
5. that you belonged to a community (like a social group, or your neighborhood)						
6. that our society is becoming a better place for people like you						
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						

Appendix H: The Valued Living Questionnaire (Wilson et al, 2010)

Valued Living Questionnaire
Part 1: Importance

Below are areas of life that are valued by some people. This questionnaire will help clarify your own quality-of-life in each of these areas. One aspect of quality-of-life involves the importance you put on different areas of living. Rate the importance of each area (by circling a number) on a scale of 1-10. A "1" means that area is *not at all important*. A "10" means that area is *very important*. Not everyone will value all of these areas, or value all areas the same. Rate each area according to **your own personal sense of importance**.

Area:	**not at all important**									**extremely important**
1) Family (other than marriage or parenting)	1	2	3	4	5	6	7	8	9	10
2) Marriage/couples/ intimate relationships	1	2	3	4	5	6	7	8	9	10
3) Parenting	1	2	3	4	5	6	7	8	9	10
4) Friends/social life	1	2	3	4	5	6	7	8	9	10
5) Work	1	2	3	4	5	6	7	8	9	10
6) Education/training	1	2	3	4	5	6	7	8	9	10
7) Recreation/fun	1	2	3	4	5	6	7	8	9	10
8) Spirituality/meaning & purpose in life	1	2	3	4	5	6	7	8	9	10
9) Citizenship/ Community Life	1	2	3	4	5	6	7	8	9	10
10) Physical self-care (nutrition, exercise/ movement, rest/sleep)	1	2	3	4	5	6	7	8	9	10

Valued Living Questionnaire
Part 2: Consistency

In this section, please give a rating of how **consistent** your actions have been with each of your values. Please note that this is **not** asking about your ideal in each area, **nor** what others think of you. Everyone does better in some areas than in others. People also do better at some times than at others. **Please just indicate how you think you have been doing during the past week.** Rate each area (by circling a number) on a scale of 1-10. A "1" means that your actions have been *completely inconsistent with your value*. A "10" means that your actions have been *completely consistent with your value*.

During the past week…

Area:not at all consistent with my value										**completely consistent with my value**
1) Family (other than marriage or parenting)	1	2	3	4	5	6	7	8	9	10
2) Marriage/couples/ intimate relationships	1	2	3	4	5	6	7	8	9	10
3) Parenting	1	2	3	4	5	6	7	8	9	10
4) Friends/social life	1	2	3	4	5	6	7	8	9	10
5) Work	1	2	3	4	5	6	7	8	9	10
6) Education/training	1	2	3	4	5	6	7	8	9	10
7) Recreation/fun	1	2	3	4	5	6	7	8	9	10
8) Spirituality/meaning & purpose in life	1	2	3	4	5	6	7	8	9	10
9) Citizenship/ Community Life	1	2	3	4	5	6	7	8	9	10
10) Physical self-care (nutrition, exercise/ movement, rest/sleep)	1	2	3	4	5	6	7	8	9	10

Appendix I: Short General Health Questionnaire (GHQ 12) (Goldberg et al., 1997)

Have you recently?

1.	Been able to concentrate on what you're doing?	Better than usual	Same as usual	Less than usual	Much less than usual
2.	Lost much sleep over worry?	Not at all	No more than usual	Rather more than usual	Much more than usual
3.	Felt you were playing a useful part in things?	More so than usual	Same as usual	Less useful than usual	Much less useful
4.	Felt capable of making decisions about things?	More so than usual	Same as usual	Less so than usual	Much less capable
5.	Felt constantly under strain?	Not at all	No more than usual	Rather more than usual	Much more than usual
6.	Felt you couldn't overcome your difficulties?	Not at all	No more than usual	Rather more than usual	Much more than usual
7.	Been able to enjoy your normal day-to-day activities?	More so than usual	Same as usual	Less so than usual	Much less than usual
8.	Been able to face up to your problems?	More so than usual	Same as usual	Less so than usual	Much less able
9.	Been feeling unhappy and depressed?	Not at all	No more than usual	Rather more than usual	Much more than usual
10.	Been losing confidence in yourself?	Not at all	No more than usual	Rather more than usual	Much more than usual
11.	Been thinking of yourself as a worthless person?	Not at all	No more than usual	Rather more than usual	Much more than usual
12.	Been feeling reasonably happy, all things considered	More so than usual	About same as usual	Less so than usual	Much less than usual.

Appendix J: The Frost Multidimensional Perfectionism Sub-scales (Frost et al., 1990)

Concerns over mistakes subscale

1. If I fail at work/school, I am a failure as a person.
2. I should be upset if I make a mistake.
3. If someone does a task at work/school better than I, then I feel like I failed the whole task.
4. If I fail partly, it is as bad as being a complete failure.
5. I hate being less than the best at things.
6. People will probably think less of me if I make a mistake.
7. If I do not do as well as other people, it means I am an inferior human being.
8. If I do not do well all the time, people will not respect me.
9. The fewer mistakes I make, the more people will like me.

Doubts about actions subscale

1. Even when I do something very carefully, I often feel that it is not quite right.
2. I usually have doubts about the simple everyday things I do.
3. I tend to get behind in my work because I repeat things over and over.
4. It takes me a long time to do something “right”.

Response Scale:

1 = Strongly Disagree

2 = Disagree

3 = Neither Agree Nor Disagree

4 = Agree

5 = Strongly Agree

Appendix K: The Forms of Self-Criticising/Attacking Sub-scales (Gilbert et al, 2004)

*Items from the Hated Self (HS) and Inadequate Self (IS) subscales

SCALE (FSCRS) When things go wrong in our lives or don't work out as we hoped, and we feel we could have done better, we sometimes have negative and self-critical thoughts and feelings. These may take the form of feeling worthless, useless or inferior etc. However, people can also try to be supportive of them selves. Below are a series of thoughts and feelings that people sometimes have. Read each statement carefully and circle the number that best describes how much each statement is true for you.

Please use the scale below.

Not at all like me 0

A little bit like me 1

Moderately like me 2

Quite a bit like me 3

Extremely like me 4

1. I am easily disappointed with myself. 0 1 2 3 4 (IS)
2. There is a part of me that puts me down. 0 1 2 3 4 (IS)
3. I find it difficult to control my anger and frustration at myself. 0 1 2 3 4 (IS)
4. There is a part of me that feels I am not good enough. 0 1 2 3 4 (IS)
5. I feel beaten down by my own self-critical thoughts. 0 1 2 3 4 (IS)
6. I have become so angry with myself that I want to hurt or injure myself. 0 1 2 3 4 (HS)
7. I have a sense of disgust with myself. 0 1 2 3 4 (HS)
8. I stop caring about myself. 0 1 2 3 4 (HS)
9. I remember and dwell on my failings. 0 1 2 3 4 (IS)
10. I call myself names. 0 1 2 3 4 (HS)
11. I can't accept failures and setbacks without feeling inadequate. 0 1 2 3 4 (IS)
12. I think I deserve my self-criticism. 0 1 2 3 4 (IS)
13. There is a part of me that wants to get rid of the bits I don't like. 0 1 2 3 4 (IS)
14. I do not like being me. 0 1 2 3 4 (HS)

Appendix L: The Acceptance and Action Questionnaire II (Bond et al., 2011)

AAQ-II

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

1.	My painful experiences and memories make it difficult for me to live a life that I would value.	1	2	3	4	5	6	7
2.	I'm afraid of my feelings.	1	2	3	4	5	6	7
3.	I worry about not being able to control my worries and feelings.	1	2	3	4	5	6	7
4.	My painful memories prevent me from having a fulfilling life.	1	2	3	4	5	6	7
5.	Emotions cause problems in my life.	1	2	3	4	5	6	7
6.	It seems like most people are handling their lives better than I am.	1	2	3	4	5	6	7
7.	Worries get in the way of my success.	1	2	3	4	5	6	7

Appendix M: The Flexibility of Responses to Self-critical Thoughts Scale (White et al., *in press*)

1	2	3	4	5	6	7
never true	very seldom true	seldom true	sometimes true	frequently true	almost always true	always true

When I have a critical thought about myself….

1.	….It makes me lose control of my behaviour	1	2	3	4	5	6	7
2.	….I do things I later regret	1	2	3	4	5	6	7
3.	….I feel so disgusted at myself that I don't act the way I should	1	2	3	4	5	6	7
4.	….I feel so ashamed that I don't act the way I should	1	2	3	4	5	6	7
5.	….I don't treat others the way I would like	1	2	3	4	5	6	7
6.	….I act in a way that makes life more difficult for me	1	2	3	4	5	6	7
7.	….I don't treat myself the way I would like	1	2	3	4	5	6	7
8.	….It gets me so down that I don't act the way I should	1	2	3	4	5	6	7
9.	….I try to ignore it	1	2	3	4	5	6	7
10.	….I try not to think about it	1	2	3	4	5	6	7
11.	….I try to block out any feelings it creates	1	2	3	4	5	6	7
12.	….I pretend it's not there	1	2	3	4	5	6	7

Appendix N: Ethical Approval Letter

Health and Life Sciences Research Ethics Committee (Psychology, Health and Society)

6 March 2018

Dear Dr White

I am pleased to inform you that your application for research ethics approval has been approved. Application details and conditions of approval can be found below. Appendix A contains a list of documents approved by the Committee.

Application Details

Reference:	3075
Project Title:	Exploring Acceptance and Commitment Processes as Predictors of Subjective Wellbeing in Student Practitioners
Principal Investigator/Supervisor:	Dr Ross White
Co-Investigator(s):	Miss Alexandra Stenhoff, Dr Linda Steadman, Dr James Reilly
Lead Student Investigator:	-
Department:	Psychological Sciences
Approval Date:	06/03/2018
Approval Expiry Date:	Five years from the approval date listed above

The application was **APPROVED** subject to the following conditions:

Conditions of approval

- All serious adverse events must be reported via the Research Integrity and Ethics Team (ethics@liverpool.ac.uk) within 24 hours of their occurrence.
- If you wish to extend the duration of the study beyond the research ethics approval expiry date listed above, a new application should be submitted.
- If you wish to make an amendment to the research, please create and submit an amendment form using the research ethics system.
- If the named Principal Investigator or Supervisor leaves the employment of the University during the course of this approval, the approval will lapse. Therefore it will be necessary to create and submit an amendment form using the research ethics system.
- It is the responsibility of the Principal Investigator/Supervisor to inform all the investigators of the terms of the approval.

Kind regards,

Health and Life Sciences Research Ethics Committee (Psychology, Health and Society)

iphsrec@liverpool.ac.uk

0151 795 5420

Appendix - Approved Documents

Appendix O: Participant Information Sheet

Improving mental wellbeing in student practitioners

You are being invited to participate in a research study (Exploring Subjective Wellbeing in Student Practitioners). Before you decide whether to participate, it is important for you to understand why the research is being conducted and what it will involve. Please take time to read the following information carefully and feel free to ask us if you would like more information or if there is anything that you do not understand. Please also feel free to discuss this with your friends and relatives if you wish. We would like to stress that you do not have to accept this invitation and should only agree to take part if you want to.

Why are we conducting this research?

We are interested in identifying factors that might predict mental health and well-being in current student practitioners studying at The University of Liverpool. We hope that findings from this research will help inform the development of psychological interventions aimed at enhancing students' mental health and wellbeing.

Who is being asked to take part?

We are asking student practitioners currently studying at The University of Liverpool. In this study Student Practitioners are classed as students working towards a professional qualification on the following undergraduate courses: medicine, clinical psychology, nursing, veterinary sciences, physiotherapy, occupational therapy, orthoptics, radiotherapy, radiography, or dentistry.

Do I have to take part?

You do not have to take part in this study. If you decide to participate, you are free to withdraw from the study at any time without explanation. However, because the information that you provide is anonymous it will not be possible for us to delete your data.

Appendix P: Participant Consent Form

Improving mental wellbeing in student practitioners

1. I confirm that I have read and have understood the Participant Information Sheet (version 1.1: 24/02/2018) for the above study. I have had the opportunity to consider the information, ask questions and have these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw from the study at any time without giving any reason.

3. I understand that I am not required to provide any identifiable information and that my questionnaire responses will be processed anonymously and confidentially.

I agree to take part in this research study

Date:

Future research opportunities

I would like to receive emails from the research team informing me of future research opportunities.

If yes = Please enter your email address.

No

Appendix Q: University Characteristics and Degree Program Enrolment

University Characteristics	Total *n* (%)
Enrolment Status	
Home (UK) Student	260 (94.9%)
EU student	6 (2.2%)
International Student	8 (2.9%)
Degree Program	
Medicine and surgery MBChB	103 (37.6%)
Nursing BN	10 (3.6%)
Diagnostic Radiography BSc	7 (2.6%)
Occupational therapy BSc	5 (1.8%)
Orthoptics BSc	7 (2.6%)
Physiotherapy BSc	3 (1.1%)
Radiotherapy BSc	8 (2.9%)
Dental surgery BDS	36 (13.1%)
Veterinary Conservation BSc	1 (.4%)
Veterinary Science BVSc	62 (22.6%)
Clinical Psychology DClin	29 (10.6%)
Other	3 (1.1%)
Year of Studies	
1st Year	57 (20.8)
2nd Year	75 (27.4)
3rd Year	76 (27.7)
4th Year	31 (11.3)
5th Year	35 (12.8)