

**Exploring the effects of a values-based micro-intervention for social media  
use on emerging adults: a randomised controlled trial**

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## **UCL Doctorate in Clinical Psychology**

### **Thesis declaration form**

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signature:

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## Overview

This thesis explores the effects of a values-based micro-intervention for social media use (SMU) on emerging adults and is divided into three parts.

Part one of this thesis is a systematic review. It identifies and explores the features and effectiveness of psychological interventions that incorporate the active use of social media (SM) as a tool to improve depression and/or anxiety.

Part two is an empirical paper, which assesses the immediate and sustained (from one week follow-up) effects of a values-based micro-intervention for SMU on emerging adults' positive evaluation of SMU, online values-consistent behaviour, affective states, general wellbeing, and levels of social connectedness. It also describes the findings from secondary analyses to explore reason for null findings. This study is an extension of projects from two previous trainees (Taylor, 2023; Thomson, 2023). The contributions of the authors are summarised in Appendix D.

Part three is a critical appraisal of the process of undertaking the systematic review and the empirical paper. It discusses the professional and personal challenges encountered throughout the research process and shares insights gained from both research and clinical viewpoints.

## Impact Statement

Social media use (SMU) has grown tremendously over the years, with 4.59 billion people using at least one social media (SM) platform (Statista, 2022), and 90% of emerging adults (18-29 year olds) engaging with at least one SM platform daily (Pew Research Centre, 2018). Research indicates that SMU can have both positive and negative effects on psychosocial outcomes (Yang et al., 2021).

Understanding the effectiveness of existing interventions that target the nature of SMU and their impact on psychosocial outcomes is crucial for developing SMU interventions aimed at promoting wellbeing and understanding underlying mechanisms of change.

The systematic review identified and explored the features and effectiveness of 23 psychological interventions that incorporated *active* SMU to improve depression and/or anxiety across all ages in clinical and non-clinical samples. Nine studies employed purpose-built networks, whilst the rest utilised existing platforms such as Facebook, WhatsApp, WeChat, and QQ. Participants mainly engaged in activities such as generating their own posts, participating in group discussions, commenting on researcher or peer-generated posts, and private messaging other users. The findings suggest that incorporating active SMU in interventions could potentially improve depression and anxiety outcomes across various age groups and conditions, with depression showing more frequent improvements. The review highlights the need for clearer and more consistent reporting of participant engagement with the intervention and emphasises greater methodological rigour in studying the effectiveness of SMU-based interventions to enhance mental health.

The empirical paper evaluated the immediate and sustained effects of a values-based micro-intervention for SMU on emerging adults' SMU, values-consistent behaviour and psychosocial outcomes, and explored reasons for null findings. This study represents a novel exploration into the effects of an intervention focusing on the positive aspects of SMU in individuals without problematic SMU behaviours, grounded in Acceptance and Commitment (ACT) theory. This approach represents

an original contribution to the literature, which has traditionally focused on interventions addressing problematic SMU.

Both papers highlight the need for a nuanced understanding of the relationship between SMU and psychosocial outcomes. They emphasise the importance of considering how users interact with SM, rather than merely focusing on the quantity of use. These findings hold implications across different domains.

Clinically, the findings underscore the need for clinicians to routinely inquire about individuals' patterns of SMU. Research indicates that passive SMU, interactions with weak ties, and motives tied to compensation can adversely affect mental health and psychosocial outcomes (Tibber & Silver, 2022; Yang et al., 2021). To mitigate these negative impacts, clinicians can implement psychoeducational and cognitive strategies. Additionally, these insights are relevant for educational contexts, influencing curriculum development and interventions aimed at promoting positive SMU habits.

The plan is to disseminate the findings of the empirical paper by publishing the work in a peer-reviewed journal.

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## **Part One: Literature Review**

A systematic review of psychological interventions that incorporate the active use of social media as a tool to improve depression and/or anxiety

## Abstract

**Aims:** Building on the understanding that how we use social media (SM) can have a significant impact on our wellbeing, this review aimed to achieve two objectives. Firstly, it sought to identify and explore the nature of interventions designed to improve mental health outcomes, which intentionally incorporate some form of *active* use of SM as part of the intervention. Secondly, to explore the potential of these interventions to improve symptoms of depression and anxiety in individuals across all ages.

**Methods:** A systematic search of PsycInfo, Medline and Web of Science databases was performed to identify relevant studies published between 1997 to October 2023. Additional papers were sought by screening the reference lists of key papers. Included outcomes related to a pre-post assessment of depression and/or anxiety using validated measures. A narrative synthesis without meta-analysis was the chosen approach to address the aims of the review.

**Results:** Amongst the 6215 references identified, 23 articles published between 2015 and 2023 met the full eligibility criteria and were included in the review. Nine studies employed purpose-built networks whilst the remainder utilised existing SM brands (Facebook, WhatsApp, WeChat, QQ) as platforms for active SM use. Participants mostly used SM platforms to generate their own posts, engage in group discussions, comment on researcher/peer-generated posts and private message other users. In 70% (16/23) of studies, significant improvements were found in depressive symptoms, and 58% (7/12) of studies for anxiety symptoms. The remaining studies observed no change in these symptoms.

**Conclusions:** These results suggest that interventions that intentionally incorporate elements of *active* SM use may have the potential to improve depression and anxiety outcomes across age groups and presentations, with more frequent improvements observed for depression The

interventions varied significantly in their approaches, including differences in the types of SM platforms used, the nature of user engagement (e.g. active content creation, commenting, reacting), the level of peer or professional support, and the presence of behaviour change techniques (e.g. cognitive-behavioural techniques). Further research is needed with consistent reporting of engagement and description of SM features using larger, more representative samples to enhance the quality of findings.

## **Introduction**

Since 2007, rates of mental health (MH) problems have been rapidly increasing in the UK across all age groups (Health & Social Care Information Centre, 2020). This is particularly steep amongst adolescents and young adults (AYA) where an estimated 18% of children aged 7 to 16 years and 22% of 17 to 24 year olds have a probable MH problem (NHS Digital, 2022). Depression and anxiety disorders remain the most experienced MH problems globally (Institute of Health Metrics and Evaluation, 2022). At the same time, we have seen a large increase in social media (SM) use from the launch of the first social networking site 'SixDegrees' in 1997 (Boyd & Ellison, 2007). It is believed that 4.59 billion people worldwide use at least one SM platform (Statista, 2022), with the heaviest users being Generation Z, who spend an average of 2.7 hours per day on SM (GlobalWebIndex, 2020).

### **Amount of social media use on mental health**

SM is categorised as an online space that allows users to dynamically interact with each other and exchange user-generated content (e.g. information, private message, ideas, images) in real time (McKeon et al., 2022). This includes platforms such as Facebook, WhatsApp, YouTube as well as online blogs and other virtual interactive platforms. SM has transformed the way in which individuals relate to one another, and share and process information, sparking increased interest in the way SM use can affect MH (Brevers & Turel, 2019).

It has been suggested that the rise in MH difficulties amongst AYA is partially explained by the increased use of SM (Twenge et al., 2018). This notion is consistent with meta-analyses and systematic reviews showing consistent positive, yet weak, associations between amount of SM use and MH difficulties, including depression, anxiety, and distress (Abi-Jaoude et al., 2020; Keles et al.,



2019; McCrae et al., 2017; Orben, 2020a). However, much of this research is cross-sectional in nature, making it difficult to establish causality and understand the direction of these relationships.

Other meta-analyses and systematic reviews have explored the impact of interventions targeted at reducing SM on MH. For example, a meta-analysis of 16 studies showed that psychological treatments for reducing SM use, particularly ones based on a cognitive-behavioural approach, were effective at reducing SM usage and depressive symptoms in individuals with internet addiction (Winkler et al., 2013). However, Plackett et al. (2023) conducted a systematic review on the impact of SM use interventions (which target the *amount* of SM use) on mental wellbeing in adults, which revealed mixed findings. Therapy-based interventions (e.g. CBT-based) were more effective at improving MH (83% of studies) compared with interventions involving simply limiting SM use (20%) or full abstinence (25%). Significant improvements in depression were shown across 70% of reported studies. Taken together, these findings suggest that more time spent on SM may be related to poorer MH; however, abstaining from SM use may not necessarily lead to improved MH either. It is possible that therapy-based interventions may offer greater benefits because they encourage individuals to reflect on *how* they engage with SM, rather than solely focusing on reducing usage.

### **Mental health interventions delivered online**

Existing research has tended to adopt a “causationist” approach, viewing SM as being inherently harmful or helpful, as well as being “concern-centric”, largely focusing on the harms of using SM (Orben et al., 2020b). However, amidst society’s growing reliance on technological devices and the mixed evidence around the effectiveness of SM abstinence on improving MH, there may be value for healthcare providers to harness some of the benefits of the virtual nature of SM and utilise these to support the MH of SM users.

In addition to the many noted risks of SMU, there may be a number of potential benefits. For example, SM engagement can offer opportunities for social communication, peer support, access to

advice, and MH resources (Subrahmanyam & Šmahel, 2011a; Subrahmanyam & Šmahel, 2011b). Moreover, given the widely accessible and popular nature of digital tools, such as smartphones, applications and SM platforms, traditional MH interventions (e.g. manualised CBT) have started to be delivered on these formats (Okocha et al., 2022). Digital MH interventions have been largely delivered to young samples across MH conditions, and its efficacy and feasibility have been supported by various reviews (e.g. Garrido et al., 2019; Kruzan et al., 2022; Lattie et al., 2019).

Using SM as the tool to deliver psychological treatments has several potential advantages over traditional face-to-face therapy. For example, SM-based treatments may increase access to MH support for individuals who may require more flexibility than face-to-face interventions typically allow, given the 24-hour accessibility of most of these interventions. They also have the capacity to attract and retain engagement of participants due to the lack of geographical constraints (Marchant et al., 2017). Online interventions may also feel more seamless, especially to AYA, who already largely incorporate SM use as part of their daily activity, thus can drive further engagement of these formats of MH support (Ridout & Campbell, 2018; Valentine et al., 2019). Finally, the greater opportunities for anonymity and privacy from many online interventions can overcome the barriers commonly reported amongst highly stigmatised individuals, such as individuals with HIV or psychosis (Alvarez-Jiménez et al., 2012; Dixon et al., 2016).

Taken together, the evidence suggests that the concern-centric narrative surrounding SM use, with a focus on the *quantity* of use, is overly simplistic and fails to acknowledge the potential benefits that SM platforms can offer for MH. This further emphasises the need to explore some of the features of actual SM use that is related to improved MH. This would help inform the development of SM-based interventions that can be utilised to support the wellbeing of its users.

### **Active versus passive social media use**

One potential explanation for the mixed findings in relation to SM use and MH lies in *how* people use SM, rather than purely *how much*. One dimension of use that has received a great deal of research attention is active versus passive engagement with SM. Active use denotes the production or sharing of SM content, and can be interactive (e.g. conversing with others, commenting on posts) or non-interactive (e.g. uploading a status/picture/story). In contrast, passive use is when content is consumed rather than produced, e.g. browsing the Facebook newsfeed (Hancock et al., 2019).

Whilst passive SM use has been linked to poorer wellbeing in AYA, including greater depression and anxiety severity (Frison & Eggermont, 2017; Thorisdottir et al., 2019), active use has been related to more positive emotions after SM use, greater self-esteem and feelings of closeness (Subrahmanyam et al., 2020). Research also suggests reduced anxiety and depressive symptoms over time following active use of Facebook (Escobar-Viera et al., 2018; Thorisdottir et al., 2019).

The benefits to MH in relation to active SM use may be partly attributed to emotional self-disclosure, which has been found to correlate negatively with loneliness and depression (Laurenceau et al., 1998). A review by Clark et al. (2018) emphasised an association between more interactive patterns of SM use, for instance, through self-disclosure and communication with other users, to improved MH through greater levels of social capital and connectedness. Rimé (2009) argues that humans tend to share emotional experiences with others; this can be facilitated and transformed in different ways on SM, e.g. through sharing statuses, commenting, 'liking' and 'sharing' content, which in turn can have positive effects on wellbeing including positive affect, social connectedness and self-efficacy (Bazarova et al., 2015; Choi & Toma, 2014).

There is evidence to suggest that SM-based interventions not only appeal to individuals with MH difficulties (Alvarez-Jiménez et al., 2012; Dixon et al., 2016; Doyle et al., 2014), but also to individuals with physical health conditions. For example, the primary motivator of online intervention

participation in cancer survivors is socially connecting to peers (Gorlick & Bantum, 2014). Similarly, online peer support groups with or without psychological intervention elements can improve the wellbeing of individuals with chronic pain (Bender et al., 2011). Social cognitive theories suggest that supportive peer networks including individuals with successful management of the same illness can enhance coping (Bandura, 1997; Brownson & Heisler, 2009; Cobb, 1976).

### **The need for a systematic review**

To help tackle the rising rates of MH difficulties (Health & Social Care Information Centre, 2020), there is potential for interventions to harness the benefits that come with active use of SM as evidenced by research. This could help promote MH in an engaging yet time- and cost-effective way (Griffiths et al., 2006; Proudfoot et al., 2012). Existing reviews have identified interventions hosted on SM in AYA, which involve both active and passive use (e.g. Kruzan et al., 2022), and investigated the impact of interventions adjusting amount of SM use on MH (e.g. Plackett et al., 2023). However, to the best of the author's knowledge, no review exists to explore what interventions are available that include the intentional *active* engagement of SM in participants, nor the effectiveness of such interventions across all ages. By identifying and exploring the nature of these interventions, this can open avenues for future research to explore more nuanced explanations about the causes of any MH effects from SM-based interventions. This could also pave the way for their use in public health or MH treatment.

### **Aims**

This review had two over-arching aims:

1. To identify and explore the nature of interventions aimed at improving MH outcomes in individuals across all ages, which intentionally incorporate some form of *active* engagement of SM as part of the intervention.

2. To explore the potential of these interventions to improve depression and anxiety symptoms.

Depression and anxiety symptoms were adopted for MH in this review as these are the two most commonly reported MH difficulties (IHME, 2022). This review also aimed to address gaps in the existing literature and inform future research work in this area.

### **Defining interventions with active social media use**

For the purpose of this review, 'SM' was defined broadly as a virtual community space that allows for community interaction and the exchange of user-generated information between users (e.g. online discussion boards, blogging forums, social networking sites, messaging applications) (McKeon et al., 2022). 'Active use' was defined as when SM content is produced or shared (either in an interactive or non-interactive way) (Hancock et al., 2019). Interventions were limited to those that intentionally encouraged *active* use of SM, including user-to-user contact.

## **Methods**

This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Liberati et al., 2009). The narrative synthesis approach was selected to allow for a more nuanced understanding of the interventions' potential to improve depression and/or anxiety outcomes across varied populations and methodologies. This method was deemed more appropriate than a meta-analysis, which would have likely obscured distinctions between *active* and general SM use, making it difficult to determine the unique role of active engagement in driving MH outcomes (Baumeister, 2013). Given the substantial heterogeneity in SM platforms, engagement methods, and intervention features across studies, a meta-analysis could have led to overly generalised

conclusions, potentially overlooking critical aspects of *active* SM use and reducing the interpretive value of findings on this specific form of SM interaction (Sharpe, 1997).

### **Search strategy**

Relevant articles were identified through a systematic literature search on PsycInfo, Medline and Web of Science from 1997 to 12<sup>th</sup> October 2023. Additional papers were sought through screening the reference lists of key papers. The year 1997 was chosen due to the launch of the first social networking site 'SixDegrees' that year (Boyd & Ellison, 2007).

The search included two main concepts: 1) a combined SM and intervention concept, and 2) a depression/anxiety concept. To help inform the search terms for these two concepts, search terms included in similar review papers were sought (Kruzan et al., 2022; Plackett et al., 2023). A range of synonyms, Boolean search operators and subject headings were utilised based on the requirements of each database. The first concept excluded "gaming" from the search results due to the definition of SM adopted for this review. The search strings also excluded "cross-sectional" studies from search results to minimise the occurrence of non-intervention studies. A combination of filters and the Boolean "NOT" command were used to limit the search to peer-reviewed journals only. See Appendix A for the full search terms.

### **Eligibility criteria**

Studies were deemed suitable for inclusion if the following criteria were met: (i) the intervention intentionally encouraged *active* use of SM, either as the full intervention or as part of an intervention (including user-to-user contact), (ii) validated measures of depression and/or anxiety were used, (iii) the primary or secondary aim of the study was to assess the effectiveness of the intervention on improving or preventing MH outcomes, and (iv) the study was published in a peer-

reviewed journal.

Consistent with the definition of *active* SM use adopted for this review, studies were excluded for the following reasons: (i) if the intervention did not encourage active SM use (e.g. passively scrolling on SM without producing, sharing, or 'liking'/reacting to any content), (ii) online interventions that lack any interactive element from the study participants, e.g. one-way interactions from chatbots/moderators to participants, (iii) interventions that purely focus on manipulating screen time/time spent on social media, and (iv) gaming-based interventions. In addition, studies with no pre-post assessment of depression and/or anxiety were excluded, as were studies that analysed secondary data derived from other included studies to avoid duplication of findings. See Table 1 for the full list of inclusion and exclusion criteria that were applied.

**Table 1***Inclusion and exclusion criteria*

Criterion	Inclusion	Exclusion
Time period	<ul style="list-style-type: none"> <li>• 1997-present (October 2023)</li> </ul>	
Publication type	<ul style="list-style-type: none"> <li>• Peer-reviewed journals</li> <li>• Original research articles</li> </ul>	<ul style="list-style-type: none"> <li>• Research protocols, editorials, review articles, pharmacological studies, book chapters, theoretical articles, studies involving secondary data analysis</li> </ul>
Population	<ul style="list-style-type: none"> <li>• All ages</li> <li>• Clinical and/or non-clinical samples</li> </ul>	
Intervention	<ul style="list-style-type: none"> <li>• Intervention intentionally encourages <i>active</i> use of social media, either as the full intervention or as part of an intervention (includes user-to-user contact). E.g. participants are encouraged to converse with others or produce/share/react to content (interactive) or upload a status/picture (non-interactive)</li> </ul>	<ul style="list-style-type: none"> <li>• Interventions that do not encourage active social media use (e.g. passive scrolling)</li> <li>• Online programmes that lack any interactive element from the study participants, e.g. one-way interactions from chatbots/moderators to participants</li> <li>• Interventions that purely focus on manipulating screen time/time spent on social media</li> <li>• Gaming-based interventions</li> </ul>
Study aim	<ul style="list-style-type: none"> <li>• Primary/secondary aim was to assess the effectiveness of the intervention on improving mental health outcomes</li> </ul>	
Study design	<ul style="list-style-type: none"> <li>• Randomised controlled trials</li> <li>• Quasi-experimental designs</li> <li>• Pre-post studies</li> </ul>	<ul style="list-style-type: none"> <li>• Non-intervention studies (e.g. observational studies)</li> <li>• Cross-sectional studies</li> <li>• Purely qualitative studies</li> </ul>
Outcome	<ul style="list-style-type: none"> <li>• Pre-post measures of depression and/or anxiety</li> <li>• Validated measure of depression symptoms used</li> <li>• Validated measure of anxiety symptoms used</li> </ul>	



## **The screening process and data extraction**

The systematic review software Covidence and reference manager Endnote were used to remove duplicates and manage the screening process, which consisted of two stages. For the first stage, titles and abstracts were screened by the author to establish basic relevance including a focus on interventions utilising SM, and MH. In the second stage, full-texts of eligible papers were read in order to identify papers that met the inclusion criteria defined above. The author conducted the full-text screening, of which 10% of papers were cross-checked for accuracy by an independent reviewer (CJ).

Extracted data were recorded on an Excel spreadsheet and included information on the country of origin, study design, sample size, population studied, intervention components, description of comparison groups, depression/anxiety measures used and outcomes (see Tables 2 and 3).

The extraction of >10% of the full-text articles (3/23) and quality assessment of articles (see below) were checked by independent reviewer CJ to ensure accuracy and consistency. Disagreements were resolved via discussion.

Where data were not specified in a study, authors were contacted via email to source this data, e.g. mean age of participants or sample size per group. After two weeks, a follow-up email was sent to authors who had not responded. Study data were deemed as 'not reported' after an additional four weeks with no response from study authors.

## **Quality Assessment**

The well-established Methodological Quality Scale (MQS) for intervention studies (Chácon-Moscoso et al., 2023) was used to evaluate the quality of the eligible studies. This checklist was chosen for its high reliability and comprehensiveness and is consistent with the Centre for Reviews and

Dissemination (2009) guidance. A checklist was chosen over a measure consisting of a 'total quality score' as checklists allow the provision of more detailed information about the individual dimensions of the quality assessment compared with a single numerical value of the 'study quality' (Boland et al., 2014).

The MQS was first developed by Chácon-Moscoso et al. (2016) who systematically reviewed published methodological quality assessment tools from which they concluded several key domains which form the basis of the MQS (Chácon-Moscoso et al., 2023). The MQS consists of ten items, each representing a methodological feature: (i) inclusion/exclusion criteria, (ii) attrition, (iii) attrition between groups, (iv) imputation of missing data, (v) methodology/design, (vi) follow-up, (vii) occasions of measurements, (viii) control techniques, (ix) dependent variable standardization and (x) construct definition. The items pertained to three measures of validity: external, internal and construct.

Each study was assessed independently on the robustness of each item/criteria (<0.5 = low, 0.50-0.75 = medium, >0.75 = high). An additional option of "9" was available for item 3 ('attrition between groups'), which signified 'not applicable' where there was no cross-group comparison.

For each study, the *external* validity score was derived from summing the scores across items 1-4 and dividing by four. If item 3 was 'not applicable', then the external validity score was derived from summing the scores for items 1, 2 and 4 and dividing by *three*. The *internal* validity score was calculated by summing the scores for items 5-8 and dividing by four. Finally, *construct* validity was derived from the summation of scores for items 9-10 and dividing by two. Like the interpretation for scoring individual items, each type of validity was interpreted as follows: <0.5 = low, 0.50-0.75 = medium, >0.75 = high. Thus, each study was given an overall low/medium/high rating for each assessment of validity.

Articles were not excluded based on their study quality; instead, results were interpreted in light of these limitations. See Appendix B for the coding manual.

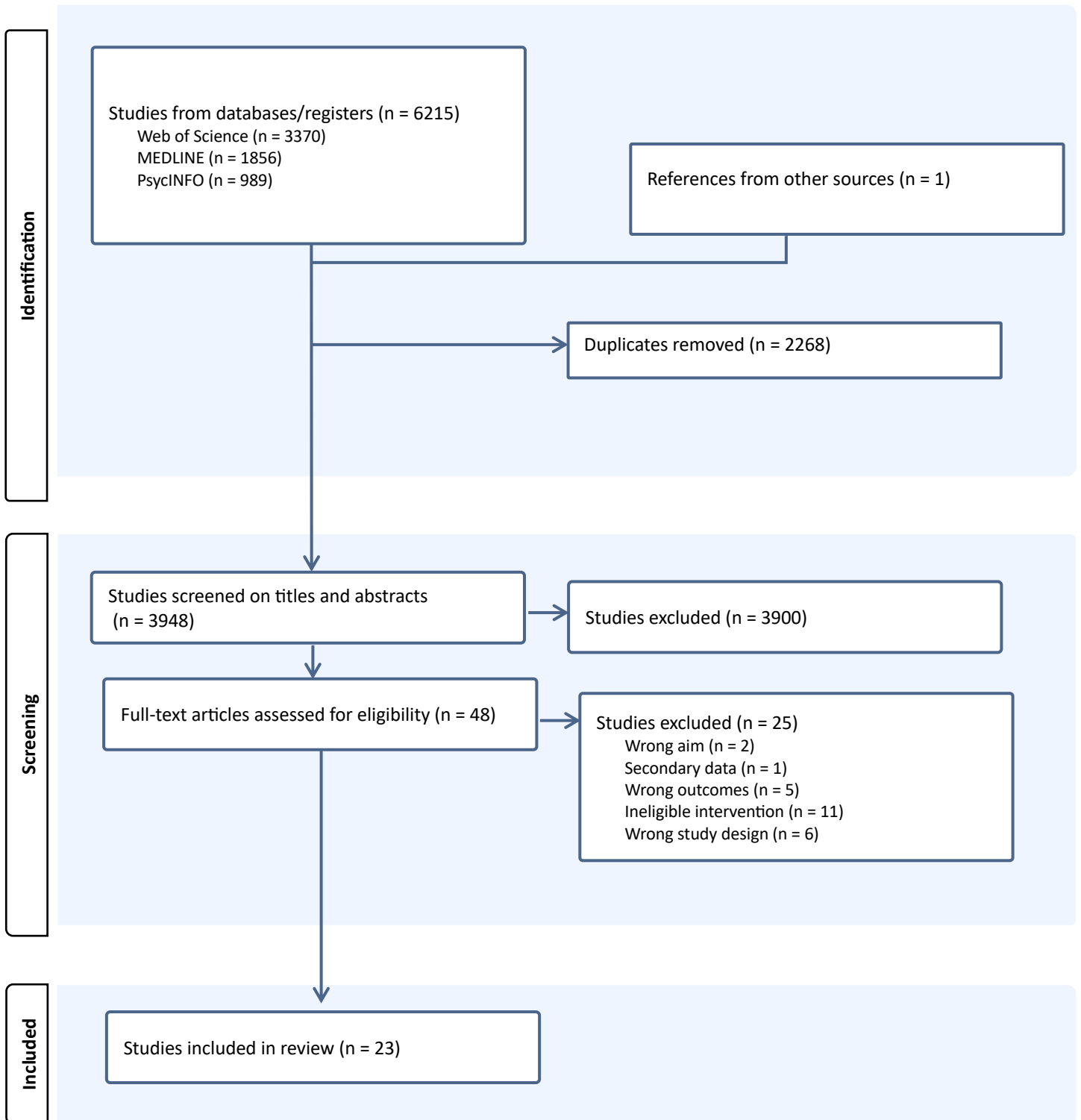
## **Results**

### **Study selection**

A total of 6215 references were yielded across PsycInfo, Medline and Web of Science. One paper was identified by reading the bibliography of key papers. After removal of duplicates, 3948 papers were selected for title and abstract screening. Of these, 3900 papers were excluded, and 48 studies were read in full and screened for inclusion and exclusion. A further 25 papers were excluded due to ineligible intervention, study design, outcomes, aim or analysis of secondary data. This left 23 articles for this review. Figure 1 provides a PRISMA flow diagram depicting an overview of the search and study selection process (Liberati et al., 2009). These studies are summarised in Tables 2 and 3.

**Figure 1**

*PRISMA flow diagram*



### **Brief overview of study characteristics**

Study characteristics are summarised in Table 2 whilst the general description and effectiveness of interventions are displayed in Table 3. A more thorough overview of the types of interventions will be described later in Results in response to the first review aim.

All the included articles were published between 2015 and 2023 with 18 (78.3%) published after 2020, highlighting the relatively recent increased interest in this area of research.

Of the 23 studies included, most were conducted in the USA (n=11, 47.8%). Five were published in Australia (21.7%), two each in China, Taiwan and Nigeria, and one study in Iran.

The most frequent study design was randomised controlled trials (RCTs) (52.2%), followed by one-arm pre-post trials (30.4%), quasi-experimental (13.0%) and one mixed-methods exploratory study (4.3%).

### **Sample characteristics**

The sample sizes ranged from 10 to 404, with a total of 2465 participants across studies and a mean of 107.2. Where indicated, the mean percentage of female participants across studies was 67.6%.

Three studies had an all-male sample; however, 78.3% (18/23) studies had a greater proportion of females, with five studies having an all-female sample. One study did not provide this information (Karim et al., 2021).

From the available data, the mean age of participants ranged from 10.2 to 59.6 years. Over half (56.5%) of studies indicated a mean age/majority age range of between 18-29 years, signifying the emerging adult demographic (Arnett, 2014). The majority of participants in five studies were aged over 30 years: three studies were focused on children aged under 18 years, and two provided no indication of age.

The authors of six included studies were contacted to request information that was not available in the article (Amon et al., 2022; Han et al., 2022; Karim et al., 2021; Li et al., 2021; Obichili et al., 2022; Yu, 2020), e.g. mean age, percentage of female participants. One responded (Han et al., 2022) who indicated that participants were asked for their age range, thus a mean age could not be calculated from their data.

There were three main types of populations for whom the interventions were generally tailored. Most of the interventions (11/23) appeared to be aimed for MH samples (e.g. young people with depression/anxiety, mothers with postpartum depression). This was followed jointly by interventions aimed for physical health samples (5/23) (e.g. HIV-positive men, cancer survivors) and non-health-specific samples (5/23) (e.g. university students). Two interventions were aimed for carers for people with dementia. The results tables will therefore be presented in order of these categories, sorted by year of publication.

**Table 2***Characteristics of studies sorted by intervention type*

Study	Country	N (% female)	Mean age	Population description	Baseline clinical severity (Depression/Anxiety)	Social media platform	Study design	Duration
<b>Interventions aimed for mental health samples</b>								
Boyd et al. (2019)	USA	24 (100); IG <sup>a</sup> : 12, CG <sup>b</sup> : 12	26.4	Mothers with postpartum depression (clinical)	Moderate/NA <sup>c</sup>	Facebook	Randomised controlled trial	8 weeks
McEnery et al. (2019)	Australia	10 (50)	23.0	Young people with first-episode psychosis and social anxiety (clinical)	NC <sup>d</sup> /moderate	Built network (MOST) <sup>e</sup>	One-arm pre-post trial	8 weeks
Rice et al. (2020)	Australia	89 (47)	19.8	Young people with social anxiety (clinical)	Moderate/severe	Built network (MOST)	One-arm pre-post trial	12 weeks
Bailey et al. (2020)	Australia	20 (55)	21.7	Young adult patients with current or recent suicidal ideation (clinical)	Moderate/NA	Built network (MOST)	One-arm pre-post trial	8 weeks
Seekis et al. (2020)	Australia	76 (100); IG: 42, CG: 34	18.3	Undergraduate women with pre-existing body concerns (NC)	NA/NC	Facebook	Randomised controlled trial	2 weeks

Study	Country	N (% female)	Mean age	Population description	Baseline clinical severity (Depression/Anxiety)	Social media platform	Study design	Duration
Karim et al. (2021)	USA	34 (NR) <sup>d</sup>	NR. Age range 14-26.	Adolescents and young adults with self-reported history of depression or anxiety (clinical)	Moderate/NC	Built network (blog)	One-arm pre-post trial	3 months
Amon et al. (2022)	Australia	154 (87)	NR <sup>f</sup> . Age range 13-25 (59.1% aged 13-15).	Young people seeking support for issues related to family discord and associated impacts on emotional wellbeing (clinical)	Mild/moderate	Built network	Mixed-methods exploratory study	8 weeks
Radovic et al. (2022)	USA	38 (76); IG: 18 (and 13 parents), CG: 20 (and 13 parents)	16.0	Young people in primary care with depression or anxiety (and their parents if interested) (clinical)	Moderate/moderate	Built network (blog)	Randomised controlled trial	6 weeks
Guevara et al. (2023)	USA	75 (100); IG: 38, CG: 37	29.2	Mothers with postpartum depression (clinical)	Moderate/NA	Facebook	Randomised controlled trial	3 months
Obichili et al. (2023)	Nigeria	303 (100); IG: 152 CG: 151	NR	First time mothers with postpartum depression	NR/NA	WhatsApp	Quasi-experimental design	12 weeks
Otu et al. (2023)	Nigeria	97 (54); IG: 49, CG: 48	42.2	Primary school teachers with severe depression (clinical)	Severe/NA	YouTube	Group randomised controlled trial	10 weeks



Study	Country	N (% female)	Mean age	Population description	Baseline clinical severity (Depression/Anxiety)	Social media platform	Study design	Duration
<b>Interventions aimed for physical health samples</b>								
Hightow-Weidman et al. (2015)	USA	15 (0)	26.0	Young Black men who have sex with men, and young Black transgender women (clinical)	Mild/NA	Built network	One-arm pre-post trial	1 month
Owen et al. (2017)	USA	347 (79); IG: 176, CG: 171	53.1	Cancer survivors living with high levels of distress (clinical)	Mild/NC	Built network	Randomised controlled trial	12 weeks
Li et al. (2021)	China	404 (0); TGT-SNs: 129, TGT-only <sup>h</sup> : 139, CG: 136	NR but all participants were aged 18+, 61.6% were aged under 30.	HIV-positive men who have sex with men	NR/NR	QQ	Randomised controlled trial	1 month
Pester et al. (2022)	USA	119 (85); Professional-led group: 59, Mutual support ('standard') group: 60	35.2	Adults with chronic pain	NR/NR	Facebook	Randomised controlled trial	4 weeks
Zamanifard et al. (2022)	Iran	40 (78); IG: 20, CG: 20	10.2	Children with Type 1 diabetes (clinical)	NC/severe	WhatsApp	Randomised controlled trial	6 weeks
<b>Interventions aimed for non-health-specific samples</b>								
Asbury et al. (2018)	USA	51 (100);	20.0	University women	NR/NR	Built network (journal)	Randomised controlled trial	10 weeks

Study	Country	N (% female)	Mean age	Population description	Baseline clinical severity (Depression/Anxiety)	Social media platform	Study design	Duration
		50% allocation between IG and CG						
Watkins et al. (2020)	USA	40 (0)	20.3	University-enrolled young Black men (NC)	NC/NA	Facebook	Quasi-experimental, mixed-methods pre-post design	5 weeks
Yu et al. (2020)	Taiwan	122 (66); IG: 61, CG: 61	20.5	University students (NC)	NC/NA	Facebook	Randomised controlled trial	3 weeks
Yu (2020)	Taiwan	136 but NR of how many participants per group (75)	NR	University students (clinical)	Severe/NA	Facebook	Randomised controlled trial	2 weeks
<b>Interventions aimed for carers</b>								
Han et al. (2022)	China	136 (82)	NR. 64.1% of participants aged 40-60.	Family carers of people with dementia (NC)	NC/NA	WeChat	One-arm pre-post trial	3-6 months depending on participant entry time
Hong et al. (2023)	USA	24 (71)	59.6	Chinese American dementia caregivers (NC)	NC/NA	WeChat	One-arm pre-post trial	7 weeks

<sup>a</sup>IG: Intervention group

<sup>b</sup>CG: Control group

<sup>c</sup>NA: Data not available

<sup>d</sup>NC: Non-clinical

<sup>e</sup>MOST: Moderated Online Social Therapy

<sup>f</sup>NR: Not reported

<sup>g</sup>TGT-SN: Intervention group consisting of posting Three Good Things in a social networking group

<sup>h</sup>TGT-only: Condition consisting of writing Three Good Things (no social media)

**Table 3**

*Reported outcomes of interventions on depression and/or anxiety outcomes sorted by intervention type*

Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
<b>Interventions aimed for mental health samples</b>					
Boyd et al. (2019)	Intervention was adapted from the Parents Interacting with Infants (PIWI; McCollum et al., 2001) intervention, for women with postpartum depression (PPD) symptoms. Included 8 weekly presentations by a trained facilitator on early infant parenting topics, depression psychoeducation and behavioural activation (PowerPoint presentation for the social media group).	1) Posting comments to the questions posed by the facilitator on their prior experiences.	Control (same intervention but in person)	Depression (BDI-II <sup>a</sup> )	Greater reduction in depression in the social media group compared with the in-person group who showed stable levels of depressive symptoms (95% CI [-18.0 to -2.2], $p < 0.01$ ).
McEnery et al. (2019)	EMBRACE is a MOST <sup>b</sup> -based intervention, informed by a CBT model for social anxiety disorder. Incorporates psychoeducational therapeutic content through comics ("steps"), behavioural experiments ("actions"), expert and peer moderation and interactive discussion boards ("talking points"). Clinical moderators sent weekly tailored content to each participant.	1) "Talking Points": users discussed and shared their own experiences regarding specific topics related to questions embedded within each of the "steps". 2) This included problem-solving discussions.	None	Depression (DASS-21 <sup>c</sup> )  Social anxiety (SIAS <sup>d</sup> ; LSAS <sup>e</sup> )	Significant reduction in social anxiety symptoms as measured by the SIAS ( $d=-1.70$ , $p<.005$ ) and the LSAS ( $d=-1.35$ , $p=.002$ ).  No significant decrease in depression ( $d=-.022$ , $p=.50$ ).
Rice et al. (2020)	Entourage is a MOST intervention adapted for young men, which incorporates: 1) expert clinical moderation, 2) evidence-based therapeutic content for social anxiety delivered via bespoke comics, and 3) peer-to-peer social networking. Participants continued in-person mental health treatment at their local healthcare centre while participating in Entourage.	1) Online social networking with a "Wall" feature for participants to "post" and interact. 2) "Steps": interactive therapy modules for social anxiety delivered through comics, with "Talking Points" where participants are prompted to discuss the symptoms depicted in the comic with each other.	None	Depression (PHQ-9 <sup>f</sup> ; MDRS-22 <sup>g</sup> )  Social anxiety (LSAS; BFNE <sup>h</sup> ; ASI <sup>i</sup> ; SIAS)	Significant decrease in depression as measured by the PHQ-9 ( $p<.001$ , $d=0.66$ ) and the MDRS-22 ( $p=.01$ , $d=0.30$ ).  Largest clinical improvement observed for social anxiety as measured by the LSAS ( $p<.001$ , $d=0.73$ ). Significant improves in social anxiety scores also supported on the BFNE ( $p=.001$ , $d=0.37$ ), ASI ( $p=.003$ , $d=0.34$ ) and SIAS measures ( $p<.001$ , $d=0.53$ ).

Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
		3) Online problem-solving forum ("Talk it out") in which users can nominate and discuss problem-solving issues they are facing.			
Bailey et al. (2020)	Affinity is an interactive, purpose-built platform, designed as a supplement to traditional face-to-face treatments for young people with suicidal ideation. Based on the MOST model, Affinity incorporates online social networking, expert and peer moderation, and therapeutic content delivered through graphic comics. No private messaging between participants.	1) A newsfeed (the "café") where participants and moderators can post comments, information, upload pictures and videos, and reply to content by other users. 2) Users can "like" and "react" to different content (react responses are predefined). 3) Online problem-solving forum ("Talk it out") in which users can nominate and discuss problem-solving issues they are facing.	None	Depression (PHQ-9)	Significant decrease in depression ( $p = .016$ , $d = -0.94$ ).
Seekis et al. (2020)	Single-session face-to-face 50-minute Mindful Self-Compassion workshop + a 2-week private discussion group on Facebook. Participants utilised self-compassion techniques when experiencing appearance distress and posted their experiences on a private Facebook group three times a week for 2 weeks.	1) Asked to post three times per week about an appearance-related situation where they utilised mindful self-compassion techniques and how this made them feel. 2) Responding to others' posts.	Control (waiting list)	Social appearance anxiety (SAASI)	Significant main effect of group on social appearance anxiety ( $F(1, 73) = 51.17$ , $p < .001$ , $\eta^2 = .41$ ). Relative to the control group, the intervention group reported lower social appearance anxiety at post-test, 1- and 3-month follow-up.

Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
Karim et al. (2021)	Supporting Our Valued Adolescents (SOVA) is a moderated intervention in which SOVA ambassadors (adolescents and young adults) are asked to write monthly blog posts around mental health, and comment on others' blogs. Promotion of self-disclosure, emotion regulation, meaning making and social support. No official duration of the study as long as participants were below age 27.	1) Participants were asked to write one blog post a month on any mental health topic. 2) Comment at least four times a month on other blog posts.	None	Depression (PHQ-9 modified for adolescents)  Anxiety (SCARED-C <sup>k</sup> )	No significant change in depression (p = .41) or anxiety (p = .22).
Amon et al. (2022)	Kids Helpline (KHL) aims to support young people with online counselling and peer-to-peer support. Each "circle" is a counsellor-facilitated, private online social network where counsellors post psychoeducation content (which focused on family discord and associated impacts on emotional wellbeing) to stimulate discussion and assist participants to develop self-help strategies. KHL counsellors posted 3 new topics per week, which also consisted of reflection and discussion activities to encourage engagement and interaction between participants. At least 100 participants per circle. No private messaging between participants.	1) Commenting on psychoeducational posts by counsellors or on other participant-generated posts. 2) Option to post their content.	None	Depression (DASS-21)  Anxiety (DASS-21)	Significant reduction in depression across time (p<.001) with significant decreases shown between baseline to midpoint (p<.001), and midpoint to postintervention (p=.045).  Significant reduction in anxiety (p<.001) with a significant decrease from baseline to midpoint (p=.025), but <i>not</i> from midpoint to postintervention (p=.104).
Radovic et al. (2022)	Intervention group: Supporting our valued adolescents (SOVA) websites + enhanced usual care (EUC). Control group: EUC alone.  <u>EUC/control arm</u> Routine follow-up by social worker regarding therapy attendance and	1) Participants could respond/comment on the daily blog posts generated by researchers to promote.. 2) ..discussion with other users.	EUC alone	Depression (PHQ-9)  Anxiety (GAD-7)	<u>Exploratory comparison of change scores between intervention and control group (regardless of whether they accessed SOVA)</u> No significant difference in depression change scores between the two groups at post-intervention (p>.09) but control group rendered significantly greater anxiety reduction compared to intervention group (p=.04).

Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
	<p>medication monitoring + receipt of psychoeducational materials and general crisis resources.</p> <p><u>Intervention arm</u> SOVA is a moderated blog-based website aiming to 1) challenge negative health beliefs and promote depression and anxiety knowledge through daily researcher-developed psychoeducational and motivational posts with peer commentary, 2) increase social support through online interactions, and 3) encourage parent-adolescent offline communication around mental health. Each article was modified and posted on the corresponding parent site (wiseSOVA) on the same day, also containing questions for discussion.</p>				<p><u>Six-week per-protocol analysis (due to significant crossover between groups)</u> No significant difference at post-intervention in depression (<math>p=.71</math>) or anxiety (<math>p=.42</math>) change scores between adolescents who accessed SOVA and those who did not.</p>
Guevara et al. (2023)	<p>Parenting with Depression (PWD) is a social media-based parenting program aimed at enhancing parenting skills and parent-child interactions for new mothers with PPD. The intervention included 8 weekly presentations by a trained facilitator on early infant parenting topics, depression psychoeducation and behavioural activation via PowerPoint. Facilitator reviewed posts and commented on participants' posts. Each Facebook group consisted of 6-10 participants.</p> <p>Intervention condition: PWD + Moodgym (online individual CBT program for reducing depressive symptoms)</p>	<p>1) Participants were encouraged to "friend" other participants. 2) Commented on other participants' posts based on the PWD topics.</p>	Moodgym alone	Depression (EDPS <sup>1</sup> )	Significantly greater reduction in depression for the intervention group versus control at 1-month ( $p<.001$ ), 2-months ( $p=.05$ ), but not at 3 months ( $p=.30$ ).

Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
Obichili et al. (2023)	Psychodrama therapy group was split into WhatsApp groups with 12 members each. The intervention involved weekly two-hour sessions, with the aim of reducing PPD symptoms. It was facilitated by a certified psychodrama therapist. Mothers were asked to provide narrative accounts of their experience with childbearing, which were empathised by the therapists and commented upon by other group members. Mothers were then asked to improvise roles of fictional new mothers adjusting to challenges of motherhood, followed by watching a short drama highlighting a mother positively adapting to the challenges of motherhood, versus her friend who did not.	1) Participants shared their experiences with motherhood. 2) Commented on each other's narration.	Control (no description specified)	Depression (EDPS)	Significant main effect of the psychodrama therapy in reducing symptoms of postpartum depression in women, $F(1,503) = 713.413$ , $p = .001$ , $\eta^2 = .441$ .
Otu et al. (2023)	Researchers uploaded counselling intervention videos on their YouTube channel once a day, twice a week for 10 weeks. Participants were asked to log in and watch the video, which were removed 5 hours after upload. Participants were to perform the tasks embedded in each video and were given the option to comment their reflections under the video. Vlog content covered depression psychoeducation and management techniques.	1) Commenting their reflections. 2) Shared and answered each other's questions for each video.	Control (no treatment)	Depression (BDI-II)	Significant decrease in depression amongst the treatment group relative to the control group at post-intervention ( $F(1,96) = 24.46$ , $p < .001$ , $\eta^2 = 0.843$ ), which was maintained at follow-up ( $F(1,96) = 21.47$ , $p < .001$ , $\eta^2 = 0.873$ ).
<b>Interventions aimed for physical health samples</b>					
Hightow-Weidman et al. (2015)	HealthMpowerment.org (HMP) is a mobile phone-optimised online intervention aimed to reduce risky sexual behaviours and promote health and wellness through psychoeducation and discussion. Designed	1) Discussion forums around safe sex and HIV care, sharing personal videos, audio, pictures, or prose.	None	Depression (CES-D <sup>m</sup> )	Significant decrease in depression ( $p = .045$ , $d = -0.30$ ).

Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
Owen et al. (2017)	<p>to promote positive norms, reflective appraisals, and supportive relationships between HIV-positive and HIV-negative individuals.</p> <p>Health-space is an online social networking and coping skills training program facilitated by a professional facilitator. The intervention provides access to 20-25 participants and two trained facilitators at any one time. Primary components included weekly educational modules &amp; 90-minute professionally-facilitated group chats, alongside a discussion board, personal profiles and private messaging for communication with other participants and facilitators.</p>	<p>2) Asking questions to an online sexual health/HIV doctor.</p> <p>1) Commenting their experiences, including reflections from each module and their associated activities.</p> <p>2) Problem-solving.</p> <p>3) Updating members on their current situation.</p> <p>4) Private messaging the entire group or only specific participants/facilitators.</p>	Control (waiting list)	<p>Depression (CES-D)</p> <p>Trauma-related anxiety (IES-R<sup>a</sup>)</p>	<p>Significant decrease in depression and anxiety for both the intervention group (<math>p &lt; .001</math> for depression, <math>p = .001</math> for anxiety) and the control group (<math>p &lt; .001</math>).</p> <p>Non-significant between-group difference in depression reduction (<math>d = -0.59</math>, 95% CI = -2.85-1.68) nor for anxiety reduction (<math>d = -0.42</math>, 95% CI = -1.64-0.80) across time.</p>
Li et al. (2021)	Three Good Things with electronic social networking (TGT-SN): participants were divided into five groups of 11-30 people on the social network platform QQ, in which they were asked to post three good things they had experienced.	<p>1) Post brief messages everyday on the group of three good things from their day for which they felt grateful.</p> <p>2) Respond to at least three other members' posts each day through comments and 'likes'.</p>	Control group: received information on mental health promotion once a week.	<p>Depression (CES-D)</p> <p>Anxiety (GAD<sup>o</sup>)</p>	<p>No main effect of TGT-SN in reducing depression when controlling for baseline depression scores (OR = 0.75, 95% CI 0.52–1.09, <math>p = 0.131</math>).</p> <p>Significant main effect of TGT-SN (vs. control) in reducing <i>anxiety</i> when controlling for baseline anxiety scores (adjusted OR = 0.62, 95% CI 0.43–0.89, <math>p = 0.009</math>).</p>
Pester et al. (2022)	<p>Each private Facebook group had 28-32 participants.</p> <p>Professional-led group: Investigators posted research-based material (reading &amp; videos) of influences on pain nearly every morning with associated prompts and activities to engage in. Participants encouraged to post questions, comments and general thoughts at any time.</p>	<p>1) Commenting questions and general thoughts/emotional disclosure.</p> <p>One group responded to material posted by researchers, the other group focused on mutual support</p>	NA. Both conditions included active SM use.	<p>Depression (PROMIS<sup>p</sup>)</p> <p>Anxiety (PROMIS)</p>	<p>Significant main effect of intervention on depressive symptoms with participants across conditions showing small-medium reductions across time (<math>p = .002</math>, <math>\eta^2 = .05</math>). Simple main effects analyses indicate significant differences between scores from baseline to post (<math>p = .031</math>) and baseline to 1-month (<math>p &lt; .001</math>).</p> <p>No significant main effect of anxiety (<math>p = .242</math>)</p>



Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
	Mutual support ('standard') group: encouraged to offer mutual support for other participants through posting questions, comments, and general thoughts at any time with no professional facilitator.	with no planned prompting material.			
Zamanifard et al. (2022)	Virtual directed painting therapy. Intervention group = routine care + virtual painting therapy on WhatsApp video call with groups of 3-4 other children. Each group was facilitated by the main researcher (a paediatric-nurse trained painter) and moderated alongside the assistant psychologist (AP) and one of the children's parents, with each 2-hour session held once a week. Based on painting therapy principles, participants were asked to use colours to express their feelings and draw any topic they were interested in. At the end of each session, participants sent a photo of their painting to the group. They explained what they painted to the AP through WhatsApp.	1) WhatsApp video group call. 2) At the end of each session, children sent a photo of their painting onto the WhatsApp group. 3) Asked to briefly explain what they had painted to the AP.	Control (routine diabetes care alone)	Depression (CDI <sup>a</sup> ) Anxiety (SCAS <sup>r</sup> )	Compared to control, the intervention group displayed significantly reduced anxiety (p=.02) and depression (p<.001).
<b>Interventions aimed for non-health-specific samples</b> Asbury et al. (2018)	Online group journaling intervention aimed to strengthen family relationships through self-disclosure of feelings and thoughts about everyday life events in answer to prompts provided by the FamilyeJournal (FEJ) platform.  Half of participants were randomly assigned to the FeJ user group and asked to invite 3-5 friends/family members to FeJ to join their closed group. Participants	1) Self-disclosure/posting their thoughts and feelings about everyday life events (in response to prompts) to 3-5 friends/family members.	Control (no treatment)	Depression (DASS-21) Anxiety (DASS-21)	Intervention group reported lower depressive symptoms over time, compared with control (p<.05).  No difference between groups for anxiety symptoms (p>.05).

Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
	were asked to respond to prompts provided by FeJ three times a week. Family members could comment on participant responses.				
Watkins et al. (2020)	The Young Black Men, Masculinities, and Mental Health (YBMen) intervention, informed by social factors/theories of health, aims to improve participants' mental health, masculine norms and social support. Research team members delivered daily content in private Facebook groups and initiated group discussions on the shared content (articles and news media on Black masculinity, mental health and social support). In the final week, participants developed individual and group action plans based on the intervention content and aims.	Private Facebook group: 1) participants react ('like', reply/comment) to daily content posted by the intervention moderator. 2) Group discussions on the shared content through participants generating their own conversations and initiating posts or sharing any additional content they feel is relevant to each week's topic (with and without being prompted by the intervention moderators and group managers).	None	Depression (PHQ-9; GMDS)	Participants experienced fewer depressive symptoms at post-intervention (PHQ-9: $p < .01$ , GMDS: $p < .05$ ).
Yu et al. (2020)	Positive savouring intervention. Participants were asked to attend to the positive feelings they were experiencing whilst doing an activity that they enjoy for at least 20 mins a day, at least 3 times per week. After the activity, they were asked to post a description of these positive feelings (e.g. via text, photos) on a social networking site. Participants also recorded information on their experiences on a "My Little Happy Things Record Form". On the weekends, participants were to recall these positive emotions and activities they had felt from the week.	After doing something they enjoyed, participants were asked to: 1) Describe and post their associated positive feelings on a social networking site using text and/or photos.	Control (no treatment)	Depression (CES-D)	Relative to control, the treatment group displayed significantly lower depression in the post-test ( $p = .031$ , eta square = 0.045), which was not maintained at the follow-up ( $p = .295$ ).

Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
Yu (2020)	<p>Positive interventions asking participants to post every 2-3 days, which their Facebook friends could comment and "like".</p> <p><u>Photo diary group</u> Participants were asked to post photos/videos that made them happy in a personal Facebook album with a reason for choosing each photo/video. The aim was to use self-disclosure to encourage emotional sharing, social support and happiness.</p> <p><u>Expression of gratitude group</u> Participants were asked to write a declaration of gratitude on someone's Facebook wall, changing every 2-3 days (e.g. "Thanks to .. for..."). The aim was to improve participants' emotional status through the expression of gratitude.</p>	<p><u>Photo diary</u> 1) Posting photos/videos that made them happy with reason why they choose each photo/video.</p> <p><u>Expression of gratitude</u> 1) Posting on someone's wall (a declaration of gratitude to them).</p>	Control (no treatment)	Depression (CES-D)	<p>Compared to control, the photo diary group displayed significantly reduced depression in the post-test (<math>p=.002</math>) and at the follow-up (<math>p=.010</math>). Participants were still posting significantly more photos/videos at follow-up compared to pre-test stage (<math>p&lt;.05</math>).</p> <p>Compared to control, no effect for the expression of gratitude group on depression at post-test (<math>p=.072</math>) nor at follow-up (<math>p=.083</math>).</p>
Janicke-Bowles et al. (2022)	<p>Intervention conditions: participants searched for and shared either inspiring or hedonic content.</p> <p>Control condition: participants passively browsed Facebook.</p>	1) Posting/sharing content that participants perceived as either inspiring (inspiring content condition) or funny (hedonic content condition) to the study's corresponding Facebook group page for at least 5 minutes each day for 10 days.	Passive browsing of Facebook for at least 5 minutes each day for 10 days.	<p>Depression (DASS-21)</p> <p>Anxiety (DASS-21)</p>	No significant change over time in neither the active condition nor the passive condition for anxiety ( $p>.05$ ) and depressive symptoms ( $p>.05$ ).
<b>Interventions aimed for carers</b> Han et al. (2022)	The professionally-facilitated peer support group included peer emotional support, lectures, consultation technique support and reading articles.	<p>1) General discussion (free chatting), sharing experiences of daily care, pictures, videos. Providing emotional support.</p> <p>2) Messaging answers to</p>	None	Depression (CES-D)	Significant decrease in depression ( $p=.045$ ).

Study	Summary of intervention	Elements of active social media use from participants	Comparison group(s)	Depression/anxiety outcome measure(s)	Main findings
Hong et al. (2023)	The WECARE intervention aimed to reduce caregiving burden & distress and improve psychosocial wellbeing of Chinese American dementia caregivers. Participants received a total of 40 multimedia articles across the intervention, sent weekly by researchers. Themes of articles include caregiving around dementia and stress management & self-care resources. Additionally, three moderated group meetings were organised on weeks 3, 5 and 7 to facilitate social networking via WeChat.	questions from online lectures. WeChat group meetings involved peer support and networking through: 1) Initiation of group chats. 2) Private chats (messaging), 3) Video calls.	None	Depression (CES-D)	Significant decrease in depression ( $p < .001$ , $d = -0.89$ ).

<sup>a</sup>BDI: Beck Depression Inventory

<sup>b</sup>MOST: Moderated Online Social Therapy

<sup>c</sup>DASS-21: The Depression, Anxiety, Stress Scales

<sup>d</sup>SIAS: The Social Interaction Anxiety Scale

<sup>e</sup>LSAS: Liebowitz Social Anxiety Scale

<sup>f</sup>PHQ-9: Patient Health Questionnaire

<sup>g</sup>MDRS-22: Male Depression Risk Scale

<sup>h</sup>BFNE: Brief Fear of Negative Evaluation from Others Scale

<sup>i</sup>ASI: Anxiety Sensitivity Index

<sup>j</sup>SAAS: Social Appearance Anxiety Scale

<sup>k</sup>SCARED-C: Screen for Child Anxiety Related Disorders-Child

<sup>l</sup>EDPS: Edinburgh Postnatal Depression Scale

<sup>m</sup>CES-D: Center for Epidemiologic Depression Scale

<sup>n</sup>IES-R: Impact of Events Scale-Revised

<sup>o</sup>GAD: General Anxiety Disorder Scale

<sup>p</sup>PROMIS: Patient-Reported Outcomes Measurement Information System

<sup>q</sup>CDI: Children's Depression Inventory

<sup>r</sup>SCAS: Spence Children's Anxiety Scale

<sup>s</sup>GMDS: The Gotland male Depression Scale

## Quality analysis

Mean scores for external, internal and construct validities were derived for each study according to the MQS checklist (Chácon-Moscoso et al., 2023). See Supplementary Table 1 for the individual breakdown per study. Table 4 presents the frequencies and percentages of studies that rated a low, medium and high-quality level for each facet across all studies. External validity was rated 'medium' for the majority of studies. Although eligibility criteria and attrition rate were specified, 15/23 studies did not impute values for missing data and 4/14 studies that had multiple groups did not specify attrition between groups (Asbury et al., 2018; Otu et al., 2023; Owen et al., 2017; Yu et al., 2020). Internal validity was generally rated as low-medium across studies. This was strengthened by the pre-post (and occasional follow-up period) nature of all included studies; however, many studies lacked the use of control techniques (e.g. masking) (n=11) and only one study had a pre-post/follow-up period of greater than six months (Li et al., 2021). No study rated highly across all three facets, although all studies rated highly on construct validity owing to the well-defined, standardised measures used for measuring depression and anxiety as reflected by the inclusion criteria.

**Table 4**

*Distribution of studies by quality level for external, internal and construct validities depicted as frequencies (percentages)*

Level of quality	External validity	Internal validity	Construct validity
Low	4 (17.39)	10 (43.48)	0 (0.00)
Medium	15 (65.22)	11 (47.83)	0 (0.00)
High	4 (17.39)	2 (8.69)	23 (100.00)

## Types of interventions

In general, interventions ranged in duration from 10 days to 6 months, with the mode being around 12 weeks (6/23), followed by 8 weeks (4/23) and 4 weeks (3/23).

SM platforms were predominantly used as tools to promote social support alongside the delivery of psychoeducational and skill-based materials. Technological features that were actively encouraged to be used by participants across studies included user-generated posts (n=23), group (structured and unstructured) forums (n=18), commenting on researcher/peer posts (n=17), private messaging (one-to-one, group) (n=7), reactive capacities (n=5) and friend requesting peers (n=3). With regards to mode of user-generated content, this was mostly through text; however, a few specified the option of other media formats including images, videos and audio (n=8).

All studies promoted self-disclosure from participants, which varied in the form of general reflections, specific prompts, experiences triggered by psychoeducational material, discussion/problem-solving groups or creative avenues. For instance, Zamanifard et al. (2022) conducted a virtual-directed painting therapy intervention via WhatsApp video call for children with Type 1 diabetes to complement routine diabetes care. Participants were asked to express their feelings through painting and send their photos to the study WhatsApp group. Moreover, through the delivery of a psychodrama therapy group via WhatsApp, Obichili et al. (2023) asked mothers to share their own childbearing experiences and comment upon the accounts of others in the group.

Nine studies utilised purpose-built networks, e.g. Moderated Online Social Therapy (MOST) or blogs. Facebook was the most common (pre-)existing SM platform employed (8/23), followed equally by WeChat (2/23) and WhatsApp (2/23). One intervention each incorporated the use of YouTube and QQ.

Of the nine studies utilising purpose-built networks, three utilised the MOST framework, which was originally developed for youth MH (Bailey et al., 2020; McEnery et al., 2019; Rice et al., 2020). MOST works by blending digital evidence-based therapeutic content delivered via bespoke comics, with expert clinical moderation and peer-to-peer social networking functions that mirror those in existing social networking platforms. In these interventions, participants were given the option to discuss their own experiences in relation to the questions prompted by the psychoeducational therapy content and invite problem-solving discussions in relation to their symptoms. In the Bailey et al. (2020) study, young adults with suicidal ideation could upload general updates via text, pictures and videos, to which other users could respond through commenting or 'liking'.

"HealthMpowerment.org" (Hightow-Weidman et al., 2015), "Health-space" (Owen et al., 2017) and "Kids Helpline" (Amon et al., 2022) followed a similar structure of participants responding to psychoeducational and skills-based material tailored for the study participants. Three other purpose-built networks were designed to allow young people to blog monthly around their MH experiences (Karim et al., 2021), respond to researcher-generated blog posts (Radovic et al., 2022) or write tri-weekly online journal entries around their thoughts and feelings in answer to specific researcher-generated prompts, which were shared with 3-5 friends/family members (Asbury et al., 2018).

Four articles (17.4%) requested participants to post specific content throughout the intervention. This included posting three good things for which they felt grateful and responding to other participants' reports on QQ (Li et al., 2021). Other interventions on Facebook required participants to post descriptions of positive feelings experienced after doing something enjoyable using text and/or photos (Yu et al., 2020), keep a photo diary of photos/videos that made them happy with reasons why or posting expressions of gratitude on a Facebook friend's "wall" (Yu, 2020), or sharing inspiring or funny content on the study's Facebook group everyday (Janicke-Bowles et al., 2022).

Other interventions utilised private Facebook groups to share experiences with regards to psychoeducation or skills training, which prompted further discussion with other participants (Boyd et al., 2019; Guevara et al., 2023; Pester et al., 2022; Seekis et al., 2020; Watkins et al., 2020). Two interventions that aimed to improve emotional wellbeing in Chinese dementia caregivers encouraged participants to use WeChat to share daily experiences and provide emotional support in response to researcher-sent materials (Han et al., 2022), with the option of networking through videos, pictures, group chats or private messaging (Hong et al., 2023).

Most interventions (17/23, 73.9%) were facilitated by professionals/members of the research team, with the role of the facilitator(s) being to deliver psychoeducational/therapeutic content, encourage cross-dialogue between participants and monitor risk in participants' activities. One study utilising a purpose-built network enabled young people to directly message an HIV doctor around questions of sexual health (Hightow-Weidman et al., 2015). Pester et al. (2022) compared the effectiveness of two private Facebook groups, of which one was professional-led and consisted of participants responding to chronic pain-related material posted by researchers, and the other group with no professional facilitator whereby participants offered mutual support with no planned prompting/material. Four studies did not specify whether participants had direct contact to a facilitator throughout the duration of the interventions (Asbury et al., 2018; Janicke-Bowles et al., 2022; Yu, 2020; Yu et al., 2020).

### **Reported outcomes on depression and anxiety**

Depressive symptoms were assessed in 23 studies, and anxiety in 12. All studies used validated measures of depression and/or anxiety. The most frequently used measure of depression (7/23) was the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) whilst for anxiety (7/12), this was the Depression, Anxiety and Stress scale (DASS; Lovibond & Lovibond, 1995).



### *Depression outcomes*

Amongst the 23 studies examining depression outcomes, 16 demonstrated potential improvements, with reported effect sizes ranging from small to large. Eight of these studies involved clinical samples: three with mild depression (Amon et al., 2022; Hightow-Weidman et al., 2015; Owen et al., 2017), three with moderate depression (Bailey et al., 2020; Boyd et al., 2019; Rice et al., 2020), and two with severe depression (Otu et al., 2023; Yu, 2020). The remaining eight studies included non-clinical samples (Han et al., 2022; Hong et al., 2023; Watkins et al., 2020; Yu et al., 2020; Zamanifard et al., 2022) or did not report baseline depression values (Guevara et al., 2023; Janicke-Bowles et al., 2022; Li et al., 2021).

Seven studies reported no change in depression symptoms. Of these, four included clinical samples, with three reporting moderate depression (Karim et al., 2021; Guevara et al., 2023; Radovic et al., 2022) and one reporting severe depression (Yu, 2020). The remaining three studies involved non-clinical samples (McEnery et al., 2019) or did not report baseline values (Janicke-Bowles et al., 2022; Li et al., 2021). Overall, whilst improvements were observed across both clinical and non-clinical populations, no clear pattern emerged between baseline severity and the likelihood of improvement. However, the absence of baseline data in some studies limits the ability to fully assess the impact of initial symptom severity on outcomes.

Of these 23 studies, 11 also measured anxiety (effects on anxiety described below). Twelve studies used a control group, of which eight reported improvements. The nature of control interventions included no treatment (n=5), routine care (n=2), an in-person form of the SM-based intervention (n=1), waitlist (n=1), passive browsing of Facebook (n=1) and receipt of MH promotion material (n=1). One study did not provide a description of the control group (Obichili et al., 2023). No obvious trends were observed across the presence and nature of control groups, SM platforms used, technical features, proportion of females and sample sizes (15 to 347) and whether the intervention significantly improved depression outcomes, reflecting the varied approaches taken by the studies.

Four RCTs reported results at follow-up, ranging from intervention durations of two weeks to 10 weeks, and follow-up periods from four weeks to five months post-intervention. Of these four, three studies found that improvements in depression were maintained at four-week follow-up (Otu et al., 2023; Pester et al., 2022; Yu, 2020). However, Yu et al., (2020) found *no* between-group difference in depression reduction at four week follow-up, suggesting that the positive savouring intervention may have had an immediate impact but did not show sustained benefits over time.

### *Anxiety outcomes*

With respect to anxiety outcomes, 7/12 studies showed potential improvements with reported effect sizes ranging from small to large. Of these, four included clinical samples, with three involving participants with moderate anxiety (Amon et al., 2022; McEnery et al., 2019; Radovic et al., 2022) and one with severe anxiety (Zamanifard et al., 2022). Two studies involved non-clinical samples (Owen et al., 2017; Seekis et al., 2020), and one did not report baseline values (Li et al., 2021).

Five studies reported no change in anxiety symptoms, two of which provided baseline values: one clinical sample with moderate anxiety (Radovic et al., 2022) and one non-clinical sample (Karim et al., 2021). The remaining three did not report baseline values (Asbury et al., 2018; Janicke-Bowles et al., 2022; Pester et al., 2022). Based on the available information, these findings suggest that baseline severity may be associated with the potential for improvement, particularly in clinical samples with moderate or severe anxiety. However, reductions were also observed in non-clinical samples, and with several studies lacking baseline data, the relationship between baseline severity and outcomes remains tentative.

Of the 12 studies, seven used a control group, of which four reported improvements. Due to the significant overlap in studies that measured both depression and anxiety (n=11), the nature of control interventions was largely outlined above, i.e. routine care (n=2), waitlist (n=2), no treatment

(n=1), passive browsing of Facebook (n=1) and receipt of MH promotion material (n=1). No consistent pattern was identified with respect to the presence of a control group, nature of the control group, SM platforms used, technical features, proportion of females and sample sizes (15 to 347) and whether the intervention significantly improved anxiety outcomes. However, it is worth noting that amongst the studies that reported no change to depression/anxiety outcomes, participants tended to be AYA (aged 14 to 29).

One RCT, which did not measure depression severity, found that improvements in social appearance anxiety observed at two weeks post-intervention were maintained at both one- and three-month follow-ups (Seekis et al., 2020).

### *Considerations*

Taken together, these findings seem to suggest that most interventions that intentionally incorporate active SM use hold potential for reducing depression and anxiety symptoms across demographics. However, these findings must be interpreted in light of the small sample sizes in many of these studies (Bailey et al., 2020; Boyd et al., 2019; Hightow-Weidman, 2015; Hong et al., 2023; McEnery et al., 2019; Watkins et al., 2020; Zamanifard et al., 2015) and lack of diversity within study samples, which may inflate effect size and limit generalisability of findings. Many studies also lacked a control group, limiting causal inferences, and did not use control techniques (e.g. blinding), decreasing the internal validity of findings.

It is also worth noting that although depressive and anxiety symptoms decreased in the Owen et al. (2017) study, no between-group differences were seen with the waitlist control group. This may be explained by the lack of engagement in the intervention group who spent a total average of 7.3 hours using the intervention across the 12 weeks, compared with the encouraged 12-24 hours.

Despite the improvements in depression scores, missing information on sample characteristics (e.g. age) and no description of the control group were provided in the study by Obichili et al. (2023). Attempts were made by the author to request this information, however no response was given. Therefore, caution needs to be taken when deciphering the generalisability of these findings.

In addition, these findings revealed that a minority of interventions of active SM use demonstrated no effect on depressive or anxiety symptoms. Interestingly, this lack of change was only found in AYA samples, despite many studies involving AYA also showing improvements in MH. This included the only study that purposefully compared the results of an active SM use group (sharing inspiring or funny content to the study's Facebook group) with a passive SM use group (passively browsing Facebook) for at least five minutes each day for 10 days (Janicke-Bowles et al., 2022). This article found no change over time in depression or anxiety scores in both conditions, reflecting a lack of difference on MH between short daily active engagement versus passive browsing for the same amount of time. However, it must be noted that the unequal sizes across study conditions may have made it difficult to detect significant effects of the intervention.

## **Discussion**

In response to the rising rates of MH problems and rapid growth of SM use worldwide (Health & Social Care Information Centre, 2020; Statista, 2022), there has been increased interest exploring the relationship between SM use and MH highlighted in recent years. This research has yielded mixed findings, with passive SM use regularly being associated with poorer wellbeing (Thorisdottir et al., 2019; Yang et al., 2021). In contrast, active SM is typically associated with improved wellbeing, self-esteem and feelings of closeness, linked with SM's capacity to facilitate social developmental processes of self-disclosure and social connection (Subrahmanyam and Šmahel, 2011a;

Subrahmanyam and Šmahel, 2011b). To address the global concern of increased MH difficulties, there could be benefit for further development of interventions that promote *active* SM use. However, there is a need for a systematic review to explore the nature of such existing interventions and their potential impact on MH outcomes. The present review aimed to do this across ages and population types in relation to depression and anxiety outcomes. This is with the hope of identifying potential opportunities and challenges in this area of research, which can inform the direction of future research needed to clarify resulting queries.

## **Main findings**

### *Nature of included interventions*

Despite a considerable body of research on SM spanning over 16 years (Boyd & Ellison, 2007), the present scoping review rendered only 23 articles, reflecting a comparable shortage of studies investigating interventions incorporating the active use of SM to improve depression and anxiety symptoms. Due to variable reporting of the description and engagement of SM features as well as variations in sample demographics and study designs, this discussion will describe and explain the findings *holistically* in relation to the two research aims, thus reducing potential misattributions of effects to inappropriate causes (e.g. to features of active SM use rather than to other attributes of the intervention).

To address the lack of shared definitions in research on SM use and MH, Meier and Reinecke (2020) conducted a meta-review of computer-mediated communication research. The findings regarding the nature of the included studies will be summarised using three main levels of analysis from Meier and Reinecke's (2020) channel-centered model: the type of application (e.g., SM, email), application brand (e.g., Facebook, WhatsApp), and features (e.g., newsfeed, messenger, "likes").

All studies incorporated a form of SM, with types and brands including established SM platforms (e.g. Facebook), purpose-built networks (i.e. MOST interventions, blogs/journals), and private messaging applications (i.e. WhatsApp, QQ, WeChat). These SM platforms were mostly used as tools to deliver psychoeducational and skills-based material and to promote social connection amongst peers. This was aided by the most common feature reported across the included studies, i.e. the exchange of user-generated material through platforms with varying degrees of structure (e.g. responses to prompts versus general reflections) and formats (e.g. text versus multimedia). Most interventions were reported to be facilitated by professionals/researchers, predominantly to moderate conversations and sometimes by sharing prompting content. Many interventions allowed participants to communicate and engage with content through multiple features within an intervention, e.g. through posting own content through a newsfeed or group, commenting on others' posts, private messaging and expressing support through "likes".

Notably, only three studies involved the use of participants' own existing SM networks as part of the intervention. Asbury et al. (2018) asked participants to nominate three to five family members/friends to view and comment on participants' responses to prompts around their thoughts and feelings on everyday life events via a blog. Whereas Yu et al. (2020) and Yu (2020) asked participants to post specific types of content on their main Facebook networks. The practical challenges associated with involving one's own SM network, such as size and uncontrolled activity can serve as confounding factors to any observed findings and may explain their infrequent integration into SM intervention research. On the other hand, the more frequent use of built networks, as observed in the literature, may be more favoured due to the allowance of more controlled manipulations from researchers to examine between-group differences with greater internal validity (Kruzan et al., 2022).

Due to a lack of detailed reporting and monitoring of specific use of individual SM features, it was not possible to comment on *how much* each feature was engaged with by participants across studies.

Consequently, we could not draw conclusions about the specific elements of active SM use and their impact on MH. This limitation likely reflects the generally non-specific descriptions of SM use in the literature, where too few studies specify the nature of the interaction. For example, some authors provide broad descriptions of SM use in interventions (e.g., “an online group discussion about depression”), whilst comparably few outline specific types of SM use (e.g., platform features, interaction directionality, mode, and content of interactive messages).

The latter is still a work-in-progress and is beginning to be conceptualised by researchers (e.g. Meier & Reinecke, 2020). This could be partly attributed to the relatively recent interest in this field of SM use interventions on MH, as reflected by a large proportion (78.3%) of studies in this review being published from 2020 onwards. This highlights an opportunity for future research to address this through comprehensively measuring technology use, e.g. through digital tracking (Bayer et al., 2018), and explore levels of SM use at both a channel-level (e.g. application features) and an interaction level (e.g. how and with whom users interact within a channel, mode and accessibility of content) to facilitate comparisons.

#### *Reported outcomes on mental health*

With regards to MH outcomes, findings were mixed; however, significant decreases in depression and anxiety levels were observed across most studies, with small to large effect sizes for the RCTs. This is comparable with the small to moderate effect sizes reported in other reviews of online interventions (Goldberg et al., 2022; Kruzan et al., 2022). Decreases were seen across population demographics, study designs and active SM use features. Consistent with headcount rates found in reviews of interventions targeting the *amount* of SM use (Plackett et al., 2023) and MH interventions hosted online (Kruzan et al., 2022), the current review found that 70% of studies that measured depression showed some benefit, whilst a slightly lower proportion (58%) showed significant improvements in anxiety. These results may suggest that interventions incorporating active SM use

could have a somewhat greater impact on depression than anxiety, though further research is needed to clarify this potential distinction.

Given the consistent link between loneliness and greater depressive symptom severity (Wickramaratne et al., 2022), the act of self-disclosure and interactions with similar others afforded by the active use of SM in these interventions may increase feelings of social connectedness, thereby decreasing depressive symptoms. This explanation is supported by the interpersonal-connections-behaviours framework (Clark et al., 2018), which proposes that SM use can improve wellbeing to the extent that it promotes the core needs of acceptance and belonging [see Tibber & Silver (2022) also].

It is worth noting that the relationship between baseline symptom severity and the potential for improvement remains unclear in this review. Amongst the 23 studies on depression, 16 showed potential improvements, but no clear pattern emerged between baseline severity and potential for improvement, with some clinical samples demonstrating reductions whilst others did not. Similarly, in anxiety outcomes, seven studies indicated potential improvements, yet reductions were also observed in non-clinical samples. This suggests that factors beyond baseline severity, such as engagement with the intervention or specific intervention features, may influence outcomes. Additionally, the lack of baseline data in some studies limits the ability to draw firm conclusions about the potential influence of initial symptom severity on the results.

Due to the low-to-moderate internal validity ratings across the included studies, caution must be taken when interpreting the findings of the present review. The mixed findings may be partly attributed to the small sample sizes of many studies, with 10 having recruited 51 or fewer participants (Asbury et al., 2018; Bailey et al., 2020; Boyd et al., 2019; Hightow-Weidman et al., 2015; Hong et al., 2023; Karim et al., 2021; McEnery et al., 2019; Radovic et al., 2022; Watkins et al., 2020; Zamanifard et al., 2022). Such small sample sizes can undermine internal validity by inflating the reported effect sizes. In addition, due to the exploratory/pilot nature of two studies (Bailey et al.,



2020; Radovic et al., 2022), multiple comparisons were not adjusted for, which may have further increased the likelihood of making a type 1 error (i.e., a false positive). Future studies should strive to include a larger sample to strengthen the power of findings.

Moreover, it was difficult to draw stronger conclusions regarding the effectiveness of the interventions themselves due to several key issues. Firstly, the insufficient engagement time encouraged in the interventions may have played a role. For instance, in one study where no effects on depression or anxiety were found, participants were instructed to post specific content to the study Facebook group for just five minutes each day (Janicke-Bowles et al., 2022). This duration may have been too low, considering that AYA typically spend around three hours on SM daily (Georgiev, 2022). Additionally, there were no adherence checks to ensure participants actually used the prescribed five minutes of SM per day, further complicating the interpretation of the intervention's effectiveness.

Another issue is that many analyses of studies did not adjust for participants' engagement with the intervention. An exception is Radovic et al. (2022), whose intervention was publicly accessible, which inevitably allowed the control group to access it as well. Initially, they found *greater* anxiety reduction in the control (usual care) group compared to the intervention group. However, after adjusting for participants who accessed the intervention site across both groups, this difference disappeared. This suggests that crossover between groups may have occurred, potentially underestimating the power of detecting effects of these active SM interventions on MH. Future studies should strive to capture intervention engagement across groups (e.g., counting the number of interactions per user) to account for any potential crossover effects when there is public access to the intervention.

## Limitations

In conducting this systematic review, several limitations emerged, as did limitations inherent in the broader literature.

One notable constraint of the review lies in the specificity of the eligibility criteria. By focusing solely on studies that *intentionally* incorporated some form of active SM use as part of the intervention, relevant interventions including elements of active SM use but not meeting the predefined criteria may have been inadvertently excluded.

Furthermore, whilst the review exclusively focused on outcomes related to depression and anxiety, chosen for their global prevalence (IHME, 2022), this narrow focus limits the generalisability of the findings to other MH or wellbeing-related constructs. Additionally, although the review was strengthened by the use of validated measures of depression and anxiety across all studies, reliance on self-report measures for these outcomes may introduce biases, such as social desirability bias, potentially affecting the validity of the results.

Another limitation of this review is the decision not to conduct a meta-analysis, as the substantial diversity amongst the included studies would have compromised the interpretability and meaningfulness of pooled results. Attempting to aggregate findings from studies with widely differing intervention characteristics and sample compositions would have risked oversimplifying complex and nuanced interventions, potentially leading to misleading or uninformative conclusions about the MH outcomes associated specifically with *active* SM use (Sharpe, 1997).

The included studies varied significantly in the specific SM features and platforms used, as well as the nature and level of participant engagement. Many studies described interventions only in broad terms (e.g., 'online discussion forum' or 'group chat') without specifying key elements such as platform features (e.g., commenting, posting), interaction types (e.g., one-on-one or group), content format (e.g., text, images, videos), or the type of content shared. Such general descriptions limited

the ability to discern which specific aspects of *active* SM use (if any) might be driving MH effects, complicating any attempt to derive consistent patterns or conclusions from aggregated data.

For future meta-analyses to yield meaningful insights regarding *active* SM use (versus general SM use), studies should adopt more consistent reporting practices. This includes specifying which SM features are utilised, how participants engage with these platforms, and providing detailed descriptions of platform design and participant activity. As studies adopt these practices, meaningful meta-analyses that are able to specifically relate *active* SM use to MH outcomes may become feasible and more capable of providing clear, actionable conclusions.

Several other limitations inherent in the existing literature also affect the findings of this review. Notable amongst these is the lack of well-matched control groups comparing active versus passive SM use within interventions. For instance, only one study (Janicke-Bowles et al., 2022) provided a comparison between active and passive SM use within interventions, limiting the ability to draw robust conclusions about the potential added benefits of active SM use on depression or anxiety outcomes. This absence complicates the ability to determine the specific effects and potential benefits of active SM use on MH outcomes, such as depression and anxiety, making it challenging to isolate the effects of active SM use from other potential confounding variables.

Additionally, many studies in the literature report small-to-moderate sample sizes (mean N=107.2), potentially limiting the generalisability of findings. Furthermore, the predominant recruitment of young, well-educated females from countries with majority white populations reflects a lack of diversity in the research samples. This limitation undermines the external validity of research findings, as they may not accurately represent broader populations. For example, as noted by Henrich et al. (2010), the overrepresentation of certain demographic groups, such as WEIRD (Western, Educated, Industrialized, Rich, and Democratic) populations, is a common issue in psychological research and may limit the generalisability of findings to more diverse populations.

Finally, a notable limitation within the literature is the lack of long-term follow-up data in many studies. Without sufficient follow-up periods, it is difficult to assess the sustainability of MH improvements over time. This gap underscores the need for future studies to include longer follow-up periods to better understand the lasting effects of interventions.

## **Implications**

The findings of this review highlight the need for clearer and more consistent reporting of SM use within interventions in the literature to facilitate comparisons across interventions (Meier & Reinecke, 2021). Future research should attempt to capture characteristics related to SM interactions, messages, and participant engagement with interventions and their associated features. This could be addressed through the incorporation of mixed-methods analyses, which could provide context to observed changes (or lack of) in depression and anxiety outcomes. An indication of the content shared by users and their experiences of using these interventions would shed more light into how the development of interventions focusing on active SM use may benefit the wellbeing of its users.

Whilst this review suggests potential value in active SM use for improving depression and anxiety levels, the mechanisms underlying this relationship remain unclear. Given the significant amount of time spent on SM by AYA (Auxier & Anderson, 2021), it may be useful for healthcare professionals to explore the motivations and patterns of SM use through a framework such as the transdiagnostic cognitive-behavioural conceptualisation of the positive and negative roles of SM use on MH (Tibber & Silver, 2022). This model brings together core processes such as the individual's motivation (e.g. for social connection), level and types of purposeful engagement with SM, with the technical features afforded by the platform, to explain how SM use may impact upon an individual's MH. Such insights could inform the development of tailored SM interventions to promote wellbeing.

Moreover, efforts should be made to address the limitations identified in both the systematic review methodology and the broader research literature, such as the lack of well-matched control groups and small-to-moderate sample sizes. Enhancing the quality and diversity of research samples, incorporating longer follow-up periods, and exploring diverse MH outcomes beyond depression and anxiety are essential steps toward advancing knowledge in this field.

## **Conclusions**

This systematic review suggests that interventions that intentionally incorporate elements of active SM may have potential for improving depressive and anxiety symptoms. Yet, the ability to draw conclusions regarding the reasons for the observed changes is impeded by the considerable diversity in how studies report the description and utilisation of SM features. This review highlights opportunities for future research to address some of the identified limitations in this field, including increased capturing of participants' engagement to the intervention and mixed-methods approaches to contextualise findings. In addition, future research incorporating more comprehensive follow-up data, should aim to involve larger and more diverse samples to enhance the generalisability of findings concerning the effects of active SM use interventions on MH.

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## **Part Two: Empirical Paper**

Exploring the effects of a values-based micro-intervention for social media use  
on emerging adults: a randomised controlled trial

## Abstract

**Aims:** Given the emerging understanding that the manner in which social media (SM) is utilised can significantly impact the mental health (MH) of emerging adults, this study aimed to assess the effectiveness of a values-based micro-intervention, rooted in Acceptance and Commitment Therapy, in enhancing positive evaluations of social media use (PSMU), online values-consistent behaviour (VCB), and overall psychosocial functioning. Additionally, it sought to explore underlying mechanisms behind any findings.

**Methods:** Employing a randomised controlled trial design, participants (n=190) were randomly allocated to the experimental (n=82) or control (n=108) group. Participants underwent either a values-based or matched control intervention, respectively, followed by five minutes of social media use (SMU). Immediate and sustained (from one-week follow-up) effects were analysed in relation to self-reported measures of PSMU, online VCB, affective states, social connectedness (SC), and general wellbeing. Thematic and sensitivity analyses of participants' goals and values were conducted to explore reasons for findings/lack thereof.

**Results:** No significant changes were observed in PSMU, online VCB, SC, or wellbeing in the experimental group. However, there was a significant main effect of timepoint on positive ( $p < .001$ ,  $\eta^2_p = 0.92$ ) and negative ( $p = .039$ ,  $\eta^2_p = .023$ ) affect, with a significant group-timepoint interaction for negative affect ( $p = .036$ ,  $\eta^2_p = .023$ ). This indicated decreases in both types of affect post-intervention, with the control group also experiencing a decrease in positive affect. Nevertheless, the statistical significance of the impact on *negative* affect was lost after *Bonferroni* correction ( $\alpha = .01$ ). Secondary analyses revealed participants primarily aimed to enhance SC and reduce mindless SMU but did not exhibit shifts in VCB related to their most important or social values.

**Conclusion:** The current values-based micro-intervention did not improve PSMU, online VCB, positive affect, SC, or general wellbeing. The study discusses whether the intervention equipped emerging

adults with skills to align SMU with their values and identifies other potential avenues for future developments of the intervention.

## Introduction

Social media (SM) has become an integral part of daily life, encompassing a diverse array of online platforms and interactive technologies designed for social interaction and content sharing (Nesi et al., 2018). From social networking sites like Facebook and Instagram to messaging apps such as WhatsApp, the landscape of SM is widespread and continually evolving. With 96% of young people owning a smartphone, SM use (SMU) has surged amongst emerging adults, defined as individuals aged 18-29, with 90% engaging with at least one SM platform (Pew Research Center, 2018). This demographic constitutes the largest user group of SM, reflecting a 78% increase in SMU since its inception in 2005 (Perrin, 2015).

Emerging adulthood marks a critical life stage characterised by transitions in social, environmental, and occupational domains, including entry into higher education, the workforce, and establishment of financial independence (Arnett, 2007). These mounting pressures and increased reliance on SM mean that emerging adults are more susceptible to developing MH difficulties including anxiety, depression and substance misuse (Caspi et al., 2020). Given the frequency of SMU and prevalence of MH difficulties amongst emerging adults, research has begun to explore the mechanisms underlying the relationship between SMU and psychosocial functioning. This would inform the development of interventions aimed at promoting positive SMU (PSMU), which could, in turn, improve psychosocial wellbeing amongst SM users.

### **Social media use and mental health**

Existing research has tended to adopt a “causationist” approach, viewing SM as being inherently harmful or helpful, with a predominant focus on its negative impacts (Orben et al., 2020). This perspective often attributes the rise in MH difficulties amongst young people to *increased use* of SM (Twenge et al., 2018). This is aligned with consistent positive, albeit weak, correlations between

amount of SMU and MH difficulties yielded by meta-analyses and systematic reviews (e.g. Abi-Jaoude et al., 2020; Keles et al., 2019). Specifically, greater levels of SMU have been associated with increased depressive symptoms, poorer wellbeing and lower self-esteem (Woods & Scott, 2016).

On the other hand, SM can also provide opportunities for tangible rewards. These include access to learning resources (Bruguera et al., 2019), career opportunities (Tang et al., 2012), entertainment and peer support (Naslund et al., 2016). Additionally, for some individuals with pre-existing MH difficulties, SM can lend a supportive role through initiatives, online support groups, and access to specialised information (Naslund et al., 2016). Unsurprisingly, therefore, studies have also shown positive associations with greater SMU, such as reduced loneliness, and improved mood and wellbeing (Pittman & Reich, 2016). However, it is important to note that the literature has been largely cross-sectional in nature, such that causal attributions cannot be made.

Taking these mixed findings together, researchers have concluded that the impact of SMU on psychosocial outcomes must extend beyond the *amount* of SMU, into thinking about *why* and *how* it is used (Orben et al., 2020).

### **Mediating factors**

The Multidimensional Model of SMU (MMSMU; Yang et al., 2021) attempts to summarise the mediating pathways between SMU and wellbeing, as seen in the literature. It highlights three key dimensions of SMU, which include: (i) motives for SMU, (ii) activities performed on SM, and (iii) communication partners connected through SM.

#### *Motives*

According to the MMSMU, most motives for SMU can broadly be categorised as either *enhancement*-focused, whereby motives are aimed at improving existing circumstances such as strengthening relationships, or *compensation*-focused, whereby motives involve offsetting real or perceived

insufficiencies, or evading negative experiences, such as escapism from real life stressors (Yang et al., 2021). This aligns with the Uses and Gratifications Theory (U&GT; Katz et al., 1973), which suggests that individuals use SM to gratify their personal needs and goals, such as social interaction, entertainment and information-seeking. Enhancement motives have been linked to better wellbeing (Perugini & Solano, 2020), whilst compensation motives correlate with reduced wellbeing (Rae & Lonbord, 2015).

#### *(Inter)active use and communication partners*

The MMSMU distinguishes SMU into (inter)active and passive activities (Yang et al., 2021). Active use denotes the production or sharing of SM content, and can be interactive (e.g. conversing with others, commenting on posts) or non-interactive (e.g. uploading a status/picture/story). In contrast, passive use is when content is consumed rather than produced, e.g. browsing the Facebook newsfeed (Hancock et al., 2019).

Whilst passive SMU has typically been associated with poorer wellbeing, such as increased symptoms of depression and anxiety (Frison & Eggermont, 2017; Thorisdottir et al., 2019), active use has been linked to increased self-esteem, positive affect, social connectedness (SC) (Subrahmanyam et al., 2020) and reduced levels of depression and anxiety over time (Escobar-Viera et al., 2018). This could be explained by the interpersonal-connections-behaviour framework (ICBF; Clark et al., 2018), which proposes that SMU is beneficial/harmful to the individual to the extent that it satisfies core needs around acceptance and belonging. Furthermore, Cheung et al. (2011) found that the primary motivation that predicted intention to use Facebook amongst emerging adults pertained to the gratification of social needs, including social connectivity/enhancement. This appears to suggest that SMU may relate to psychosocial outcomes depending on the level and manner of online *interaction* from the user and others in their network. This notion is further elaborated upon by Yang et al. (2021)'s review, which found that engaging interactively with existing close contacts on SM (versus

weaker relational contacts), is associated with the greatest MH benefits, through the 'enhancement' motivation pathway associated with increased social support (Seo et al., 2016).

Overall, the literature seems to suggest that (inter)active SMU driven by motives for enhancement can be beneficial for psychosocial functioning. Given the increased reliance on SM, particularly amongst emerging adults, there is potential value in developing interventions that foster personal introspection about these dynamics. Such interventions could encourage more positive evaluations of one's own SMU, ultimately promoting psychosocial outcomes.

### **Scope for a values-based micro-intervention**

To promote mindful introspection on the activities and motives of SMU (Yang et al., 2021), a values-based intervention approach rooted in Acceptance and Commitment Therapy (ACT) holds promise. ACT emphasises acceptance of internal experiences, such as thoughts and emotions, whilst committing to actions aligned with one's values (Hayes et al., 1999). This framework is grounded in the concept of psychological flexibility (PF), which involves the ability to adaptively respond to changing internal or external challenges whilst staying focused on long-term values (Kashdan & Rottenberg, 2010). Within ACT, PF is facilitated through six core sub-processes: acceptance, cognitive defusion, present-moment awareness, self-as-context, values clarification, and committed action (Hayes et al., 1999). Research has shown that PF is associated with greater wellbeing (Fledderus et al., 2013), reduced symptoms of depression and anxiety (Kashdan & Rottenberg, 2010), and enhanced SC (Kashdan et al., 2006).

In the context of SMU, individuals may face challenges in maintaining PF due to the constant stream of information and the pressure to conform to societal norms. However, engaging in values-consistent behaviour (VCB) on SM has been linked to greater psychological wellbeing and life



satisfaction (Reinecke & Trepte, 2014). Furthermore, individuals with higher levels of PF tend to use SM in a more mindful and intentional manner, resulting in better MH outcomes (Levin et al., 2012). Moreover, studies indicate that employing a *micro*-intervention design could be especially attractive to emerging adults. Shorter, more focused interventions tend to align better with their preferences, as they are easily accessible and can seamlessly fit into their daily routines (Fuller-Tyszkiewicz et al., 2019). Micro-interventions offer immediate positive impacts on *targeted* areas of change, e.g. positive SMU (PSMU), and allow for testing isolated effects of brief activities (e.g. Beadman et al., 2015; Kamboj et al., 2017).

Whilst systematic reviews on their effectiveness are lacking, micro-interventions have been applied successfully in the area of ACT/values-based interventions. For example, Chase et al. (2013) found that psychology university students who underwent a single-session goal-setting training in combination with values-training had significantly improved grade-point averages over the following semester, whereas individuals who only performed goal-setting alone showed no difference. Positive effects were also shown in interpersonal behaviours in couples following a 15-minute micro-intervention focused on strengthening PF (Gloster et al., 2020).

The application of a values-based micro-intervention may therefore help align participants' online behaviour with their values (i.e. increase VCB), which could potentially improve MH outcomes.

### **Aims and hypotheses**

This study primarily aims to test the immediate and sustained effects of a values-based micro-intervention, developed by two previous trainees (Anna Taylor [AT] and Jennifer Thomson [JT]), on emerging adults' evaluation of their own PSMU, VCB, affect, general wellbeing and SC. Depending on outcomes from the primary aim, the secondary aim was to extend this thesis by exploring underlying

mechanisms if significant effects were found, or alternatively, explore possible reasons for null effects if these were instead found.

The following hypotheses were tested:

*Primary hypotheses (behavioural change outcomes):*

H1: Relative to the control group, the experimental group will report higher levels of PSMU at post-intervention (T2).

H2: Relative to the control group, the experimental group will report higher levels of PSMU at follow-up (T3).

H3: At T3, the experimental group will report higher levels of online VCB relative to the control group, and relative to their own scores at baseline (T1).

*The following secondary hypotheses (psychosocial outcomes) relate to potential ripple effects resulting from changes in underlying behaviour:*

H4: Relative to the control group, the experimental group will report higher levels of positive affect at T2 than at T1.

H5: (a) Relative to the control group, the experimental group will report higher levels of SC at T2 and (b) T3 than at T1.

H6: Relative to the control group, the experimental group will report greater levels of general wellbeing between T1 and T3.

H7: In the experimental group, baseline PF scores will correlate with any changes seen in H1-H6.

## Method

The study received ethical approval from the University College London (UCL) Research and Ethics Committee (Project ID: 22087/001) (see Appendix C).

### Joint thesis

The present study builds upon the work of two previous trainees (AT and JT), who separately investigated the immediate and sustained impacts of the intervention (see Appendix D). AT focused on immediate effects, comparing T1 and T2 data on PSMU, affect, and SC, whilst JT examined sustained effects by comparing T1 and T3 data on VCB, general wellbeing, and SC.

This study extends their work with additional recruitment to increase the sample size, and an additional aim of (i) exploring the micro-intervention's impact (and underlying mechanisms of change) on key outcome variables; or (ii) conducting sensitivity analyses to understand null findings, as relevant. Pre-registration on the Open Science Framework (OSF) was completed (<https://osf.io/en4wy>).

Supervised by Marc Tibber (MT), the intervention was designed by MT, AT and JT (with input from the author), with data jointly collected by AT, JT and the author from July 2022 to November 2022. The author extended recruitment alone from December 2022 to February 2024 to increase the sample size for the current thesis and attain the pre-determined level of power. The author performed all analyses on the final/full dataset, as well as all sensitivity analyses to address the secondary aim.

## **Participants**

### *Recruitment*

Participants were recruited from July 2022 to February 2024 via an advert (Appendix E) posted on SM sites (e.g. Instagram, Facebook and Twitter), word of mouth and flyers around campus.

Participants had the option to enter a prize draw to win one of ten £25 Amazon vouchers after full completion of T1-T3 measures.

### *Eligibility criteria*

Inclusion criteria included being aged 18-29 years, user of at least one SM platform (typically once per day minimum) and having a sufficient grasp of English to engage with the study.

## **Consent process**

Once participants accessed the online study link, they were provided with the participant information sheet (Appendix F), which included contact details of the research team. Participants were then directed to give their informed consent (Appendix G) via Research Electronic Data Capture (Redcap; Harris et al., 2009), a secure web application compliant with General Data Protection Regulation.

## **Study design**

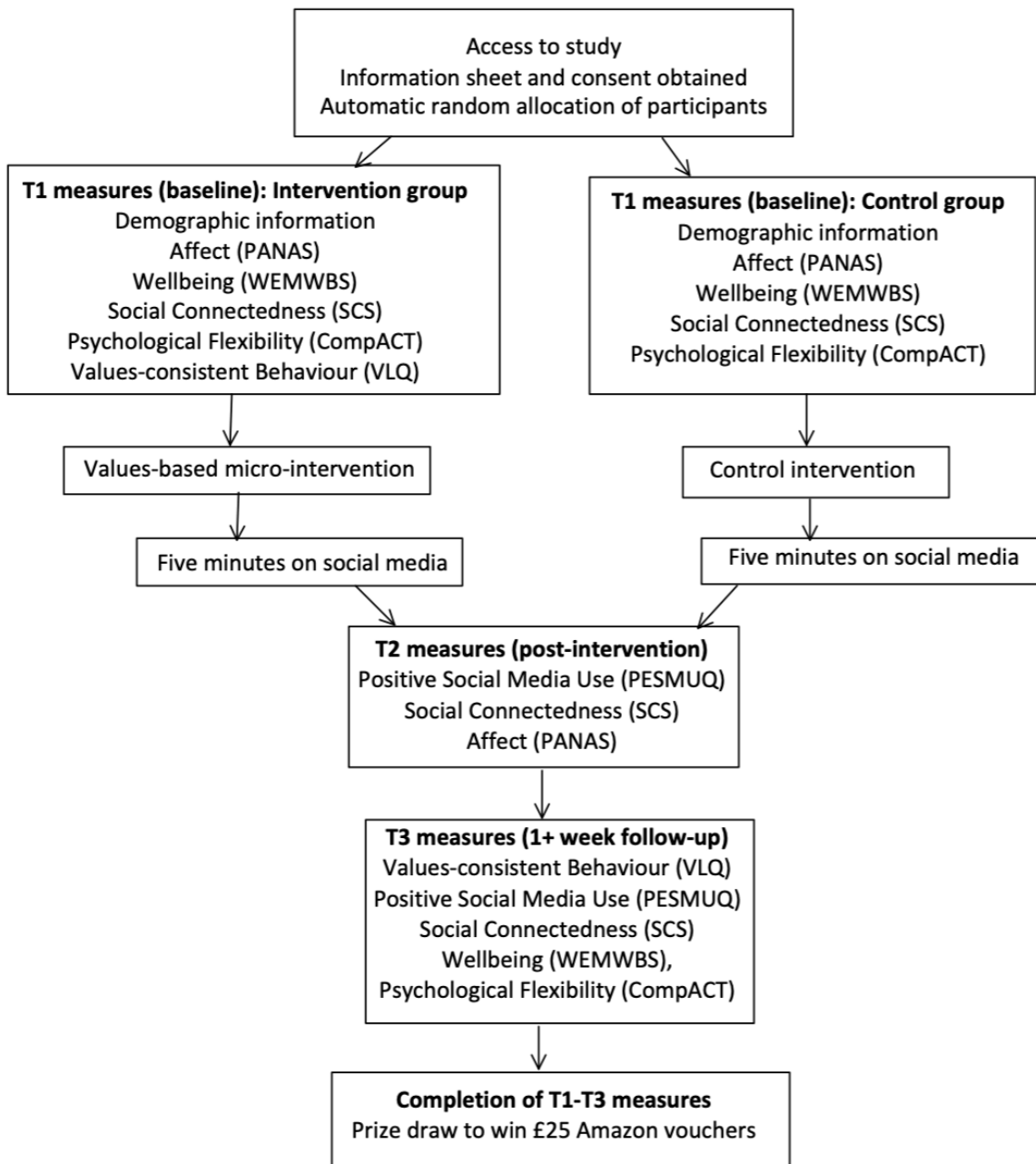
The study employed a parallel-group randomised controlled trial (RCT) design with time (T1, T2, T3) as a within-participants independent variable, and group membership (experimental intervention vs. control) as a between-participants independent variable.

Participants accessed the online study, hosted by Qualtrics, via a web or QR link. Following this, participants were randomly assigned to either the experimental or control condition. Initially, all participants completed a battery of demographic and baseline (T1) measures, followed by either an

experimental (values-based intervention) or a control condition, and were then asked to engage in five minutes of naturalistic SMU (specific instruction: “Now please use the social media platform of your choice for the next 5 minutes in any way you wish to.”). Following this, participants immediately completed post-intervention (T2) measures. A week later, they were contacted via email to complete T3 measures.

Participants in the experimental group were required to complete measures on affect, general wellbeing, SC, PF and VCB at T1 (see Figure 1). The control group completed the same measures, minus information on their VCB to avoid priming of VCB in these participants (deemed a key component of the values-based intervention). Immediately after the experimental/control intervention and brief exposure to SMU (T2), all participants were asked to complete measures on PSMU, SC and affect.

At one week follow-up (T3), all participants were invited to respond to the same measures asked at T1 (minus the measure for “affect”), with the addition of “VCB” for the control condition, and the measure for PSMU for both conditions.



**Figure 1**

*Flowchart of assessment procedure upon recruitment of participants.*

## Interventions

The experimental and control interventions, developed by AT, JT, and MT, underwent refinement based on feedback from four ACT peer-reviewed trainers and piloting with five emerging adults.

The values-based micro-intervention drew from ACT and underlying theory, as well as prior online micro-interventions exploring the influence of values training on behaviour change (Chase et al., 2013; Gloster et al., 2020). The experimental group initially received psychoeducation around values, including what they are (from an ACT perspective) and how they could be useful for SMU. This was followed by a “*values clarification*” exercise, during which participants completed the Valued Living Questionnaire (VLQ; Wilson et al., 2010), which helps participants to identify their values and assess the degree to which they are living in line with these across 12 valued domains. As detailed below, the VLQ was adapted such that participants were asked for their ratings across both i) *online* and ii) *offline* contexts over the past week. Subsequently, participants were asked to identify up to three values-consistent goals related to their SMU (“*committed action task*”). Participants then underwent a five-minute naturalistic exposure to SM before immediately completing T2 measures.

The control group was created based on Katz et al.'s (2016) methodology and was matched closely to the experimental intervention with respect to length, format and content, without the inclusion of a values-clarification or committed action task. Specifically, participants were presented with psychoeducation around the significance of colours in daily life and their presence on SM. They were then asked to rate their favourite colours and identify how frequently they had seen the list of 12 colours across both online and offline contexts over the past week. Thereafter, participants were asked to list three things that they associated with their favourite colours and design a colour scheme for a hypothetical website. As with the experimental group, participants were asked to use SM for five minutes before completing the same T2 measures. See Appendices H and I for full intervention details.

## Data storage

To preserve participant anonymity, information linked to all participants was stored securely on UCL Data Safe Haven (DSH), accessible only to the research team. Unique identifier codes were assigned to link pseudonymised data across databases, facilitating the identification of participants for T3 measures and the matching of T1, T2 and T3 datasets for analysis.

## Data collected

*Demographic information* gathered included participants' age, gender and ethnicity. Participants were also asked whether they were a user of SM (yes/no) and how many minutes they spend on SM on a typical day. The latter was collected due to purported links between the level of SMU and wellbeing (e.g. Lee et al., 2022). In addition, the following measures were administered:

*Positive social media use* was measured using the Positive Evaluation of Social Media Use Questionnaire (PESMUQ). This measure draws on an ACT-consistent conceptualisation of values and was developed by the research team to assess the extent to which participants' self-perceived SMU facilitated them to live a positive and values-consistent life. Two version of the PESMUQ were created: (i) a discrete event version administered at T2, which measured the degree to which participants had been using SM in line with their values following the SM exposure task (e.g. *"Reflecting on your social media use in the last 5 min to what extent do you think you were using social media in a way that is good for your mental health and wellbeing?"*), and (ii) the general event version administered at T3, which evaluated their general SMU (e.g. *"To what extent do you think social media on balance, is good for your mental health and wellbeing?"*).

Participants rated on a scale from 1 (strongly disagree) to 7 (strongly agree) the extent to which they resonated with the six items which pertained to three domains: (i) general wellbeing, (ii) values-aligned living, and (iii) connectedness. See Appendix J for full details. Ratings for each item were



summed to produce a global score from 6-42, with higher scores reflecting greater PSMU. Notably, the PESMUQ was not administered at baseline to prevent priming effects of values-consistency in the control group. Whilst details of the PESMUQ have not been published yet, in a study of nearly 7,000 emerging adults using a Chinese-translation version of the PESMUQ, the questionnaire showed high internal consistency (Cronbach's  $\alpha=0.9$ ) and a single factor solution (Tibber et al, under review).

*Values-consistent behaviour* was assessed using the Valued Living Questionnaire (VLQ; Wilson et al., 2010). Items captured the extent to which 12 different domains (e.g. family, work, spirituality) are deemed important to participants through Likert-scale ratings ranging from 1 (not at all) to 10 (extremely) [*Importance rating*]. On another 10-point Likert-scale, participants were then asked to rate how well their behaviours had lined up with their values in the past week, for each of the same 12 domains, using a Likert-scale ranging from 1 (completely inconsistent) to 10 (completely consistent) [*Consistency rating*]. Importance and consistency scores therefore separately ranged between 12-120. In an adaptation from the original VLQ, participants gave such consistency ratings for each domain in terms of their i) *online* life, as well as their ii) *offline* life. Finally, a VLQ *composite* score, which is recommended for research and clinical use (Wilson et al., 2010), was obtained by multiplying the importance rating by the corresponding consistency rating, for each of the 12 domains. This ranged from 10-100. Items were rated as N/A if they were perceived as non-applicable to participants.

The validity of the VLQ (original version) has been supported across studies, with acceptable internal consistency (Cronbach's  $\alpha \geq 0.7$ ) across normative and distressed samples (Cotter, 2011; Wilson et al., 2010). Participants in the control group were not administered the VLQ at baseline to avoid priming of VCB in these participants, which could potentially influence the effects of the intervention.

*Affect* was measured using the *Positive and Negative Affective Schedule-Short Form* (PANAS-SF; Watson et al., 1988). Participants were asked to rate on a Likert scale from 1 (very slightly or not at

all) to 5 (extremely) the extent to which they felt 20 different feelings/emotions in the present moment. Scores from the 10 positive (e.g. 'excited') and 10 negative (e.g. 'upset') adjectives were then summed respectively to produce separate 'positive affect' and 'negative affect' subscale scores. Scores therefore range from 10-50 for the positive and negative affect subscales separately. The PANAS subscales have shown good validity and internal reliability (Cronbach's  $\alpha \geq 0.8$ ) (Watson et al., 1998). This measure has demonstrated sensitivity to changes from interventions and life events, indicating its utility in tracking affect over time (Thompson, 2007; Watson & Clark, 1997).

*Social Connectedness* was assessed using the eight-item Social Connectedness Scale (SCS; Lee & Robbins, 1995). Participants individually rated items on a Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree) the degree to which they felt connected with their social environment (e.g. "I feel so distant from people"). Ratings across items were summed to derive a total score ranging from 8-48, with a higher score indicating greater SC to others. The scale is widely used across both online and offline contexts, with evidence of strong validity and internal reliability (Cronbach's  $\alpha = 0.91$ ) and a good test-retest correlation over a two-week period ( $r=.96$ ; Lee & Robbins, 1995).

*General wellbeing* was measured using the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS; Tennant et al., 2007). The 14-item scale covers various areas of subjective wellbeing and psychological functioning. Participants rated on a five-point Likert scale from 1 (none of the time) to 5 (all of the time), the frequency in which they resonated with the items (e.g. "I've been feeling useful") over the last two weeks. A total score from 14-70 was derived by summing the scores for each item, with higher scores reflecting greater wellbeing. The scale has evidenced strong validity and internal reliability (Cronbach's  $\alpha = 0.9$ ) amongst both student and adult samples (Tennant et al., 2007).

*Psychological flexibility* was measured using the Comprehensive Assessment of Acceptance and Commitment Therapy processes (CompACT) questionnaire (Francis et al., 2016). Participants rated on a scale from 0 (strongly disagree) to 6 (strongly agree) their alignment with each of the 23 items relating to PF (e.g. “I work hard to keep out upsetting feelings”). After reverse scoring of 11 items, ratings were summed to yield an *overall PF score* (ranging from 0-138), in addition to three sub-scale scores representing different facets of PF: openness-to-experience (CompACT-OE), behavioural awareness (CompACT-BA), and valued action (CompACT-VA). Higher scores are reflective of greater levels of PF. The scale has been used to measure general PF across a range of contexts and has been effective in evaluating interventions that aim to promote PF, including ACT, and exhibits strong internal reliability across all subscales (Cronbach’s  $\alpha=.85-91$ ) (Hajloo et al., 2022).

### **Sample size**

The study's sample size determination was comprehensive, accounting for planned statistical analyses (including independent and paired-samples t-tests and mixed ANOVAs) and complexities of mediation pathway analysis to understand any underlying significant results.

Power calculations using G Power indicated that a minimum of 138 participants was needed to achieve 80% power for detecting interaction effects, between-group differences, and within-group effects, all with an effect size of  $d = 0.5$ , and  $\alpha = 0.05$ , and  $1-\beta = 0.8$ .

Whilst there is no consensus on sample size calculation for path analyses/structural equation modelling, a rule of thumb suggests a minimum of 10 participants per included variable (Nunnally, 1967). Considering the inclusion of seven variables including ‘group membership’ (intervention vs. control), this implies a minimum of 70 participants. Other recommendations suggest minimum sample sizes ranging from 100-200 participants (e.g. Hoogland & Boomsma, 1998;).

Consequently, the study aimed to analyse complete cases with a sample size of 200 participants to ensure robust statistical power and facilitate exploration of underlying pathways through mediation analyses if significant findings were found.

### **Statistical methods**

Data were analysed using SPSS version 29. An adjusted alpha criterion level of .01 was used for the primary analyses, reflecting Bonferroni correction for five main outcome variables (i.e. PSMU, VCB, affect, SC, general wellbeing).

Analyses explored changes in PSMU, VCB, affect, SC and wellbeing across three timepoints (T1, T2, T3) and between groups, utilising t-tests and ANOVAs. Mixed ANOVAs compared effects across groups, timepoints (main effects), and interactions between group and timepoints, whilst independent-samples and paired-samples t-tests examined inter-group differences at single timepoints and changes across time within groups, respectively. Pearson's correlations were conducted to assess associations between baseline PF and change scores to test the idea that PF may limit/facilitate behavioural change.

Variables were assessed for normality via eyeballing of histograms, assessments of skewness and kurtosis, and single-sampled Kolmogorov-Smirnov (K-S) tests, with linearity evaluated through eyeballing of scatterplots. Whilst non-parametric tests are common for non-normally distributed data, they can become more sensitive to minor distribution differences with increasing sample sizes (Fagerland, 2012). However, the central limit theorem suggests normality in sample means with large samples ( $n > 30$ ), favouring parametric tests. Given our substantial sample size ( $n = 190$ ), parametric tests were used and reported throughout, although non-parametric tests were also conducted, with no impact on findings.

Outliers exceeding three z-scores from the mean were identified. Where no effects were present, analyses were repeated on data without outliers and on data from participants who completed T1-T3 measures within a defined temporal window only (<31 days). Non-significant results from these are not reported in the text in detail but are presented in Appendix K.

Complete case analyses were conducted and are presented in the main results. To address any potential bias that might arise from relying solely on complete case data, additional analyses were re-run using all available data at each time point, ensuring that participants who, for example, did not complete T3 were still included in the T1/T2 analyses. These supplementary analyses produced findings consistent with the main results, and further details are provided in Appendix L.

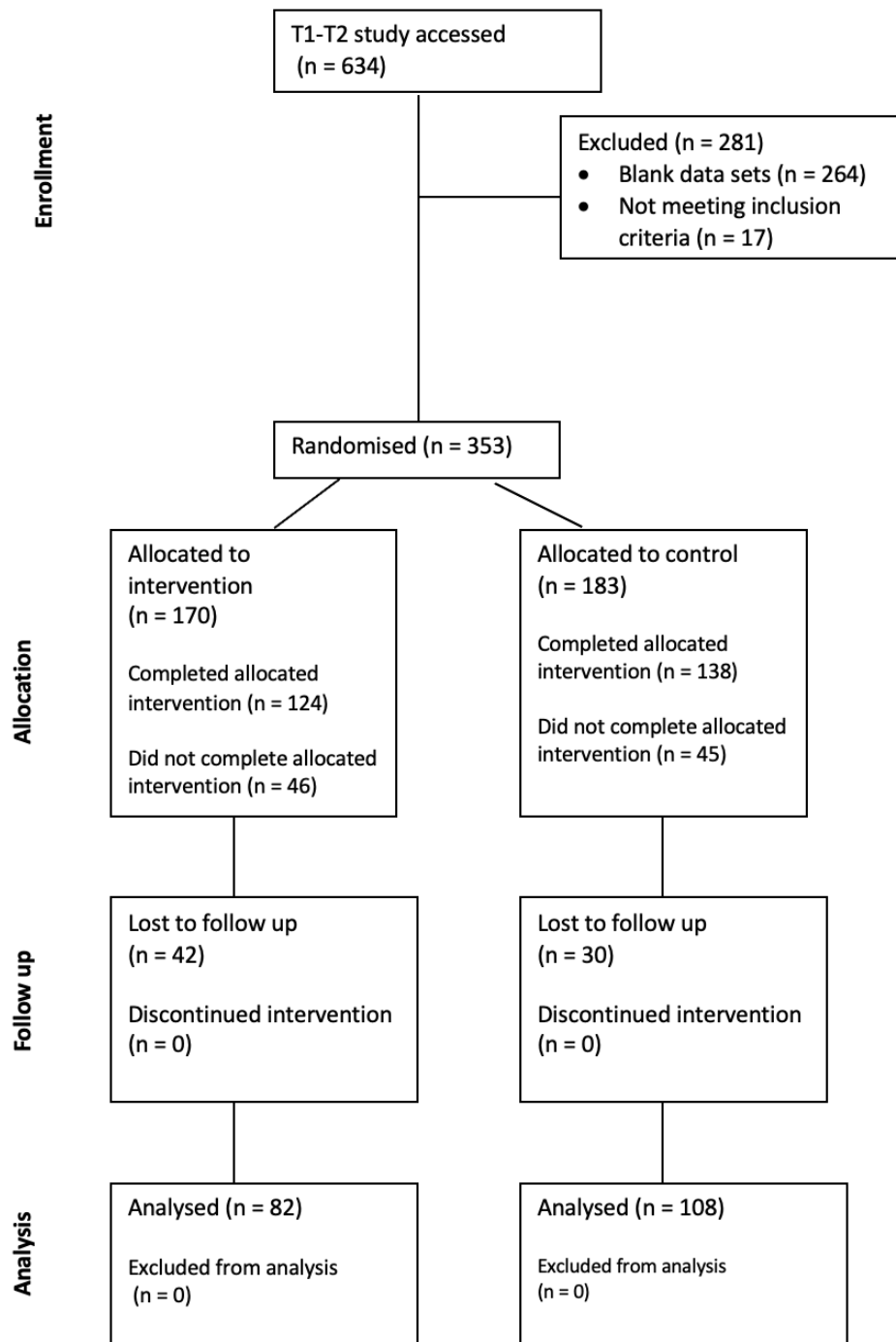
Given the high attrition rate between T1 and T3, additional multivariate logistic regression analyses were conducted as a further check on the robustness of the complete case analysis findings to determine whether baseline scores on core measures (PANAS subscales, WEMWBS, SCS, and CompACT), as well as demographic factors (age, sex, ethnicity), predicted completion of the PESMUQ at T2 (Model 1), PESMUQ at T3 (Model 2), and VLQ at T3 (Model 3). These variables were chosen as predictors because they were measured in both groups at baseline. A binary outcome variable (0 = did not complete the measure; 1 = completed the measure) was used in these individual models.

Following null findings, sensitivity/additional analyses were conducted to explore possible underlying reasons. Specifically, thematic analysis of participants' goals from the 'committed action task' was performed to understand participants' intended goals and hence, inform future iterations of the intervention. Additionally, VCB was re-examined focusing on individuals' 'most important' values and the 'social' value from the VLQ, addressing the possibility of concealed shifts in pertinent values despite overall non-significant changes.

## Results

### Participant flow

A flow chart presented in Figure 2 shows the progress of completers and non-completers through each phase of the study. In total, 634 participants accessed the study, 264 of whom did not progress beyond the information/consent process and a further 17 were excluded due to not meeting inclusion criteria. Of the remaining 353 participants (55.7%) who were randomised to either the experimental (48.2%) or control group (51.8%), 91 were excluded due to incompleteness of T1 and T2 measures (25.8%). A further 72 participants did not complete T3 measures and were excluded from final analyses. Complete case analyses were therefore run on a sample of 190 participants, which represented 53.8% of individuals who were randomised to either the experimental or control group.



**Figure 2**

*Flowchart of participation attrition and retention*

### Sample characteristics

Table 1 provides an overview of the sample demographics of the 190 participants included in the study. Participants had a mean age of 26.2 years (SD=2.63), the majority of whom were female

(77.9%) and white (74.2%). All participants were users of SM, spending a mean of 131 minutes a day on SM across the full sample (SD=87). The mean number of days between T1-T3 completion was 16.3 days (SD=20.3).

**Table 1**

*Sample characteristics*

T1-T3 characteristics		Intervention (n=82)		Control (n=108)		Full sample (n=190)	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Sex	Female	65	79.3	83	76.9	148	77.9
	Male	17	20.7	25	23.2	42	22.1
Ethnicity	White	59	72.0	82	75.9	141	74.2
	Mixed	5	6.10	2	1.85	7	3.68
	Any Other Mixed Background	3	3.66	4	3.70	7	3.68
	Asian or Asian British	12	14.6	12	11.1	24	12.6
	Black or Black British	0	0	6	5.56	6	3.16
	Any Other Ethnic Group	2	2.44	1	0.93	3	1.58
	Prefer not to say	1	1.22	1	0.93	2	1.05
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Minutes spent on SM per day		111.1	64.4	145.4	98.6	130.7	87.0
Age		26.2	2.39	26.2	2.82	26.2	2.63
Days between T1-T3 completion		16.1	18.2	16.5	21.8	16.3	20.3

*Note.* SM=social media.

**Group differences**

Despite the random allocation of participants to groups, the control group was larger than the experimental group (n=108 and 82, respectively). Independent samples t-tests and chi-square tests



were conducted to explore any statistically significant differences in demographics and baseline measures between the groups.

Chi-square tests indicated no significant differences in gender or ethnicity between the two groups ( $p > .05$ ) (See Table 2). Independent samples t-tests also revealed no significant differences between the groups in age or days between T1-T3 completion ( $p > .05$ ). However, the control group appeared to spend significantly more minutes per day on SM ( $M=145.6$ ,  $SD=98.6$ ) than the experimental group ( $M=111.1$ ,  $SD=64.4$ ), ( $t(188)=2.75$ ,  $p=.007$ ,  $d=0.4$ ), reflecting a small-to-medium effect size (See Table 3).

Independent samples t-tests were also run on T1 core measures. No significant group differences were observed at T1 for PANAS positive affect ( $t(188)=-.283$ ,  $p=.777$ ), PANAS negative affect ( $t(188)=.953$ ,  $p=.342$ ), WEMWBS ( $t(188)=-1.65$ ,  $p=.101$ ), SCS ( $t(188)=-.498$ ,  $p=.619$ ) or ComPACT ( $t(188)=1.26$ ,  $p=.211$ ) scores. See Table 4 for means and standard deviations.

**Table 2***Chi-square analyses: between-group differences in gender and ethnicity*

		Intervention (n=82)		Control (n=108)		$\chi^2$	df	p
		n	%	n	%			
Gender	Female	65	79.3	83	76.9	0.158	1	.691
	Male	17	20.7	25	23.1			
Ethnicity	White	59	72.0	82	75.9	8.11	6	.230
	Mixed	5	6.1	2	1.9			
	Any Other Mixed Background	3	3.7	4	3.7			
	Asian or Asian British	12	14.6	12	11.1			
	Black or Black British	0	0	6	5.6			
	Any Other Ethnic Group	2	2.4	1	0.9			
	Prefer not to say	1	1.2	1	0.9			

**Table 3***Independent samples t-test results: between-group differences in age, minutes spent per day on social media and days between T1-T3*

	Intervention (n=82)		Control (n=108)		t	df	p	Cohen's d
	M	SD	M	SD				
Age	26.2	2.39	26.2	2.82	.141	188	.888	0.02
Minutes spent on SM	111.1	64.4	145.6	98.6	2.75	188	.007	0.40
Days between T1 and T3	16.1	18.2	16.5	21.8	.153	188	.879	0.02

*Note.* SM=social media.

**Table 4**

Mean and standard deviations for PESMUQ, VLQ, PANAS, SCS, WEMWBS, and CompACT scores across T1-T3.

	T1		T2		T3	
	Intervention (n=82)	Control (n=108)	Intervention (n=82)	Control (n=108)	Intervention (n=82)	Control (n=108)
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
PESMUQ <sup>a</sup>	-	-	26.8 (7.96)	25.7(7.40)	27.1 (7.05)	27.7 (6.70)
VLQ <sup>b</sup> – Online composite mean	46.0 (16.1)	-	-	-	46.9 (15.3)	48.2 (13.1)
PANAS <sup>c</sup> – Positive Affect	25.3 (7.99)	25.6 (8.20)	23.0 (8.79)	24.4 (9.26)	-	-
PANAS – Negative Affect	15.8 (6.51)	16.8 (8.13)	14.4 (6.31)	16.8 (8.74)	-	-
SCS <sup>d</sup>	36.4 (9.20)	35.7 (10.5)	36.9 (9.99)	36.1 (10.4)	36.7 (10.3)	36.8 (9.62)
WEMWBS <sup>e</sup>	49.2 (7.32)	47.2 (8.78)	-	-	48.5 (7.85)	47.4 (9.16)
CompACT <sup>f</sup> - total	51.2 (19.2)	54.93(21.2)	-	-	52.0 (19.5)	54.7 (19.7)

Note: The control group did not receive the VLQ at T1.

<sup>a</sup>PESMUQ: Positive Evaluation of Social Media Use Questionnaire

<sup>b</sup>VLQ: Valued Living Questionnaire

<sup>c</sup>PANAS: Positive and Negative Affective Schedule-Short Form

<sup>d</sup>SCS: Social Connectedness Scale

<sup>e</sup>WEMWBS: Warwick-Edinburgh Mental Wellbeing Scale

<sup>f</sup>CompACT: Comprehensive Assessment of Acceptance and Commitment Therapy

### **Data distributions and attrition analyses**

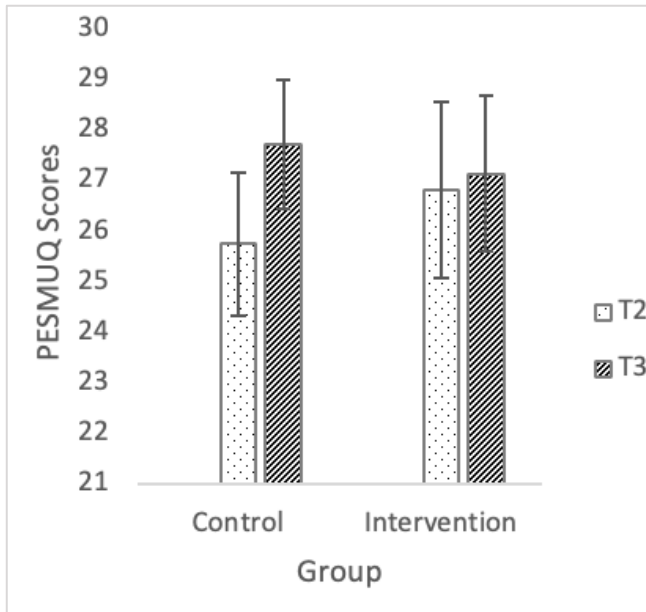
All variables exhibited skewness and kurtosis values within the acceptable range of  $\pm 2$  (George & Mallery, 2010). However, the assumption of normality was violated, as reflected by significant K-S test statistics ( $p < .05$ ) for the following variables: SCS (both groups at T1, T2 and T3) and PESMUQ (experimental group at T2 and T3)(see Appendix M).

Findings from the multivariate logistic regression analyses showed that baseline scores on the PANAS subscales, WEMWBS, SCS, CompACT, and demographic factors (age, sex, ethnicity) did not significantly predict participant attrition/completion of the PESMUQ at T2 (Model 1), PESMUQ at T3 (Model 2), or VLQ at T3 (Model 3). Across all models, none of the baseline or demographic factors were reliable predictors of participant retention ( $ps > .05$ ; see Appendix N). These non-significant findings suggest that neither the baseline nor demographic factors were reliable predictors of dropout, suggesting that attrition may have occurred at random.

### **Primary analyses: experimental versus control group comparisons**

#### *Positive social media use*

To test the hypotheses (H1-H2) that the experimental group would report higher levels of PSMU at T2 and T3 than the control, two separate independent samples t-tests were performed on mean PESMUQ scores. There were no significant differences between the groups at T2 (Intervention  $M=26.8$ ,  $SD=7.96$ , control  $M=25.7$ ,  $SD=7.40$ ) ( $t(167.67)=-.944$ ,  $p=0.342$ ), nor at T3 (Intervention  $M=27.1$ ,  $SD=7.05$ , control  $M=27.7$ ,  $SD=6.70$ ), ( $t(169.52)=0.527$ ,  $p=0.599$ ) (see Table 4; Figure 3). These findings remained consistent when re-analysed using all available data (Appendix L).

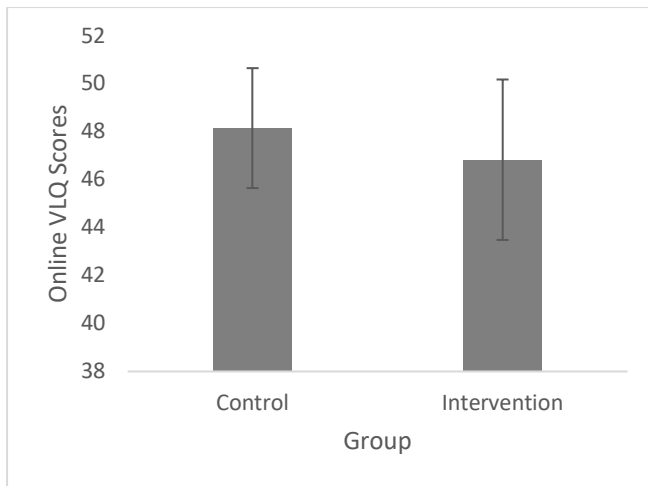


**Figure 3**

*Group means and standard errors (error bars) of PESMUQ scores at T2 and T3*

*Values-consistent behaviour*

To test the hypothesis (H3) that the experimental group would report higher levels of *online* VCB than the control group at T3, an independent samples t-test was conducted. No significant difference was found between VLQ online composite scores for the control ( $M=48.2$ ,  $SD=13.1$ ) and experimental ( $M=46.9$ ,  $SD=15.3$ ) groups ( $t(188)=-0.640$ ,  $p=0.523$ ) (Figure 4), nor for *offline* VCB scores (control  $M=52.7$ ,  $SD=13.8$ , intervention  $M=50.2$ ,  $SD=13.8$ ) at T3 ( $t(188)=1.25$ ,  $p=.213$ ). These results were upheld in the re-analysis that included all available data (Appendix L).

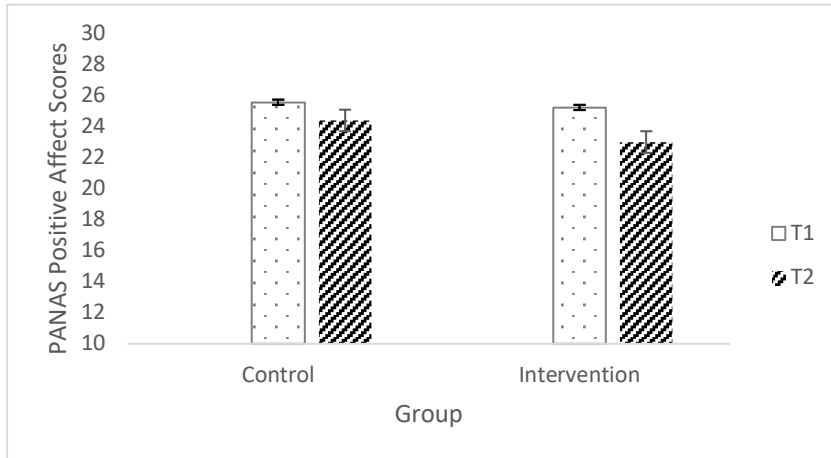


**Figure 4**

*Group means and standard errors (error bars) of online VLQ scores at T3*

#### *Affect*

To test the hypothesis (H4) that the experimental group would report greater positive affect than the control group at T2 than at T1, a mixed ANOVA was conducted. Results found a significant main effect of timepoint ( $F(1,188)=18.9, p<.001$ ), signifying a significant decrease in positive affect from T1 to T2, with comparable drops seen in both groups. With an effect size of  $\eta^2_p=0.92$ , a large amount of the variance in positive affect could be explained by the model. However, there were no significant main effects of group ( $F(1,188)=0.522, p=0.471$ ) or interaction between group and timepoint ( $F(1,188)=1.82, p=.179$ ) (Table 4; Figure 5).

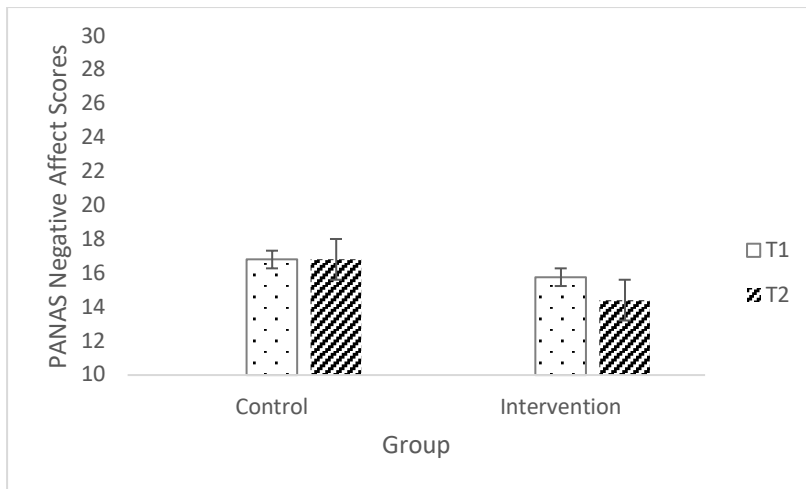


**Figure 5**

*Group means and standard errors (error bars) of PANAS positive affect scores at T1 and T2*

Although not a focus in the present study, a mixed ANOVA was also run for negative affect scores. Whilst no significant main effect of group was found ( $F(1,188)=2.60$ ,  $p=.109$ ,  $\eta^2_p = .109$ ), significant main effects of timepoint ( $F(1,188)=4.33$ ,  $p=.039$ ,  $\eta^2_p = .023$ ) and a significant interaction between group and timepoint ( $F(1,188)=4.45$ ,  $p=.036$ ,  $\eta^2_p = .023$ ) were observed, though effect sizes were small. This indicated a statistically significant decrease in negative affect from T1 to T2 across the entire sample, with the decrease only evident in the experimental group, whilst levels remained unchanged for the control group. However, these findings were rendered non-significant after adjusting for multiple comparisons (Table 4; Figure 6).

All conclusions pertaining to affect remained unchanged when the analyses were repeated with all available data (Appendix L).



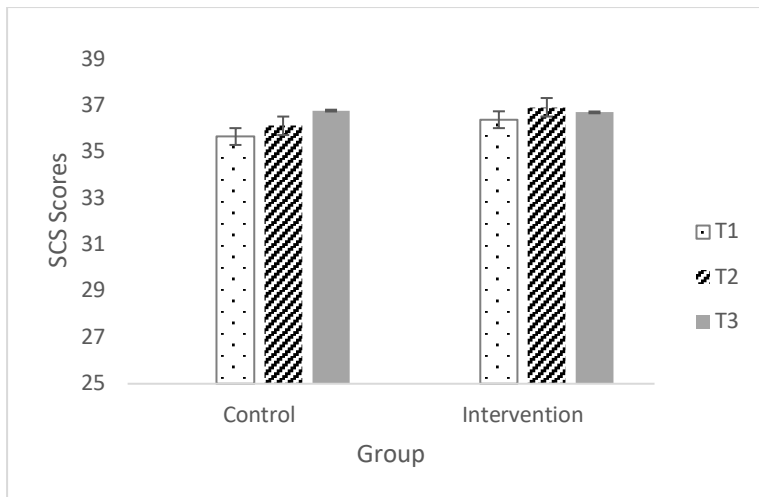
**Figure 6**

*Group means and standard errors (error bars) of PANAS negative affect scores at T1 and T2*

#### *Social connectedness*

A mixed ANOVA was conducted to test the hypothesis (H5) that the experimental group would exhibit higher levels of SC at T2 and T3 compared to T1, relative to the control group. Results revealed no significant main effect of timepoint ( $F(2,376)=1.18, p=0.309$ ) or group ( $F(1,188)=0.126, p=.723$ ), and no significant interaction between group and timepoint ( $F(2,376)=0.514, p=0.598$ ) (Table 4; Figure 7). These findings remained consistent when re-analysed using all available data (Appendix L).



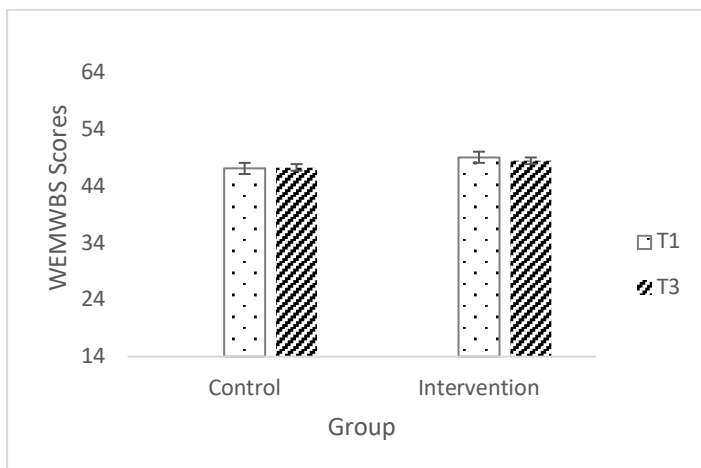


**Figure 7**

*Group means for SCS scores at T1, T2 and T3*

*Wellbeing*

A mixed ANOVA was performed to test the hypothesis (H6) that the experimental group would report greater wellbeing than the control group at T3 than at T1. Results revealed no significant main effect of timepoint, ( $F(1,188)=0.332, p=.565$ ), or group, ( $F(188)=1.798, p=.182$ ) and no significant interaction between group and timepoint, ( $F(1,188)=1.132, p=.289$ ) (Table 4; Figure 8). When re-analysed with all available data, these findings remained consistent (Appendix L).



**Figure 8**

*Group means for WEMWBS scores at T1 and T3*

## Primary analyses: pre-post comparisons and correlations

### *Values-consistent behaviour*

A paired-samples t-test was conducted to test the hypothesis (H3) that the *experimental group* would report higher online VCB scores at T3 than at T1, i.e. that the intervention would induce a shift across time in behaviour. There was no significant difference between VCB scores for the experimental group at T1 ( $M=46.0$ ,  $SD=16.1$ ) and at T3 ( $M=46.9$ ,  $SD=15.3$ ) ( $t(81)=-.753$ ,  $p=.454$ ) (Table 4). There were also no significant differences between *offline* VCB scores in the experimental group at T1 ( $M=49.8$ ,  $SD=14.2$ ) and at T3 ( $M=50.2$ ,  $SD=13.8$ ) ( $t(81)=-.345$ ,  $p=.731$ ). These results were upheld in the re-analysis that included all available data (Appendix L).

### *Psychological flexibility*

Pearson correlations were performed to assess potential associations between PF (CompACT scores) at T1 and change scores in key outcome variables (VLQ-online composite, PANAS, WEMWBS and SCS scores) in the experimental group. Outcome change scores were calculated by subtracting individuals' T1 scores from T3 scores for each respective measure.

There were no significant correlations between CompACT scores at T1 and changes in VLQ ( $r(80) = 0.12$ ,  $p=.280$ ), PANAS ( $r(80) = -0.02$ ,  $p=.829$ ), WEMWBS ( $r(80) = -0.19$ ,  $p=.080$ ), or SCS scores ( $r(80) = -0.09$ ,  $p=.442$ ). There were also no significant associations with change scores for any of the subscales of the CompACT: CompACT-OE, CompACT-BA, CompACT-VA ( $p>0.05$ ) (See Appendix O). The results were upheld even after re-analysing with all available data (Appendix L). These findings suggest that any changes in VCB, positive affect, general wellbeing and SC were not associated with higher or lower levels of PF.

## **Secondary analyses**

Due to the lack of significant effects found from the micro-intervention, pathway analyses to explore potential mechanisms of change were not undertaken. However, various sensitivity analyses were performed to try and better understand the lack of significant findings.

Specifically, in order to understand why shifts may not have been elicited, we wanted to explore the nature of goals (and associated domains) identified for change, along with investigating whether there were corresponding changes in a subset of value domains (i.e. the most important domains, as defined by each individual, as well as the social domains, which one might expect to be most relevant to SMU).

### ***Thematic analysis of identified goals***

To explore the nature of participants' values-driven goals, a thematic analysis was undertaken of the qualitative data given by the intervention group (169 individual goals), where participants were asked to identify up to three values-consistent goals ('committed action task') that they would like to work on. Qualitative data were analysed by the author, using a theoretical thematic analysis (Braun & Clarke, 2006), with themes cross-coded by the research supervisor. Responses were collated, allowing familiarisation of the data for coding. Themes were then derived from patterns within the dataset, refined, and ultimately defined. See Appendix P for the full coding.

#### **Theme 1: Online behaviour changes**

The majority of identified goals related to changes in online behaviour (n=115; 68%); within this, four sub-themes were identified. The most common sub-theme related to "social connection", with 59 responses indicating a desire to build on SC with their existing network, e.g.:

*“Message a family member daily.”*

*“Check in with close friends once a week.”*

Twenty responses, clustered under a second sub-theme related to changing the “*nature of SM engagement*”, with participants typically wanting to engage less mindlessly, or else wishing to engage in more *active*, intentional posting of content, e.g.:

*“Less mindless scrolling.”*

*“Post a new photo weekly on my creative Instagram account.”*

Twenty goals related to a third sub-theme of changing “*engagement with specific content*”, including keeping up to date with more educational or hobby-related pages, or else unfollowing or reporting unhelpful content, e.g.:

*“Follow an educational Instagram page.”*

*“Report all hate comments I come across.”*

Finally, 16 goals pertained to a fourth sub-theme of “*reducing SMU*”, either through generally reducing screen time, or capping SMU between specific times of the day, e.g.:

*“Avoid using social media before bed.”*

## **Theme 2: Offline behaviour changes**

Goals also pertained to changes in relation to offline behaviour (n=39; 23.1%). Of these, many were centred around the sub-theme of “*social connection*”, relating to spending more time with their

family, friends and romantic partners in person (n=15). A few explicitly stated wanting to spend less time on their phones in order to be more present with their loved ones, e.g.:

*“Have 15 mins screen-free dedicated child time.”*

*“Have a date night with my partner once a week.”*

Eleven goals, clustered under the second sub-theme pertaining to the prioritisation of “health and wellbeing”, mostly through exercise and spending time with nature.

*“Taking time off social media and spending it outside or doing exercise one evening/afternoon a week.”*

Eight goals fell under the third sub-theme of increased engagement in “hobbies”, which were mostly creative in nature.

*“Create digital sketches.”*

Finally, four goals pertained to the sub-theme of “employment, education and training”.

*“Find a career that I like and feel good in.”*

### **Theme 3: Changes to both online and offline behaviours**

The last theme summarised goals which either did not specify whether they alluded to online or offline behaviour, or could fit into either of the first two themes (n=15, 8.9%). Notably, all of these responses related to SC with family or friends.

*“Talk to my family everyday.”*

### ***Sensitivity analyses***

***Value domains of high importance:*** Additional sensitivity analyses examined whether potential shifts in VLQ domains (Wilson et al., 2010) important to the individual were overshadowed by the absence of changes in less prioritised domains. Essentially, if certain domains measured by the VLQ were irrelevant, the lack of VCB changes would be unsurprising.

To test this notion, an index of VCB with respect to the individual’s most important valued domains was calculated. To do this, *consistency* ratings for each VLQ item/domain were averaged (*for each person*) for all items that were rated 8 or greater with respect to ‘importance’ (at T1) (see Table 5 for the means and standard deviations for the T1 importance scores). A threshold of 8 was selected on the basis that it represented the sum of the mean score across all ‘importance’ ratings (M=6.79) plus the SD (1.16). This was performed on *online* consistency ratings, and separately for the *offline* consistency ratings (see Table 6 for means and standard deviations).

Having derived this consistency index of VCB for each participant’s most important domains, a paired samples t-test was conducted to determine whether scores shifted between T1 (M=7.17, SD=1.86) and T3 (M=7.13, SD=1.71) for the experimental group. No significant shift was found ( $t(79)=-.214$ ,  $p=.831$ ). There was also no significant difference in scores of the *offline* version of this consistency index between T1 (M=7.95, SD=1.62) and T3 (M=7.64, SD=1.66) ( $t(79)=1.77$ ,  $p=.081$ ).

**Table 5***Means and standard deviations of T1 importance scores for each VLQ item (experimental group)*

VLQ item	Mean	SD
Family	8.56	1.60
Marriage/couples	7.86	2.50
Parenting	5.52	3.47
Friends/social life	8.44	1.91
Work	7.11	1.51
Education	7.20	1.72
Recreation	7.72	1.66
Spirituality	5.59	3.28
Citizenship	5.94	2.31
Physical self-care	6.50	2.00
Environmental issues	5.47	2.18
Art	5.64	2.53

**Table 6***Means and standard deviations of the experimental group's consistency values for their most important values, and the "friends/social life" value*

VLQ	T1	T3
	<i>M (SD)</i>	<i>M (SD)</i>
Online Consistency of most important values	7.17 (1.86)	7.13 (1.71)
Offline Consistency of most important values	7.95 (1.62)	7.64 (1.66)
Online Consistency of "friends/social life" item	7.80 (1.75)	7.70 (1.88)
Offline Consistency of "friends/social life" item	7.74 (2.38)	7.79 (1.92)

**Social domain:** Due to evidence suggesting that SM engagement is largely driven by the desire to meet SC needs (Yang et al., 2021), and supported by qualitative analyses of identified goals, paired t-tests were performed to assess whether consistency scores for the “friends/social life” item of the VLQ shifted between T1 and T3 in the experimental group (Table 6). There were no significant differences found in the experimental group's *online* consistency scores for the “friends/social life” value between T1 (M=7.80, SD=1.75) and T3 (M=7.70, SD=1.88) ( $t(81)=.570$ ,  $p=.570$ ). Similarly, no significant differences were observed in the *offline* consistency scores for this item between T1 (M=7.74, SD=2.38) and T3 (M=7.79, SD=1.92) ( $t(81)=-.205$ ,  $p=.838$ ).

These results indicate that the micro-intervention was not effective at improving online or offline VCB for participants’ most important values nor in improving their social life-related VCB.

## Discussion

Studies indicate that one’s motivations for and behaviour on SM can determine psychosocial outcomes (Clark et al., 2018; Yang et al., 2021). Coupled with the associations between VCB and greater MH (Hayes et al., 1999), and the effectiveness of micro-interventions in eliciting targeted behaviour change (Kamboj et al., 2017), the present study aimed primarily to test the immediate and sustained effects of a values-based micro-intervention, developed by the supervisor and two previous trainees. We hypothesised that through the ACT processes of values clarification and committed action to act in line with these values (Hayes et al., 1999), the experimental group would report greater PSMU at post-intervention (T2) (H1) and follow-up (T3) (H2) compared to the control group. It was also hypothesised that the experimental group would report significantly increased online VCB (H3), which would, in turn, lead to increased positive affect (H4), SC (H5) and general



wellbeing (H6). Lastly, we hypothesised that any observed improvements in the experimental group would be positively associated with PF levels (H7).

Contrary to the hypotheses, the experimental group did *not* reveal significant changes to their PSMU (H1, H2), online VCB (H3), SC (H5), or general wellbeing (H6), when compared to the control group. Whilst not in the hypothesised direction, a significant *decrease* in positive affect was observed across both groups (H4). Although not hypothesised *a priori*, a decrease in negative affect was seen in the *experimental* group, whereas no such change was observed in the control group. However, this finding was rendered non-significant after adjusting for multiple comparisons. Additionally, VCB, was assessed only in the *experimental* group at baseline, and showed no significant change at follow-up, indicating a lack of meaningful difference in VCB between these two timepoints (H3). Furthermore, there were no significant associations between PF and any changes in key outcome variables, which was not surprising given the lack of observed change from the intervention.

Research shows that behaving and living in accordance with one's values positively impacts on MH (Michelson et al., 2011), general wellbeing and social functioning (McCracken et al., 2015). However, our findings suggest that the intervention was not successful in enhancing online VCB and PSMU; thus, a lack of improvement was observed for positive affect, SC and general wellbeing. The possible explanations for these results are discussed below, followed by their implications and conclusions.

### **Secondary analyses**

To address the study's secondary aim of investigating possible reasons for a lack of behavioural effects from the intervention (H1-H3), a thematic analysis was run to detect themes in the experimental group's values-consistent goals for the 'committed action' task. Themes pertained largely to SC with loved ones, both regarding online *and* offline behaviour changes, which was supported by "family" and "friends/social life" being the most highly rated VLQ domains of

importance (Wilson et al., 2010). This is consistent with research indicating that young adults' motives for SMU is largely driven by the gratification of social needs (Cheung et al., 2011).

Sensitivity analyses explored the possibility that the absence of significant shifts in VCB across *all* VLQ domains due to the micro-intervention might have masked changes in VCB related to individuals' *most important* values. However, the intervention did not facilitate shifts in VCB for participants' most important values, nor for the 'social value' alone. This is consistent with the lack of difference in self-perceived PSMU between the two groups. It is worth noting that although participants were instructed to specify a SMART goal in relation to their SMU, many goals were non-specific (e.g. "less mindless scrolling"). A lack of specific plans to implement their goals and overcome potential barriers, alongside habitual behaviour patterns may have left an intention-behaviour gap, which inhibited the translation of participants' intentions to action (Ajzen, 1991). Future research may therefore wish to incorporate more support around SMART goal-setting to aid understanding and encourage participants to make plans to overcome potential barriers to facilitate the shift in VCB.

### **The influence of external factors and the nature of participants' goals**

The lack of improvement in PSMU and VCB and subsequent wellbeing effects may be accounted for by the influence of external factors. One possible explanation is that the gratifications sought by participants may not have been obtained during the SM exposure task. Consistent with the U&GT (Katz et al., 1973), individuals often use SM to gratify certain needs online, and when these are not obtained, participants may have a reduced intention to continue with SMU in a values-consistent way (Bae et al., 2018). This rings especially true for social needs sought by individuals when engaging with SM, the degree of gratification of which, according to the ICBF (Clark et al., 2018), may determine how SMU may impact beneficially or negatively on individuals' wellbeing. Therefore, it is possible that if a participant who, for example, had a goal of reconnecting with friends by messaging

them does not receive a response back, this social need may have not been gratified, leading to lack of improvements in PSMU, VCB, and psychosocial outcomes.

Related to this, messaging with others and commenting has been correlated with reduced stress, negative affect and more positive affect (Frison & Eggermont, 2016). Similarly, *receiving* positive feedback from "likes" and comments on SM boosts self-esteem, life satisfaction, and general wellbeing for young people (Burrow & Rainone, 2017; Yang & Brown, 2016). It is possible that in our study, participants tried to enact VCB by initiating contact with others, reflecting the SC nature represented by the majority of participants' values-consistent goals, which could explain the slight decrease in negative affect reported in the experimental group between pre- and post-intervention. However, for participants who engaged in active posting of content in either the experimental or control group, the five-minute SM exposure may have left insufficient time for "likes" to accumulate, and this lack of positive feedback may reflect the lack of change in psychosocial outcomes and a decrease in positive affect. This is supported by Greitemeyer (2016) who revealed that a lack of responses to posts may signal social neglect, leading to lower self-esteem, decreased sense of purpose, and increased loneliness.

Moreover, the nature of participants' values-consistent goals may have influenced our findings, either by contrasting directly with the SM exposure task or being incompatible with the five-minute time frame (e.g. "Post a new photo weekly on my creative Instagram account"). The thematic analysis revealed more goals pertaining to reducing use (in favour of engagement in *offline* behaviours) rather than more active posting (e.g. "Have 15 mins phone-free child time"). In these instances, participants would find it difficult to act in line with their values on SM, which would explain a lack of change in PSMU or VCB as the exposure task would not have facilitated VCB for these goals. However, since participants' behaviours on SM during the exposure task were not captured, future research might benefit from capturing data on the nature of participants' SMU

during the SM exposure, and any barriers participants encountered in relation to obtaining their goals.

### **Attributes of the intervention**

It is also possible that attributes of the intervention itself could explain the lack of significant findings found in this study. Specifically, the intervention may have been unsuccessful in eliciting the targeted ACT processes necessary for positive behaviour change. This could be due to issues related to the quality and dose of the intervention, or a combination of both. Additionally, there might have been other contributing factors, such as the absence of targeting other ACT processes, which might have contributed to insufficient values clarification and a lack of skills to elicit change.

Firstly, the intervention might not have been rich enough to elicit thorough values clarification or committed action necessary for an increase in VCB and subsequent psychosocial effects. For instance, a six-week RCT by Bojanowska et al. (2022) demonstrated that combining a values-based intervention with mindfulness led to significant improvements in positive affect, reductions in negative affect, and increased life satisfaction amongst adults. Participants in that study clarified their top four values, engaged in weekly online reflection, and received reading materials emphasising values and VCB. These findings suggest that repeated reinforcement of VCB and deeper reflection of values may be necessary for meaningful changes in SMU, which were not observed in our study. The use of the VLQ alone for the values-clarification exercise might have limited the intervention's effectiveness. Barney et al. (2019) argued that the VLQ, which encourages reflection on value domains rather than specific values, may not capture the full range and dynamic nature of values relevant to individuals. Additionally, effective values-based interventions commonly incorporate interactive activities such as reflective writing or multimedia content, fostering deep engagement with the material (Engle & Follette, 2018; Firestone et al., 2019). Whilst our

intervention included elements such as listing important values and values-consistent goals, it may not have fully engaged participants to reflect on and commit to action towards their values in a manner conducive to behaviour change.

The brevity of our intervention and the single-session format may also have contributed to its limited effectiveness. Despite evidence from a small number of studies indicating the effectiveness of single-session values-based interventions in emerging adults (e.g., Chase et al., 2013), the present study is the first to test such an intervention in the context of SM. The short intervention duration and the request for participants to set up to three SMU-related values-consistent goals may have been insufficient to elicit the 'committed action' process necessary for behaviour change. Effective interventions have typically involved more extended engagement and repeated reinforcement, as seen in the six-week study by Bojanowska et al. (2022).

Apart from the quality and duration of the intervention, another important factor could be the lack of integration of additional ACT processes. Acceptance, defusion, self-as-context, and present-moment awareness are key ACT processes that contribute to PF and mindfulness (Hayes et al., 2006). Mindfulness, defined as conscious attention regulation coupled with an open and accepting mindset towards the present moment (Bishop et al., 2004), was not targeted in our intervention. Integrating mindfulness components could help participants develop the PF necessary to persist with VCB, even in the face of discomfort. This is supported by a meta-analysis by Levin et al. (2012), which demonstrated that the combination of values and mindfulness components in ACT interventions yielded larger effects compared to the values component alone. Furthermore, mindfulness has been found to protect against negative emotions and antisocial actions triggered by feelings of isolation, such as receiving few "likes" on SM (Jones et al., 2022). Therefore, incorporating a mindfulness component in interventions targeting SMU might enhance their effectiveness.

The intervention results revealed a decrease in both positive and negative affect, with distinct patterns observed between the experimental and control groups. Both groups experienced a decrease in positive affect from pre- to post-intervention. This reduction in positive affect could be attributed to the general exposure to SM, as meta-analyses and systematic reviews have found an association between increased SMU and poorer mood (Abi-Jaoude et al., 2020; Keles et al., 2019). Moreover, the brevity of the five-minute SM exposure task may have led participants to engage in *passive* SMU such as *browsing* (negative) content, or *passively* viewing others' profiles, potentially leading to social comparisons (Verduyn et al., 2015). Engagement in passive SMU, which has often been linked with poorer wellbeing, may have thus reduced positive affect across both groups (Frison & Eggermont, 2017).

Whilst both groups experienced a decline in positive affect, the decrease in negative affect was only observed in the experimental group. This reduction in negative affect may be attributed to the meaningful engagement encouraged by the values-clarification exercise and committed action task, which prompted participants to reflect on their values and pursue value-consistent goals, such as connecting with loved ones—activities often associated with improved MH (Wright et al., 2013). Although this reduction in negative affect was rendered non-significant after adjusting for multiple comparisons, it may indicate a potential impact of the intervention if effects were strengthened and tested in a larger sample.

### **Limitations**

The present findings must be interpreted in light of notable limitations. Firstly, the generalisability of findings is restricted mainly to white, cis-gendered, female participants. However, this is reflective of a wider issue of over-sampling of participants from western, educated, industrialised and democratic (WEIRD) populations within psychological research (Henrich et al., 2010). Future research should aim

to increase the generalisability of findings through active recruitment amongst non-WEIRD populations, e.g. through stratified sampling.

Due to the ethical constraints and technical challenges associated with accessing server data pertaining to SMU (Zimmer, 2010), the study relied on self-reported measures. Whilst the use of reliable and well-validated measures enhanced internal validity, it is important to acknowledge that self-reported data are susceptible to biases like demand characteristics and recall bias, potentially decreasing the reliability of the findings. To contextualise the results, future research should consider asking participants to comment on their activity during the SM exposure task at post-intervention, e.g., the number of messages sent and received, time spent on SM during the task, barriers encountered. This could explain how participants' SMU impacted on their self-perceived PSMU and barriers to VCB.

Additionally, the PESMUQ was not administered at baseline to avoid orienting the control group to their values, but this omission resulted in the inability to capture participants' views on SMU prior to the intervention. Baseline scores could have influenced intervention effectiveness, as participants reporting high PSMU beforehand might not have expected changes post-intervention. Furthermore, whilst current research on the validity of the PESMUQ shows promise (Tibber et al., under review), it is a new measure and warrants further investigation to establish its reliability, particularly in English-speaking samples.

Moreover, although the study aimed to capture participants' responses at one-week follow-up, the final sample completed T1-T3 measures across a mean of 16.3 days ( $SD=20.3$ ). If the intervention only rendered short-term effects, it is possible these were missed due to the longer follow-up completion timeframe of participants with a skew towards non-significant findings. However, sensitivity analyses which only looked at participants who completed T1-T3 within 31 days was performed, which did not render a change in findings (see Appendix K).

To ensure the robustness of the findings, complete case analyses were primarily conducted, focusing on participants who completed the study at all timepoints (T1, T2, and T3). This approach was selected to maintain data integrity and provide a clearer assessment of the intervention's efficacy, reflecting how the intervention performs when participants fully engage with it (Nandwani et al., 2021). However, it is essential to recognise that complete case analyses have limitations; by excluding participants with missing data, this method may lead to biased results if dropout is systematic. An alternative method, last-observation-carried-forward (LOCF), was considered but deemed unsuitable, as it assumes that missing data points are equivalent to the last observed values. This assumption can introduce bias, particularly in an intervention designed to elicit change, potentially masking true effects. This issue with LOCF is further compounded by different outcome measures being administered at different timepoints, especially between T2 and T3.

Recognising the potential for bias due to participant attrition, sensitivity analyses were also conducted using all available data (Appendix L). These additional analyses yielded the same pattern of results and effect sizes to the complete case analyses, confirming the consistency of the findings. Furthermore, logistic regression analyses were employed to predict the likelihood of measure completion at T2 and T3 (PESMUQ) and T3 (VLQ). The results indicated that none of the baseline or demographic factors significantly predicted completion/dropout (appendix N), suggesting that attrition was likely random and not selectively related to the variables assessed.

Finally, the large number of questionnaires administered throughout the study may have contributed to participant fatigue, potentially affecting the high attrition rates across timepoints. Future research could consider optimising the number of self-reported measures and piloting questionnaires to specifically assess their length and participant burden, ensuring that the (number of) measures used do not contribute to fatigue and thereby improve retention.



## **Implications**

Despite the lack of change, the findings of this study hold significant implications for future research and intervention design aimed at promoting PMSU and improving psychosocial outcomes.

Firstly, the lack of significant improvements in online VCB, PSMU and psychosocial outcomes highlights the need for a deeper understanding of the mechanisms underlying effective interventions targeting SMU. Integrating mindfulness components into values-based interventions, as suggested by previous research (Bojanowska et al., 2022), may enhance their effectiveness in fostering sustained behaviour change and improving wellbeing outcomes. Future studies should explore the impact of repeated reinforcement of combining mindfulness practices with values-clarification and committed action techniques, particularly in the context of SMU.

Moreover, the findings emphasise the importance of addressing the specific goals and needs of individuals when designing interventions. Consistent with the literature (Clark et al., 2018), the thematic analysis revealed that participants' goals predominantly focused on SC, indicating the significance of addressing social needs in interventions targeting SMU. Future interventions may wish to help participants anticipate and overcome potential barriers to achieving their goals, thereby increasing PF to persist in VCB in the face of difficulty.

Furthermore, the brevity of the intervention and the lack of specificity in goal-setting may have contributed to the observed outcomes. Future interventions should consider extending the duration of interventions and providing participants with more specific guidance on SMART goal-setting to facilitate meaningful behaviour change. Incorporating interactive activities, such as reflective writing and multimedia content, can enhance participant engagement and promote deeper reflection on values and committed action (Firestone et al., 2019).

## **Conclusion**

In conclusion, whilst this study did not produce the hypothesised outcomes, it offers valuable insights for future research and intervention design. Integrating mindfulness practices, tailoring interventions to individuals' social needs, and enhancing participant engagement through interactive activities are key considerations for improving the effectiveness of interventions targeting SMU.

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## **Part Three: Critical Appraisal**

## **Critical appraisal**

This section critically examines my journey through the systematic review and empirical research phases of my doctoral thesis. I discuss the decision-making process involved in selecting my thesis topic and reflect on the different stages of the research process. Finally, I offer broader reflections on the outcomes of my thesis and their implications for future research and my own practice.

### **Background**

Before clinical training, I gained research experience through my university degrees and assistant psychologist roles. I completed an undergraduate degree in psychology at University College London (UCL), followed by a master's degree in health psychology and eventually my DClInPsy training at the same institution.

During my undergraduate studies, I was supervised by Dr. Katrina Scior on a project exploring the impact of changing labels denoting 'intellectual disability' on lay people's attitudes and causal beliefs. Through this, I gained experience in setting up and collecting data for a randomised controlled trial on Qualtrics. Despite the lack of significant results, I learned that non-significant findings can also hold value, leading to the publication of this work in the BPS bulletin.

For my MSc in Health Psychology, I conducted quantitative secondary analyses on the relationships between perceived stress, anxiety, sleep problems, and salivary cortisol amongst UK university students under varying academic stress levels. As an assistant psychologist, I conducted descriptive and thematic analyses on client feedback to evaluate a new psychoeducation group within a Home Treatment Team (HTT). I co-presented these findings at the HTAS Forum for Crisis Resolution & HTTs Conference at the Royal College of Psychiatrists. Additionally, I helped create a "recovery stories booklet" for Early Intervention in Psychosis (EIP) services, involving interviews with service users about their recovery journeys.

Clinically, my experience predominantly included working with carers of clients with first episode psychosis (FEP) in an EIP service, which was preceded by co-facilitating psychoeducational groups in an HTT for five months. Whilst I had more diverse research than clinical experience, I was aware that it had been a few years since I last wrote a research paper for my masters, or any academic pieces of work before the DClInPsy.

### **Selection of a project**

When selecting a thesis project, my primary goal was to find a topic that genuinely interested me, as I believed this would keep me motivated through the long three-year process. Before starting the DClInPsy, I was intrigued by the differing impacts of social media use (SMU) on psychosocial outcomes. Given the prevalence of social media (SM) in society and my fascination with the negative narrative often associated with SMU, I wanted to explore this area further in research. I often heard comments from my peers such as, "It's so bad, I spend way too much time on my phone/SM," or "I've decided to delete all my SM accounts because it was affecting me too much," and I wanted to understand what specifically about SMU caused such negative backlash. This contrasted with my own experience, where I generally found my own SMU to be quite positive and helped to enhance my feelings of social connection. I was keen to understand the factors influencing *why* SMU can affect psychosocial outcomes differently.

Another important consideration for me was choosing a quantitative project. Throughout my university studies, I felt most confident in the "quantitative and qualitative research methods" modules, consistently earning my highest grades, with much of the teaching focused on quantitative methods. Marc Tibber's project, which was advertised as the exploration of underlying pathways explaining the effects of a values-based micro-intervention on wellbeing, seemed like a great fit,

especially since I had also explored underlying relationships between variables for my master's thesis.

Additionally, I was drawn to developing my knowledge of Acceptance and Commitment Therapy (ACT) theories. At the time of project selection, I had just started a placement in a specialist weight management service, where I first encountered ACT. I particularly appreciated that ACT was individualised based on personal values. The idea of adapting one's SMU to align with the kind of life one wanted to live, promoting positive SMU through an evidence-based framework, was an exciting opportunity to be part of something potentially groundbreaking.

Furthermore, I was enthusiastic about the prospect of giving feedback to the trainees (Anna Taylor and Jenny Thomson) in the year above throughout the development of the intervention. I enjoy collaborative work and believed that this teamwork would be beneficial. I wanted to grow my research skills by being involved in developing the intervention, collecting and analysing data, and writing up the findings. Altogether, this project felt like a brilliant fit with my interests and goals.

### **Systematic review**

The systematic review process was the most challenging part of my research. As someone new to this, I had not anticipated how arduous it would be, even though I began searching for a research question in early summer of my second year.

The process of trying to find a research question was becoming evidently very difficult for me when I had initially thought I could run with one idea - specifically looking into the effectiveness of interventions targeting SMU as a way of improving mental health (MH)/wellbeing, specifically in young people/adults. However, a few weeks later I would find myself back at stage one of trying to find a research question as I came across similar systematic reviews (e.g. Kruzan et al., 2022), one of which was published after I had run my initial search (Plackett et al., 2023). This forced me to restart



the process multiple times. This constant backtracking delayed my progress significantly. I felt like I was making no progress despite feeling like I was constantly working on my systematic review. Balancing this with placement demands including the transition to a new client group and setting, and attending lectures made maintaining a work-life balance nearly impossible. These factors led to burnout, and I took one month off in my first term of the final year to recover. To distinguish my review from that of others, I ended up focusing specifically on interventions that intentionally encouraged *active* SMU to improve MH across *all age groups*.

Reflecting on this, I realised the difficulty of finding a research question partially stemmed from the 'jingle jangle problem' (Kross et al., 2021), where conceptual confusion and methodological issues arise from overlapping definitions of SM and interchangeable use of constructs like wellbeing, affect, and MH. After discussing this with my supervisor, I decided to narrow down the MH/wellbeing construct of my research question to focus solely on depression and anxiety outcomes. My supervisor also introduced me to Meier and Reinecke's (2021) conceptualisation of SMU levels, which helped in interpreting my findings concerning the features of SMU interventions in the included papers.

The next challenge was selecting search terms and appropriate Boolean operators to identify relevant papers for my specific research question. I needed to find interventions involving active SMU whilst capturing depression and anxiety outcomes. Given the broad and overlapping definitions of 'SM' and 'intervention,' I decided to use a combined 'SM' and 'intervention' concept to refine my search results. This resulted in 6215 papers (as opposed to over 10,000 papers if I had left the 'SM' and 'intervention' terms uncombined) for the initial screening, though still only 0.3% were relevant and included in the review.

Despite the difficulties, I learned a great deal about the steps involved in conducting a systematic review and I feel really proud of the work I accomplished.

## **Empirical paper**

### *Data collection*

I began the data collection process with Anna and Jenny, the trainees in the cohort above me, during the summer of my first year/their second year (July 2022). We advertised the study on various platforms and I felt optimistic when we initially generated significant interest, reaching 100 participants in a short space of time. However, the recruitment rate soon slowed, prompting us to think creatively to boost numbers. We hung posters around UCL, scheduled adverts on our own SM platforms, and encouraged family, friends and colleagues to repost the advert on their platforms.

As my study included the follow-up period (T3), I also had to chase up participants to remind them to complete T3 measures. This was stressful and time-consuming, as I tried to balance sending reminders with other demands. Nonetheless, I am glad to have sent additional follow-up reminders (via email and SM) as I feel that this helped improve T3 uptake, positively impacting our final sample size.

Recruiting jointly with Anna and Jenny at the start was beneficial, but the challenge arose when I had to continue recruiting alone to meet the full sample size target of 200 participants. At one point, I felt I had exhausted all options to boost the sample size but found a way by contacting my content creator friends with larger SM followings to repost my study advert. I also asked the administrative team at my church to include an advert in their weekly updates and re-posted flyers around campus.

Ultimately, I reached a full sample of 190 participants, which was a relief, and I am hugely grateful for the support of my friends, family and church community. However, in retrospect, it would have been useful to consider a broader set of recruitment strategies, such as sending the advert to other universities and specifically targeting minority groups to increase diversity in our sample.

### *Data cleaning*

Although I was very grateful for the instructions left to me by Anna and Jenny, I conducted the data cleaning process alone, which was long, arduous, and complicated. My dataset initially included 634 entries with multiple questionnaires per person, collected online via Qualtrics. I needed to organise and convert all questionnaire values to the correct scoring systems and remove participants who had not completed enough of the intervention or control to be included in the analyses.

I exported the data from Qualtrics into Excel, scored the questionnaire responses, and ensured all responses matched the correct participant identification numbers. This meticulous process required careful navigation of the data to ensure each dataset was correctly coded. I thoroughly documented my cleaning steps to allow for backtracking in case of errors. For my analyses, an additional challenge I faced was matching baseline and follow-up datasets using the pseudonyms I had assigned. Although this was time-consuming, it provided an opportunity to enhance my Excel skills.

Although coding and cleaning the data required more time than I had expected, it helped me become familiar with the measures and think more critically about my hypotheses and potential findings.

### *Primary analyses*

The outcomes of the primary data analyses would determine the secondary analyses of my study, i.e., whether I would conduct mediation analyses to explore underlying pathways or sensitivity analyses to explain null findings. Thus, much depended on these outcomes.

Referring to the Open Science Framework (OSF) and its pre-registered data analysis plan (<https://osf.io/en4wy>) helped manage my anxiety about performing multiple different analyses. This involved conducting t-tests, mixed ANOVAs, and Pearson correlations. I chose SPSS as my software of choice for the data analysis, even though I had not used it formally for research in six years since my master's degree. Initially, I worried that I might struggle to reacquaint myself with the software. However, I was pleasantly surprised by how quickly it all came back to me, aided by my previous statistics teaching. This rekindled my confidence in my analytical abilities and felt like a reassuring return to a familiar process.

One concern that I had was the alpha level due to the number of analyses performed across all included variables. After discussing this with my supervisor, we decided to set the alpha level to .01 to correct for multiple comparisons (five primary variables). Initially, I worried this would limit my ability to detect significant results, but this ultimately made little difference as my non-significant findings did not come close to statistical significance.

Data analysis was one of the most enjoyable aspects of my thesis. Although I found no statistically significant results (or any in the hypothesised direction), my supervisor reminded me that this was a finding in itself and could offer valuable insights into future intervention developments through subsequent secondary analyses. This experience taught me the importance of non-significant findings and how they contribute to the broader research landscape. I found this process humbling as it challenged me to view data not just as numbers, but as a narrative that tells a story about human behaviour and interactions.

### *Secondary analyses*

Due to the lack of significant effects from the intervention, I explored possible sensitivity analyses that might be appropriate to explain the lack of improvements observed. One idea was to explore the nature of participants' values-consistent goals in relation to their SMU through a thematic analysis. This process was intriguing as I was less familiar with qualitative methods compared to quantitative ones. Running the thematic analysis helped contextualise participants' values and revealed how much their goals aligned with existing research on the motivation to satisfy social connection needs. Initially, I felt out of my depth with qualitative analysis, but as I delved deeper, I found it intellectually stimulating and rewarding.

However, the thematic analysis process was also challenging at times. I was grateful to have my themes cross-checked by my supervisor, which highlighted new information I initially missed. For example, my initial themes did not distinguish between SM goals relating to changes in online versus offline behaviour, or reducing use versus reducing *mindless* use. Revisiting the data with these distinctions in mind resulted in more nuanced final themes. This mixed-methods approach enriched the data and strengthened my appreciation for qualitative analysis, which I plan to further develop in the future. I found myself gaining a new perspective on the value of mixed methods, seeing firsthand how qualitative insights can complement and deepen the understanding gained from quantitative data.

Additionally, we tested whether participants' values-consistent behaviour, according to the Valued Living Questionnaire (Wilson et al., 2010), shifted concerning their most important values.

Calculating the mean consistency scores across participants' most important value domains was a complex task. Initially, I considered averaging consistency scores across each participant's highest-rated items of importance. However, this approach lacked standardisation since some participants rated their highest items as '10' whilst others rated theirs as '7'. This highlighted the challenge of individual differences in interpreting self-report measures like Likert-scale rankings (Field, 2009).

Therefore, to standardise across participants, we derived a threshold based on the sum of the mean importance ratings and the standard deviation.

The process of conducting sensitivity analyses and thematic analysis has been a great learning opportunity. It not only deepened my understanding of qualitative methods but also reinforced the importance of mixed methods in enriching data interpretation and analysis.

### **Reflections on study findings**

The study outcomes revealed that the values-based micro-intervention did not generate immediate or sustained enhancements in positive SMU, values-consistent behaviour, affect, feelings of social connectedness, or general well-being. Reflecting on our study design and our approach to targeting specific ACT processes to facilitate this change offered valuable insights into the results. To my knowledge our study marks the first attempt to employ a brief ACT-informed strategy for SMU. Looking back, I would have been curious to observe the effects of a comprehensive ACT intervention (including mindfulness components), given the complex nature of SMU engagement. Additionally, incorporating an element of inquiry into the specific actions participants in the experimental group engaged in during the five-minute naturalistic SM exposure task, as well as identifying any barriers to values-consistent behaviour during this task, could have provided further contextualisation of the findings.

### **Clinical implications**

Conducting and writing up this research has had significant implications for my clinical practice, particularly regarding SMU. Before this research, I did not routinely inquire about my clients' SMU in clinical sessions. However, I have since realised the importance of addressing this aspect of their

lives. Reflecting with clients on their evaluations of SMU has revealed how impactful these discussions can be. For example, whilst working with CAMHS clients, I discovered that many adolescents spent substantial time on SM, which influenced their self-esteem and social interactions. Similarly, in my current placement working with the university student population, I have seen how students' SMU can affect their MH, either by providing a sense of community or by contributing to feelings of isolation and anxiety.

Given the significant amount of time spent on SM by adolescents and young adults (Auxier & Anderson, 2021), it is useful for healthcare professionals to explore the motivations and patterns of SMU through a framework such as the transdiagnostic cognitive-behavioural conceptualisation of the positive and negative roles of SMU on MH (Tibber & Silver, 2022). This model integrates core processes such as the individual's motivation for SMU (e.g., for social connection), level and types of purposeful engagement with SM, and the technical features of the platform, to explain how SM use may impact MH. This insight can help tailor the development of SM interventions to promote wellbeing.

These insights have shaped my clinical practice. I now routinely explore how my clients' SM habits affect their mood and behaviour. I encourage mindful reflection of their SMU by asking what they primarily use SM for, assessing their motives, and evaluating the degree of interactivity with others. I also examine whether the pages they engage with on SM provide content that they find helpful and discuss how to use SM in line with their values. By encouraging clients to reflect on their motives for using SM, I can help them make more intentional choices that align with their values. For example, students can identify and reduce passive scrolling and instead engage in more meaningful online interactions that contribute to their sense of community and support their personal goals.

Moreover, the study's results have underscored the importance of mindfulness processes in ACT. When working within the ACT model, whether concerning online or offline life, I will try to be thorough in addressing all six core processes: acceptance, defusion, self as context, present moment

awareness, values, and committed action. I now appreciate the value of each component in creating psychological flexibility.

## **Conclusions**

Completing this thesis has been an enriching experience, profoundly enhancing my research skills, particularly in conducting a systematic review and delving into thematic analysis. Although the findings of the empirical paper were not as hypothesised, the process has provided invaluable insights into the complexities of SM interventions. I am determined to contribute to the ongoing discourse on SM's impact on MH, emphasising both its positive and negative aspects. Integrating these newfound skills into my clinical practice as a future Clinical Psychologist, I aspire to develop evidence-based interventions that effectively support mental wellbeing. This experience has solidified my commitment to bridging the gap between research and practice, reinforcing my dedication to lifelong learning and professional development.



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## Appendices

## Appendix A: Full List of Search Terms Used

- 1 (social media adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)).ab,id,ti. 1666
- 2 (social network\* adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)).ab,id,ti. 3843
- 3 (blog\* adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)).ab,id,ti. 482
- 4 (vlog\* adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)).ab,id,ti. 14
- 5 ((Facebook or Instagram or twitter or youtube or snapchat or tumblr or pinterest or buzzfeed or bebo or myspace or tiktok or whatsapp or wechat or reddit or linkedin or quora or viber or weibo) adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)).ab,id,ti. 1627
- 6 1 or 2 or 3 or 4 or 5 7278
- 7 (((social media adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)) or (social network\* adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)) or (blog\* adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)) or (vlog\* adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)) or ((Facebook or Instagram or twitter or youtube or snapchat or tumblr or pinterest or buzzfeed or bebo or myspace or tiktok or whatsapp or wechat or reddit or linkedin or quora or viber or weibo) adj4 (intervention\* or microintervention\* or micro-intervention\* or program\* or treatment\* or support\* or peer-support\* or training\* or therap\* or psychotherap\* or group\* or counsel\* or forum\* or coaching)))) not gaming\*).ab,id,ti. 7251
- 8 mental health.ab,id,ti. 243118
- 9 "depress\*".ab,id,ti. 361201
- 10 "anxiet\*".ab,id,ti. 241403
- 11 "anxious\*".ab,id,ti. 25264
- 12 mood.ab,id,ti. 83641
- 13 "emotion\*".ab,id,ti. 384904
- 14 wellbeing.ab,id,ti. 22257
- 15 agoraphobia.ab,id,ti. 4854
- 16 panic disorder.ab,id,ti. 11118
- 17 (OCD or obsessive-compulsive disorder).ab,id,ti. 18789
- 18 phobia.ab,id,ti. 11085
- 19 hypochondriasis.ab,id,ti. 1909
- 20 (PTSD or post-traumatic stress).ab,id,ti. 47568
- 21 affective disorders/ 16052
- 22 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 1061961
- 23 7 and 22 2092

24 limit 23 to ("0120 non-peer-reviewed journal" or "0200 book" or "0240 authored book" or "0280 edited book" or "0300 encyclopedia" or "0400 dissertation abstract") 511

25 23 not 24 1581

26 limit 25 to yr="1997 -Current" 1441

27 limit 26 to ("0700 interview" or "0750 focus group" or "0800 literature review" or "0830 systematic review" or 1000 mathematical model or 1200 meta analysis or 1300 metasyntesis) 418

28 26 not 27 1023

29 ((cross-section\* or cross section\*) adj study).ab,id,ti. 36385

30 28 not 29 989

## Appendix B: The MQS Coding Manual for Quality Assessment (Chácon-Moscoso et al., 2023)

### Methodological Quality Scale (MQS)

#### External Validity

1. Inclusion and exclusion criteria for the units provided: explicit reasons provided as to why certain people were able to participate in the study and others were not:
  0. No: no explicit selection criteria for units AND with exceptions in their application; information unavailable.
  - 0.5. Intermediate: explicit selection criteria for units OR applied to all potential participants.
  1. Yes (replicable): explicit selection criteria for units AND applied to all potential participants.
2. Attrition: loss of units. In randomized experiments, this refers to loss that occurred after the random assignment, i.e., the number of participants from the initial sample that did not conclude the study (e.g., N pre minus N post).
  0. Unspecified: information is not available and cannot be calculated AND reasons for loss of units are not specified.
  - 0.5. Intermediate: number of units lost is specified or can be calculated OR reasons for loss of units are specified.
  1. Specified: no units are lost, or number of units lost is specified or can be calculated AND reasons for loss of units are specified.
3. Attrition between groups: this item evaluated the differences in attrition between two groups.
  0. Unspecified: information is not available and cannot be calculated AND reasons for attrition between groups are not specified.
  - 0.5. Intermediate: number of lost units is specified or can be calculated OR reasons for attrition between groups are specified.
  1. Specified: no units were lost, or number of lost units is specified or can be calculated AND reason/s for the attrition between groups is/are specified.
  9. Not applicable: no cross-group comparison.
4. Statistical methods for imputing missing data: to estimate what the study would have yielded had there been no attrition:
  0. High risk: it is not clear if there was attrition, or there was attrition and calculations to estimate effects were carried out without imputing missing data.
  - 0.5. Medium risk: values for the missing data points were imputed so they could be included in the analyses. The method used was specified, i.e., sample mean substitution, last value forward method for longitudinal data sets, hot deck imputation, single imputation (e.g., imputation, regression imputation), or multiple

imputation (e.g., likelihood ratio test after multiple imputation). The reasons for choosing the specific method were not specified.

1. Low risk: there was no attrition or values for the missing data points were imputed so they could be included in the analyses; and the specific method used AND the reasons for choosing the specific method were specified.

#### **External validity score:**

Add the scores obtained in items 1 – 4 and divide by the number of items. If item 3 is not applicable, do not add a score for that item and divide the summation of items 1, 2 and 4 by 3.

\*\*\*\*\*

#### Internal validity

5. Methodology or design: something an experimenter could manipulate or control in an experiment to help address a threat to validity:
  0. Pre-experimental/others (questionnaires/observational/naturalistic): a study with only one group and a maximum of two measurement occasions for the same dependent variable (e.g., pre-post design); or when there are two groups and only one measure (e.g., control-experimental design).
  - 0.5. Quasi-experimental (two groups without randomized assignment) non-equivalent control groups with pre-test and post-test; or one group with three or more measures of the same dependent variable (even without pretest): an experiment (exploration of the effects of manipulating a variable) in which units are not randomly assigned to conditions.
  1. Experimental; randomized: an experiment (exploration of the effects of manipulating a variable in which units are randomly assigned to conditions).
6. Follow-up period: the amount of time between the first post-intervention measurements and any additional measurements. When the study presented more than one follow-up period, the longest was considered.
  0. No follow-up or less than two months.
  - 0.5. Between two and six months (both included).
  1. More than six months.
7. Measurement occasions for each dependent variable: this item specified when the measurements were taken.
  0. Post-intervention only: all measurements were taken after the intervention.

0.5. Pre- and post-intervention: some measurements were taken before and immediately after the intervention.

1. Pre-, post-intervention and follow-up period: some measurements were taken before, immediately after the intervention, and again at a later date.

**8. Control techniques:**

0. None: no control technique is specified or described.

0.5. Masking OR other/s: masking, also known as double-blinding, refers to a procedure that prevented participants and/or experimenters from knowing the hypotheses; OR any other control technique was used (e.g., matching, stratifying, counterbalancing, constant, participant as own experimental control -longitudinal-).

1. Masking AND other: masking AND at least one other control technique.

**Internal validity score:**

Add the scores obtained in items 5 – 8 and divide by the number of items (4).

\*\*\*\*\*

Construct validity

**9. Standardization of the dependent variables: level of normalization of the tool to measure the variable that varied in response to the independent variable (also called effect or outcome).**

0. Low standardization (self-reports and post hoc records): all measurements were taken using ad hoc tools, developed in a specific situation, and without any study of their psychometric properties.

0.5. Medium standardization: at least one measurement was taken using structured tools with ONE study of their psychometric properties (reliability or one form of validity evidence).

1. High standardization: at least one measurement was taken using structured tools. At least TWO studies of their psychometric properties (reliability, validity, construction of scaling) were carried out.

**10. Construct definition of outcome: explanation of the concept, model, or schematic idea measured as a dependent variable:**

0. No definition: no concept treated as a dependent variable was measured in a conceptual or empirical way.

0.5 Vague definition: at least one concept treated as a dependent variable was defined in a conceptual and/or empirical way.



1. Replicable by reader in own setting: all concepts treated as dependent variables were defined in a conceptual and empirical way.

**Construct validity score:**

Add the scores obtained in items 9 and 10 and divide by the number of items (2).

\*\*\*\*\*

INTERPRETATION for each type of validity:

Score	Interpretation
< 0.5	Low
[0.5 – 0.75]	Medium
> 0.75	High

**Supplementary Table 1**

Mean external, internal and construct validity ratings per study according to the MQS scoring manual (Chácon-Moscoso et al., 2023), sorted by intervention type (Low: <0.50, Medium: 0.50-0.75, High: >0.75)

Study	External validity	Internal validity	Construct validity
<b>Interventions aimed for mental health samples</b>			
Boyd et al. (2019)	0.50	0.63	1.0
McEnery et al. (2019)	0.67	0.25	1.0
Rice et al. (2020)	0.83	0.25	1.0
Bailey et al. (2020)	0.67	0.25	1.0
Seekis et al. (2020)	0.75	0.75	1.0
Karim et al. (2021)	0.67	0.25	1.0
Amon et al. (2022)	0.67	0.38	1.0
Radovic et al. (2022)	0.88	0.75	1.0
Guevara et al. (2023)	0.63	0.63	1.0
Obichili et al. (2023)	0.59	0.50	1.0
Otu et al. (2023)	0.25	0.75	1.0
<b>Interventions aimed for physical health samples</b>			
Hightow-Weidman et al. (2015)	1.00	0.25	1.0
Owen et al. (2017)	0.50	0.63	1.0
Li et al. (2021)	0.75	0.88	1.0

Study	External validity	Internal validity	Construct validity
Pester et al. (2022)	0.75	0.88	1.0
Zamanifard et al. (2022)	1.00	0.50	1.0
<b>Interventions aimed for non-health-specific samples</b>			
Asbury et al. (2018)	0.00	0.50	1.0
Watkins et al. (2020)	0.33	0.38	1.0
Yu et al. (2020)	0.13	0.63	1.0
Yu (2020)	0.63	0.63	1.0
Janicke-Bowles et al. (2022)	0.75	0.25	1.0
<b>Interventions aimed for carers</b>			
Han et al. (2022)	0.50	0.25	1.0
Hong et al. (2023)	0.50	0.25	1.0

## Appendix C: Ethics Approval

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UCL RESEARCH ETHICS COMMITTEE  
OFFICE FOR THE VICE PROVOST RESEARCH



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24th May 2022

Dr Marc Tibber

UCL Research Department of Clinical, Educational and Health Psychology

Cc: Anna Taylor and Jennifer Thomson

Dear Dr Tibber

Notification of Ethics Approval with Provisos Project ID/Title: 22087/001: Development and evaluation of short-to-medium-term effects of a values-based micro intervention for social media use in emerging adults

Further to your satisfactory responses to the Committee's comments, I am pleased to confirm in my capacity as Chair of the UCL Research Ethics Committee (REC) that your study has been ethically approved by the UCL REC until 1st September 2023.

Ethical approval is subject to the following conditions:

Notification of Amendments to the Research

You must seek Chair's approval for proposed amendments (to include extensions to the duration of the project) to the research for which this approval has been given. Each research project is reviewed separately and if there are significant changes to the research protocol you should seek confirmation of continued ethical approval by completing an 'Amendment Approval Request Form' <https://www.ucl.ac.uk/research-ethics/responsibilities-after-approval>

Adverse Event Reporting – Serious and Non-Serious

It is your responsibility to report to the Committee any unanticipated problems or adverse events involving risks to participants or others. The Ethics Committee should be notified of all serious adverse events via the Ethics Committee Administrator ([ethics@ucl.ac.uk](mailto:ethics@ucl.ac.uk)) immediately the incident occurs. Where the adverse incident is unexpected and serious, the Joint Chairs will decide whether

the study should be terminated pending the opinion of an independent expert. For non-serious adverse events the Joint Chairs of the Ethics Committee should again be notified via the Ethics Committee Administrator within ten days of the incident occurring and provide a full written report that should include any amendments to the participant information sheet and study protocol.

The Joint Chairs will confirm that the incident is non-serious and report to the Committee at the next meeting. The final view of the Committee will be communicated to you.

#### Final Report

At the end of the data collection element of your research we ask that you submit a very brief report (1-2 paragraphs will suffice) which includes in particular issues relating to the ethical implications of the research i.e. issues obtaining consent, participants withdrawing from the research, confidentiality, protection of participants from physical and mental harm etc.

In addition, please:

- ensure that you follow all relevant guidance as laid out in UCL's Code of Conduct for Research;
- note that you are required to adhere to all research data/records management and storage procedures agreed as part of your application. This will be expected even after completion of the study.

With best wishes for the research.

Yours sincerely



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Professor Lynn Ang  
Joint Chair, UCL Research Ethics Committee

## **Appendix D: Joint Thesis Declaration**

This thesis was a joint project with Anna Taylor and Jennifer Thomson. Anna investigated the immediate (T2) effects of the values-based micro-intervention (Taylor, 2023), whilst Jennifer looked at the sustained effects (T3) (Thomson, 2023), both with smaller sample sizes than the present study.

Systematic review: The systematic review was conducted entirely independently by the author, with cross-coding by Charlotte Jones (CJ).

Empirical paper: The selection of relevant questionnaires, ethics application and intervention design were undertaken by Anna and Jennifer. The recruitment process was jointly undertaken by the author, Anna and Jennifer from July 2022 to November 2022. The author was solely responsible for recruitment from December 2022 to February 2024 to conduct analyses with a full sample size for the present thesis. The author undertook all sensitivity analyses to explore potential reasons for null findings. Data cleaning for the present study was undertaken by the author alone, as were data analyses and the write up of the empirical paper. Data from the thematic analysis was cross-checked by the research supervisor Marc Tibber (MT).

## Appendix E: Advert for Study Recruitment



### About the study

Research suggests there are both positive and negatives aspects to using social media in terms of its impact on well-being. We are interested in whether using social media in a way that is more closely aligned with your values might be an effective way of increasing its benefits and reducing its risks.

#### What it involves?

- Brief online questionnaires and completing a short exercise before looking at social media for 5 minutes
- 1 week later completing the same questionnaires

#### Benefits?

- Being entered into a prize draw
- Contributing to research on social media

#### Are you eligible?

- 18-29 years old
- English speaking
- User of at least 1 social media platform

Scan here to take part or click the link below



Research Team Contact Details:

## Appendix F: Participant Information Sheet

RESEARCH DEPARTMENT OF CLINICAL, EDUCATIONAL AND HEALTH PSYCHOLOGY

Research Team Contact Details:

Dr Marc Tibber – Clinical Psychologist

Anna Taylor - Trainee Clinical Psychologist

Jennifer Thomson - Trainee Clinical Psychologist

Kloe Lee - Trainee Clinical Psychologist

Ethical approval for this study has been obtained through the UCL REC committee ID number: 22087/001

The impact of using social media in line with your values



What is this study about?

We are inviting you to take part in a research study that is investigating whether completing a brief online intervention can support emerging adults (18–29-year-olds) to use social media in line with their values (i.e. in line with what is important to them in life) and whether this has an impact on their wellbeing. We have provided a summary of the study below and what it will involve you doing, so that you can decide whether you would like to take part.

Why are we doing this study?

Research suggests there are both positive and negatives aspects to using social media in terms of its impact on wellbeing. We are interested in whether using social media in a way that is more closely aligned with your values might be an effective way of increasing its benefits and reducing its risks.



We hope that the information we find from this study can help us design resources to people use social media in a healthy and positive way.

Why have I been invited to participate?

By clicking on the link you have expressed an interest in potentially taking part in the study.

You can take part in the study if you:

- are 18-29 years old
- are a fluent English speaker
- use at least one social media account once per day (on average).

Do I have to take part?

No. Taking part is voluntary. It is your choice whether or not you would like to participate. If you do decide to participate, you will be asked to complete a consent form at the end of this information sheet. If you do agree to take part, you are still free to stop at any point without giving a reason. You also have the right to withdraw your data up to two weeks after you have completed the study.

What will happen if I choose to take part?

You will be randomly allocated into one of two groups. One group will take part in an online 'values-based' intervention. This intervention will consist of identifying and reflecting on what is important to you in life, and then briefly using a social media platform of your choice for 5 minutes. The other group will complete a control task involving questions about your favourite colours before briefly using a social media platform of your choice for 5 minutes. Before and after the intervention you will be asked to complete a survey. [Note: everything will be presented online using Qualtrics, a web-based survey tool which is compliant with General Data Protection Regulation (GDPR)]. We anticipate that the questionnaires will take you 20 minutes to complete.

The survey will ask you questions about:

- Demographic information including: Your name, your age, your sex, your gender identity, your ethnicity. You do not have to provide information about your sex, gender identity and/or ethnicity if you do not want to.
- Social media use, such as time spent on it per day.
- Your emotional wellbeing.
- Your social relationships.
- Your values (what is important to you in life).
- How you respond to challenges in the pursuit of what is important to you.
- How mindful you typically are about your thoughts and feelings during the day.

We will also ask you for your email address so that we ask you to complete another brief survey one week later.

You can opt out of the study at any point with no consequences. If you wish to withdraw your participation from the study and have your data removed after taking part you can do so by contacting Dr Marc Tibber (email address below) up to two weeks after you took part.

Are there any risks to taking part?

There are no major risks to you taking part in this study. The study has undergone a rigorous ethical review to consider possible risk to anyone who participates and gained ethical approval the UCL Research Ethics Committee. If you have any concerns or questions before deciding whether you'd like to take part please contact Dr Marc Tibber (email address below).

Please note that some questions included in the study concern some slightly sensitive topics, such as the following:

- Please select the answer that shows how much you agree or disagree with the following statement: Even around people I know, I don't feel that I really belong.
- Please rate how much you agree with the following statement: Even when something is important to me, I'll rarely do it if there is a chance it will upset me.
- Please select the box that best describes your experience of each over the last 2 weeks: I've been feeling optimistic about the future.

If you are affected by any of the questions and are concerned about your mental health, please contact your GP.

If you are in crisis or experiencing a medical emergency, please ring 999 or attend your local A&E department.

Are there any benefits to taking part?

If you participate to the end of the study (including one week follow-up) you will be given the option of entering a prize draw for one of ten £25 Amazon vouchers. Beyond this, you will be contributing to our understanding of whether our intervention is effective in supporting emerging adults to use social media in a way that maximises the benefits and minimises the risks. We hope that the findings from the study will be used to inform further research and develop resources and interventions to help emerging adults use social media in ways that support their wellbeing.

Who is organising and funding the research?

The study is being undertaken at the department of Clinical, Educational and Health Psychology at University College London (UCL). The department provide us with a small amount of funding to finance this research. The research will contribute to the doctoral theses of three training Clinical Psychologists at UCL.

Has this research been approved?

Yes. The research has been approved by the UCL Research Ethics Committee.

What will happen to my information?

All the information you provide will be stored securely and password protected on the UCL network and will be treated as confidential within the research team. This means only the research team will have access to it. Once we have collected your data it will be pseudo anonymized. This means that only the research team will be able to link your data to your name and age.

Once data analysis is complete, your data will be completely anonymised, so that no one will be able to identify you. The (anonymised) data will then be retained indefinitely for research purposes. These data may be shared with other researchers in order to help answer future research questions. However, you will not be identifiable from these data. Any information that is no longer required for the research will be destroyed.

As noted, if you decide you want to withdraw from the study you can contact Marc Tibber (email address below) up to two weeks after taking part and we will remove your data.

What will happen to the findings of the study?

The findings of the study will be written up and presented as part of three training Clinical Psychologists' doctoral theses. We also hope to publish the findings in peer-reviewed journals and/or as conference abstracts. In any of these documents it will not be possible to identify you in the write-up.

What if there is a problem during the study?

If you wish to complain or have any concerns about any aspect of the way you have been approached or treated by members of staff during your participation in the study, UCL complaints mechanisms are available to you. Please email Dr Marc Tibber (email below) if you would like more information about this.

Thank you for taking the time to read this information and considering taking part in the study!

Local Data Protection Privacy Notice: The controller for this project will be University College London (UCL). The UCL Data Protection Officer provides oversight of UCL activities involving the processing of personal data, and can be contacted at [data-protection@ucl.ac.uk](mailto:data-protection@ucl.ac.uk). This 'local' privacy notice sets out the information that applies to this particular study. Further information on how UCL uses participant information can be found in our 'general' privacy notice: For participants in health and care research studies, [click here](#). The information that is required to be provided to participants under data protection legislation (GDPR and DPA 2018) is provided across both the 'local' and 'general' privacy notices. The lawful basis that will be used to process your personal data are: 'Public task' for personal data and 'Research purposes' for special category data. UCL will keep identifiable information about you for three months after the study has finished. To safeguard your rights, we will use the minimum personally-identifiable information possible. If you are concerned about how your personal data is being processed, or if you would like to contact us about your rights, please contact UCL in the first instance at [data-protection@ucl.ac.uk](mailto:data-protection@ucl.ac.uk)

Research Contact: Dr Marc Tibber (Principal Investigator for the study).

Address: Research Department of Clinical, Educational and Health Psychology, University College London, Gower Street, London, WC1E 6BT

Name and Contact Details of the UCL Data Protection Officer: Alexandra Potts  
(dataprotection@ucl.ac.uk)

Data Protection ID number: Z6364106/2022/02/51 social research

*Please note: While UCL systems are secure and updated regularly, UCL cannot ensure the security of external email systems, by using email communication you are accepting of these potential risks (e.g. the potential for your emails to be hacked by external parties). If you would like more information on this please ask and more details can be provided before you send on any confidential data*

## Appendix G: Participant Consent Form

RESEARCH DEPARTMENT OF CLINICAL, EDUCATIONAL  
AND HEALTH PSYCHOLOGY



### CONSENT FORM FOR VALUES-BASED SOCIAL MEDIA INTERVENTION STUDY

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: Evaluation of a Values-Based intervention for social media use in emerging adults  
 Department: Research Department of Clinical, Educational and Health Psychology  
 Name and Contact Details of the Researcher(s): Anna Taylor and Jennifer Thomson  
 Name and Contact Details of the Principal Researcher: Dr Marc Tibber  
 Name and Contact Details of the UCL Data Protection Officer: Alexandra Potts (data-protection@ucl.ac.uk) This study has been approved by the UCL Research Ethics Committee:  
 Project ID number: 22087/001

Thank you for considering taking part in this research. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You can download this consent form by clicking below.

I confirm that I understand that by ticking/initialling each box below I am consenting to this element of the study. I understand that it will be assumed that unticked/initialled boxes means that I DO NOT consent to that part of the study. I understand that by not giving consent for any one element that I may be deemed ineligible for the study.

		Tick Box
1.	*I confirm that I have read and understood the Information Sheet for the above study. I have had an opportunity to consider the information and what will be expected of me. I have also had the opportunity to ask questions which have been answered to my satisfaction	
2.	*I understand that I will be able to withdraw my data up to two weeks after I complete the study.	
3.	*I consent to participate in the study. I understand that my personal information ( <i>name, age, sex, gender identity, ethnicity and social media use</i> ) will be used for the purposes explained to me. I understand that according to data protection legislation, 'public task' will be the lawful basis for processing.	
4.	<p><b>Use of the information for this project only</b></p> <p>*I understand that all personal information will remain confidential and that all efforts will be made to ensure I cannot be identified.</p> <p>I understand that my data gathered in this study will be stored anonymously and securely. It will not be possible to identify me in any publications.</p>	
5.	*I understand that my information may be subject to review by responsible individuals from the University for monitoring and audit purposes.	

6.	*I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason without my legal rights being affected. I understand that if I decide to withdraw, any personal data I have provided up to that point will be deleted	
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**Doctoral Programme in Clinical Psychology**  
**University College London Gower Street London WC1E 6BT**  
**General Enquiries Tel: +44 (0)20 7679 1897**  
**<http://www.ucl.ac.uk/clinical-psychology>**

	unless I agree otherwise.	
7.	I understand the potential risks of participating and know where to seek support should I become distressed during the course of the research, as outlined in the information sheet.	
8.	I understand the direct/indirect benefits of participating.	
9.	I understand that the data will not be made available to any commercial organisations but is solely the responsibility of the researcher(s) undertaking this study.	
10.	I understand that I will be eligible for entry into a prize draw for my participation once I have completed the one-week follow-up study	
11.	I understand that I will be compensated for the portion of time spent in the study (if applicable) or fully compensated if I choose to withdraw.	
12.	I agree that my anonymised research data may be used by others for future research. [No one will be able to identify you when this data is shared.]	
13.	I understand that the information I have submitted will be published as a report and I wish to receive a copy of it.	
14.	I consent to my data being stored anonymously, using password-protected software and will be used for training, quality control, audit and specific research purposes.	
15.	I hereby confirm that I understand the inclusion criteria as detailed in the Information Sheet.	
16.	I am aware of who I should contact if I wish to lodge a complaint.	
17.	I voluntarily agree to take part in this study.	
18.	I consent to my anonymised data being stored securely on the UCL network indefinitely.  I understand that other authenticated researchers will have access to my anonymised data.	
19.	I consent to being contacted by email for the follow-up survey approximately one week after I complete this part of the study and consent for my email address to be stored for this purpose.	

\_\_\_\_\_  
Name of participant

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

## Appendix H: Experimental Intervention

Welcome to this experiment on social media use. It should take about 15-20 minutes. Please read the information below. You will then be asked to complete some questionnaires, and then set some goals for how you would like to use social media in the future. Finally, you will be asked to use a social media platform of your choice for 5 minutes, and then complete some more questionnaires.

What are values?

Values are what we find meaningful in life. They are not things we want to get or achieve, but instead are the ways we want to behave. When we act in line with our values, we act like the sort of person we want to be. Our values are a compass that can guide us through life and can help us map out the actions that we want to take.

We can have lots of values, and there are hundreds of possible values to choose from. There are no 'wrong' or 'right' values, simply those that feel most true to us. For example, a person who values learning might prioritise studying over seeing their friends, whereas a person who values closeness to others might prioritise spending quality time with the people they love. Other examples of values include: authenticity, honesty, loyalty, independence, persistence, adventurousness.

Think of a time when you were doing something that felt full of meaning and purpose.

Perhaps you felt particularly alive in your family life, with friends, at work, or in doing a hobby. You might have noticed a feeling of excitement, engagement and enjoyment. The activity may have been challenging, but felt worthwhile, nonetheless. For example: going to the gym because you value self-care, or dedicating time to practising an instrument because you value creativity. This is what values are: ways of behaving that feel meaningful, whether or not they bring short-term pleasure.

Why are values important?

Values are important because they help us stick to our chosen direction in life. The more we are aware of our values, the more we are able to make decisions and behave in ways that are in line with our long-term interests rather than doing things that offer immediate gratification but don't bring us meaning. For example, it might feel gratifying in the moment to cancel our plans with friends if we are feeling anxious or unhappy. But if we strongly value social connectedness, we would realise that isolating ourselves will not bring meaning to our lives in the long term. There is evidence that people who live life in line with their values experience greater well-being, life satisfaction, and self-fulfilment, i.e. they feel they are really living up to their potential.

Values and social media use

So far, we have spoken about how knowing your values can help you act or behave in line with what is important to you in life, in general. However, we believe that acting in line with your values may be

just as important in your online life as it is for your offline life. We believe that being aware of your values when you are using social media may help you to access more of the benefits of social media, whilst avoiding more of its costs.

For example, if you value connection, social media might help you to connect with friends and family and feel closer to them as a result. If you value creativity, social media might provide you with an opportunity to share your artwork with others and express a part of yourself that is harder to express offline. Relatedly, we believe that holding your values in mind when using social media will make you less likely to drift into more unhelpful online behaviours, e.g. scrolling endlessly or comparing yourself unfavourably to others.

What are my values?

Now that we have explained what values are, and why they are so important (for your online and offline life), we would like to ask you to start thinking about your own values.

To start you doing this, we have listed a number of areas of life that often contain values of importance for people. For example, in the area of friends/social life, some people value supporting and caring for others. In the area of education/training, some people value curiosity and ongoing learning.

Please rate the importance of each area to you (by selecting a number) on a scale of 1-10. 1 means that this area is not at all important. 10 means that this area is extremely important.



	(Not at all)	2	3	4	5	6	7	8	9	10 (Extremely)	⊖ N/A
Family (other than marriage or parenting)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marriage/couples/intimate relations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parenting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends/social life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education/training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recreation/fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spirituality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Citizenship/Community Life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical self care (diet, exercise, sleep)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Art, creative expression, and aesthetics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Holding in mind some of the areas of life that you have rated as being important to you, we would now like you to specify three values that are particularly important to you. To help you, here are some more example values: authenticity, creativity, caring, connectedness, intimacy, honesty, loyalty, adventurousness, courage, assertiveness, independence, curiosity, fairness, justice.

Now we would like you to rate how well your behaviours lined up with your values in the past week. We'd like you to do this separately for your online behaviours, and your offline behaviours. Please note, we are not asking about how consistent you would like your behaviours to have been, or how others would judge you, but how consistently you think they have actually been. Whilst you should consider the values you listed above, you may also consider your values more broadly, i.e. additional values that you have not specified.

First, thinking about your *online life* over the past week (e.g. the way you have used social media platforms such as Facebook, Instagram, Twitter or WhatsApp) please rate from 1-10 how consistent your actions in your *online life* have been with your values in each of the areas listed. Note: if you use more than one social media platform, please respond in terms of how consistent your actions have been across them, rather than focusing on any single platform.

1 means that your online behaviours have been completely inconsistent with your values in this area.  
 10 means that your *online* behaviours have been completely consistent with your values.

	1	2	3	4	5	6	7	8	9	10	☺ N/A
Family (other than marriage or parenting)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marriage/couples/intimate relations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parenting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends/social life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education/training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recreation/fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spirituality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Citizenship/Community Life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical self care (diet, exercise, sleep)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental Issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Art, creative expression, and aesthetics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Now, thinking about your *offline life* over the past week e.g. anything you have done in your week that is not related to social media, such as seeing friends face-to-face, going to work or engaging in hobbies, please rate from 1-10 how consistent your behaviours have been with your values. 1 means that your *offline* behaviours have been completely inconsistent with your values in this area. 10 means that your *offline* behaviours have been completely consistent with your values.

	1	2	3	4	5	6	7	8	9	10	☺ N/A
Family (other than marriage or parenting)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marriage/couples/intimate relations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parenting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Friends/social life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education/training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recreation/fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spirituality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Citizenship/Community Life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Physical self care (diet, exercise, sleep)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental Issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Art, creative expression, and aesthetics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Setting your own social media goals in line with your values

Values can be particularly helpful when it comes to setting goals. If a value is the compass you are using to head you in a direction, a goal is a specific destination you hope to reach along the way.

Now that you have thought about your values in different areas, and therefore what is important to you in life, we would like you to create some goals in line with your values. We would like you to focus specifically on goals regarding how you would like to use *social media*.

We recommend that you make these SMART goals, meaning that they are:

- Specific: They should be well defined, clear, and unambiguous.
- Measurable: You should be able to measure your progress toward accomplishing your goals.
- Achievable: They should be possible to achieve.
- Realistic: They should be within reach.
- Timely: You should be able to achieve them by some target date.

This will give you the best chance of achieving your goals that you have set in line with your values.

For example, someone who has identified that they strongly value *closeness* in relationships may create a goal to send a WhatsApp voice note to a family member once a week on a Sunday evening

to keep in touch with them. Or, someone who has identified that they value *creativity* may create a goal of starting a photography account on Instagram and posting a new photo twice a week on a Wednesday and Friday.

If you haven't thought about your goals in this way before, or it's been a long time since you've set these kinds of goals, please don't worry if it takes you a few minutes to decide. It's more important for you to approach this task thoughtfully than quickly.

You can set between one and three goals, please list them below.

Goal 1

Goal 2

Goal 3

Time to use social media

We would now like you to open up a social media platform of your choice. Social media can include social networking sites, such as Facebook, Twitter or Instagram, but also messaging and media sharing platforms such as WhatsApp.

Please enter the platform you are going to use:

Now please use the social media platform of your choice for the next 5 minutes in any way you wish to. After this time, please return to this survey in order to complete a final set of questionnaires.

Please now set yourself a 5 minute timer.

## Appendix I: Control Intervention

Welcome to our programme on colours. The following exercises should take no more than 15-20 minutes to complete. We would like to invite you to read the text below carefully and complete the questionnaires. You will then be asked to create your own colour palette for a project based on the colours you have thought about. Finally, you will be asked to use a social media platform of your choice for 5 minutes, before completing some final questionnaires

Why are colours important?

Although we all know what colours are, have you ever considered why are they important to us as humans? We see colours every time we look around us, although we might not always be consciously aware of this.

Sir Isaac Newton discovered the colour spectrum in the 1700's and saw that each colour is defined by a different wavelength. Psychologists, such as Carl Jung, then went on to study the effects of colour on the human mind. In the present day colour psychology is primarily used in marketing and advertising.

Colour psychology is now a popular area of study, with lots of people being interested in how different colours carry different meanings and therefore have different psychological effects on us. Both cultural differences and personal preference can influence the impact of different colours on us. Our relationship with colours is longstanding, with the first research on colour describing how sunset colours can have a calming effect on humans.

Why do we have favourite colours?

Although one can't objectively designate one colour as superior to another, individuals tend to have different opinions about colours, and most people have a favourite colour. There are various theories as to why we have favourite colours, and not one is universally agreed upon.

Researchers have found that we tend to prefer colours that are associated with survival, safety and health. For example, bluish hues are more popular with adults than yellowish brown ones. The theory is that blue is associated with water and clear skies, while yellows and browns are linked to illness and decay. Thus, one possibility is that having a favourite colour is just a way to keep us safe.

Our life experiences and the culture we grow up in are also likely to play a role in our colour preferences. We see this when someone's favourite colour is also that of their favourite football team, or their favourite piece of clothing. For example, a study found that members of Berkeley University were more likely to favour the school's official colours than rival University Stanford's, suggesting that their favoured colours were influenced by the environments they spent time in.

### Colours on social media

Social media websites tend to use certain colours to convey certain things. In fact, one study found that 62 to 90% of visitors assess their first experience on a new website "based on colours alone".

On social media, the colour red, for example, is often used to signal danger or to grab our attention. You will often see it used to advertise sales, or warn of viruses. Blue however, is often used as a calming, trustworthy colour, and is used in the logos of lots of social media platforms such as Facebook and Twitter.

Social media sites might also pay attention to colour contrasts. High contrasts will make text more legible, e.g. white text on a dark background, or vice versa. This is preferable for text heavy social media platforms such as Twitter. This contrast draws attention and can make certain important elements stand out visually. However, too much colour contrast can wear out our eyes, so platforms will often pick one contrast to focus on and use throughout their materials.

### What are my favourite colours?

Now that we have explained what colours are, why we might have favourite colours, and how colours are used on social media, we would like you to identify your own favourite colours. To start doing this, we have listed several colours below.

	Dislike a lot (1)	2	3	4	5	6	7	8	9	Like a lot (10)
Blue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yellow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Red	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Purple	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Turquoise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
White	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Black	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brown	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Orange	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gray	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pink	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Holding in mind the colours that you have rated the highest, we would like you specify three things you are reminded of when you think of those colours. This could include anything such as household objects, places, food, the weather, people, animals or scenery:

Now we would like you to give a rating of how often you think you have seen these colours during the last week, once in online environments and once in offline environments. We are not asking you for a specific number of times you have seen each colour. We are asking for your opinion on whether you haven't seen the colours at all, have seen them sometimes, or have seen them a lot.

First, thinking about what you have seen online over the past week (on social media platforms, such as Facebook, Instagram, Twitter or WhatsApp) please rate from 1-10 how often you have seen each colour online.

1 means you never see the colour online. 10 means you see the colour online a lot.

	Never see them (1)	2	3	4	5	6	7	8	9	See them a lot (10)
Blue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yellow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Red	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Purple	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Turquoise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
White	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Black	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brown	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Orange	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gray	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pink	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Now, thinking about what you have seen offline over the past week, e.g. anything you have seen whilst engaging in the 'real' world, please rate from 1-10 how often you have seen each colour.

1 means you never see the colour offline. 10 means you see the colour offline a lot.

	Never see them (1)	2	3	4	5	6	7	8	9	See them a lot (10)
Blue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Yellow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Red	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Purple	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Turquoise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
White	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Black	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Green	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brown	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Orange	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gray	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pink	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Creating your own colour scheme



People often use a specific colour scheme when creating a website. This can tie the website together visually, and increase the enjoyment of the person using it.

Some people might like to combine preferred colours, particularly ones that go well together, to create a colour scheme. Others might like to draw on colours that carry meaning or grab attention. For example, in designing a website for a company that organises extreme sports expeditions, someone might create a colour scheme of yellow, red and black, since the colours are highly contrasting (and hence likely to grab attention), and linked to danger in nature (e.g. wasps and banded snakes).

Now that you have established your favourite colours and reflected on how you have encountered colours online and offline, we would like to guide you to create a colour scheme for an imagined website of your choice.

First, please pick a website to design (e.g. a website for a clothes shop):

Now, pick your colour scheme with your reasoning (in brief) in brackets, e.g. 'red (symbolises) danger' or 'green (favourite colour and complements colour 2)'. Please pick 3 colours:

Colour 1

Colour 2

Colour 3

### The Task

We would now like you to open up a social media platform of your choice. Social media can include social networking sites, such as Facebook, Twitter or Instagram, but also messaging and media sharing platforms such as WhatsApp.

Please enter the platform you are going to use:

Now please use the social media platform of your choice for the next 5 minutes in any way you wish to. After this time, please return to this survey in order to complete a final set of questionnaires. Please now set yourself a 5 minute timer.

## Appendix J: Positive Evaluation of Social Media Use Questionnaire (PESMUQ)

To what extent do you think social media on balance

	Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly Agree
is good for your mental health and wellbeing?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is a force for good in your life?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
supports you in living the life you want to live?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
supports you in your interests and doing things you care about?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
helps you to feel connected to others?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
helps you to have meaningful interactions with others?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix K: Analysis of T1-T3 Data Completed Within 31 Days and Outlier-Adjusted Test Results

### 1. PESMUQ

No outliers.

#### Supplementary Table 2

*Independent-samples t-test results: Intergroup differences in PESMUQ scores at T2 and T3*

	Intervention (n=71)	Control (n=97)	<i>t</i> (166)	<i>p</i>	Cohen's <i>d</i>
T1-T3 within a month (N=168)	M (SD)	M (SD)			
T2	26.9 (8.06)	26.2 (7.25)	-.544	.587	-.085
T3	27.4 (7.14)	28.2 (6.66)	.763	.447	.119

### 2. VLQ

Outliers: 2 x intervention group at T3, 2 x control group at T3.

#### Supplementary Table 3

*Independent-samples t-test results: Intergroup differences in VLQ online composite scores at T3*

	Intervention	Control	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M (SD)</i>	<i>M (SD)</i>			
Without outliers (N=186)	45.7 (13.7)	47.3 (11.8)	.858	.392	.127
T1-T3 within a month (N=168)	47.2 (15.5)	48.6 (13.6)	.593	.554	.093

### Supplementary Table 4

Paired-samples *t*-test results: differences in VLQ online composite scores between T1 and T3 for intervention group only

	T1	T3	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M (SD)</i>	<i>M (SD)</i>			
Without outliers (N=80)	45.1 (15.4)	45.7 (13.7)	-.501	.618	-.056
T1-T3 within a month (N=71)	45.9 (16.1)	47.2 (15.5)	-1.03	.306	-.121

### 3. SCS

No outliers.

### Supplementary Table 5

Mixed ANOVA results: Intergroup differences in SCS scores at T1, T2 and T3 post-exclusion of individuals that completed T1-T3 longer than 31 days

		Baseline (T1)	Post-intervention (T2)	Follow-up (T3)	ANOVA condition	Mean square	<i>F</i> (1, 188)	<i>p</i>	$\eta^2_p$
		<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>					
T1-T3 within a month (N=168)	In (n=71)	36.7 (9.18)	37.03(10.03)	36.6 (10.7)	Timepoint	32.56	1.646	.194	.010
	Con (n=97)	35.6 (10.5)	36.90 (9.91)	37.1 (9.78)	Group	2.727	0.031	.860	<.001
					Timepoint* Group	30.158	1.525	.210	.009

#### 4. WEMWBS

Outliers: 1 x control group at T1, 1 x control group at T3.

#### Supplementary Table 6

*Mixed ANOVA results: Intergroup differences in WEMWBS scores at T1 and T3 without outliers, and post-exclusion of individuals that completed T1-T3 longer than 31 days*

		Baseline (T1)	Follow- up (T3)	ANOVA condition	Mean square	<i>F</i> (1, 188)	<i>p</i>	$\eta^2_p$
		<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )					
Without outliers	Intervention	49.2 (7.32)	48.54 (7.85)	Timepoint	4.98	0.370	.544	.002
	Control	47.50 (8.20)	47.67 (8.71)	Group	75.2	1.279	.259	.007
				Timepoint* Group	14.2	1.052	.306	.006
T1-T3 within a month (N=168)	Intervention (n=71)	49.3 (7.27)	48.7 (8.19)	Timepoint	2.26	0.172	.679	.001
	Control (n=97)	47.2 (8.94)	47.6 (9.33)	Group	106.5	1.589	.209	.009
				Timepoint* Group	20.2	1.532	.218	.009

## Appendix L: Analyses including all available data at each timepoint

### 1. PESMUQ

#### Supplementary Table 7

*Independent-samples t-test results: Intergroup differences in PESMUQ scores at T2*

Intervention (n=126)	Control (n=137)	<i>t</i> (261)	<i>p</i>	<i>Cohen's d</i>
M (SD)	M (SD)			
26.7 (7.23)	26.3 (7.36)	-.474	.636	-.059

#### Supplementary Table 8

*Independent-samples t-test results: Intergroup differences in PESMUQ scores at T3*

Intervention (n=92)	Control (n=112)	<i>t</i> (202)	<i>p</i>	<i>Cohen's d</i>
M (SD)	M (SD)			
27.0 (7.06)	27.8 (6.62)	.855	.394	.120

### 2. VLQ

#### Supplementary Table 9

*Independent-samples t-test results: Intergroup differences in VLQ online composite scores at T3*

Intervention (n=82)	Control (n=108)	<i>t</i> (188)	<i>p</i>	<i>Cohen's d</i>
M (SD)	M (SD)			
46.9 (15.3)	48.1 (13.1)	.640	.523	.094

### Supplementary Table 10

Paired-samples *t*-test results: differences in VLQ online composite scores between T1 and T3 for intervention group only

T1	T3	<i>t</i> (81)	<i>p</i>	Cohen's <i>d</i>
<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )			
46.0 (16.1)	46.9 (15.3)	-.753	.454	-.083

### 3. PANAS

### Supplementary Table 11

Mixed ANOVA results: Intergroup differences in PANAS scores at T1 and T3

		T1	T2	ANOVA condition	Mean square	<i>F</i> (1, 262)	<i>p</i>	$\eta^2_p$
		<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )					
Positive affect	Intervention (n=126)	25.7 (7.86)	23.9 (8.77)	Timepoint	261.7	16.7	<.001	.080
	Control (n=138)	25.7 (7.91)	24.7 (9.09)	Group	22.1	0.18	.676	.001
				Timepoint* Group	15.6	1.00	.319	.004
Negative affect	Intervention (n=126)	16.5 (7.61)	15.1 (7.05)	Timepoint	47.8	5.13	.024	.019
	Control (n=138)	16.6 (7.85)	16.6 (8.47)	Group	109.0	0.98	.324	.004
				Timepoint* Group	75.02	7.24	.020	.022

#### 4. SCS

**Supplementary Table 12**

*Mixed ANOVA results: Intergroup differences in SCS scores at T1, T2 and T3*

	T1	T2	T3	ANOVA condition	Mean square	F (2, 376)	p	$\eta^2_p$
	<hr/>							
	M (SD)	M (SD)	M (SD)					
In (n=82)	36.4 (9.20)	36.9 (9.99)	36.7 (10.3)	Timepoint	25.3	1.18	.309	.006
Con (n=108)	35.7 (10.5)	36.1 (10.4)	36.8 (9.62)	Group	32.6	0.13	.723	.001
				Timepoint* Group	11.0	0.52	.598	.003

#### 5. WEMWBS

**Supplementary Table 13**

*Mixed ANOVA results: Intergroup differences in WEMWBS scores at T1 and T3*

	T1	T3	ANOVA condition	Mean square	F (1,200)	p	$\eta^2_p$
	<hr/>						
	M (SD)	M (SD)					
In (n=90)	48.7 (7.30)	48.6 (7.81)	Timepoint	0.07	0.01	.946	<.001
Con (n=112)	47.1 (8.81)	47.2 (9.10)	Group	238.9	1.90	.169	.009
			Timepoint* Group	1.58	0.11	.741	.001



6. CompACT

**Supplementary Table 14**

*Correlation results between CompACT scores at T1 and changes in VLQ, WEMWBS and SCS scores*

Change score variables	CompACT- Total	CompACT-OE <sup>a</sup>	CompACT-BA <sup>b</sup>	ComACT-VA <sup>c</sup>
VLQ Online Composite	.121	.129	.060	.130
PANAS Positive Affect	-.055	-.070	-.044	-.040
SCS	-.037	-.013	-.087	-.049
WEMWBS	-.050	-.029	.002	-.115

*Note* : no correlations were significant at  $p < .013$  nor at  $p < .05$ .

<sup>a</sup>CompACT-OE= CompACT openness to-experience subscale

<sup>b</sup>CompACT-BA = CompACT behavioural awareness subscale

<sup>c</sup>CompACT-VA = CompACT valued action subscale

## Appendix M: Non-normally distributed data

### SCS

#### T1

- Intervention:
  - Skewness: -.813
  - Kurtosis: -.033
  - K-S Lillefors test:
    - $D(82) = 0.143, p < .001$
- Control:
  - Skewness: -.822
  - Kurtosis: -.214
  - K-S Lillefors test:
    - $D(108) = 0.161, p < .001$

#### T2

- Intervention:
  - Skewness: -.771
  - Kurtosis: -.299
  - K-S Lillefors test:
    - $D(82) = 0.138, p < .001$
- Control:
  - Skewness: -.667
  - Kurtosis: -.484
  - K-S Lillefors test:
    - $D(107) = 0.128, p < .001$

#### T3

- Intervention:
  - Skewness: -.986
  - Kurtosis: .297
  - K-S Lillefors test:
    - $D(82) = 0.137, p < .001$
- Control:
  - Skewness: -.761
  - Kurtosis: -.280
  - K-S Lillefors test:
    - $D(108) = 0.146, p < .001$

### PESMUQ

#### T2

- Intervention:
  - Skewness: -.510
  - Kurtosis: -.471
  - K-S Lillefors test:
    - $D(82) = 0.127, p = .002$

#### T3

- Intervention:
  - Skewness: -.549
  - Kurtosis: .016
  - K-S Lillefors test:
    - $D(82) = 0.110, p = .016$

## Appendix N: Logistic regression models predicting completion of measures

**Supplementary Table 15**

*Logistic regression model 1: predicting completion of T2 PESMUQ*

	OR (95% CI)	P-value
T1 PANAS – Positive Affect	0.99 (0.95-1.03)	.521
T1 PANAS – Negative Affect	1.00 (0.96-1.04)	.997
T1 WEMWBS	1.02 (0.97-1.97)	.490
T1 SCS	1.00 (0.96-1.04)	.859
T1 CompACT	1.00 (0.98-1.01)	.651
Age	1.05 (0.95-1.18)	.330
Sex		
Male	1.00	.950
Female	0.95 (0.49-1.85)	.875
Ethnicity		
White	1.00	.769
Mixed	0.82 (0.21-3.20)	.778
Any other mixed background	0.46 (0.13-1.65)	.234
Asian or Asian British	1.74 (0.63-4.81)	.284
Black or Black British	0.95 (0.24-3.84)	.946
Any other ethnic group	0.56 (0.09-3.55)	.540

**Supplementary Table 16**

*Logistic regression model 2: predicting completion of T3 PESMUQ*

	OR (95% CI)	P-value
T1 PANAS – Positive Affect	0.99 (0.95-1.02)	.491
T1 PANAS – Negative Affect	1.00 (0.97-1.04)	.980
T1 WEMWBS	1.01 (0.97-1.05)	.581
T1 SCS	1.00 (0.97-1.03)	.935
T1 CompACT	1.00 (0.99-1.02)	.995
Age	1.01 (0.92-1.10)	.874
Sex		
Male	1.00	.232
Female	1.59 (0.93-2.69)	.987
Ethnicity		
White	1.00	.934
Mixed	1.48 (0.43-5.06)	.531
Any other mixed background	0.81 (0.25-2.70)	.736
Asian or Asian British	1.14 (0.55-2.36)	.727
Black or Black British	0.54 (0.17-1.75)	.306
Any other ethnic group	0.84 (0.13-5.36)	.855

**Supplementary Table 17***Logistic regression model 3: predicting completion of T3 VLQ*

	OR (95% CI)	P-value
T1 PANAS – Positive Affect	0.99 (0.95-1.02)	.491
T1 PANAS – Negative Affect	1.00 (0.97-1.04)	.980
T1 WEMWBS	1.01 (0.97-1.05)	.581
T1 SCS	1.00 (0.97-1.03)	.935
T1 CompACT	1.00 (0.96-1.02)	.995
Age	1.01 (0.92-1.10)	.874
Sex		
Male	1.00	.232
Female	1.59 (0.93-2.69)	.087
Ethnicity		
White	1.00	.934
Mixed	1.48 (0.43-5.06)	.531
Any other mixed background	0.81 (0.25-2.70)	.736
Asian or Asian British	1.14 (0.55-2.36)	.727
Black or Black British	0.54 (0.17-1.75)	.306
Any other ethnic group	0.84 (0.13-5.36)	.855

**Appendix O: Correlation Results Between CompACT Subscale Scores at T1 and Changes In VLQ, WEMWBS and SCS scores**

Variable	CompACT-OE <sup>a</sup>	CompACT-BA <sup>b</sup>	ComACT-VA <sup>c</sup>
VLQ Online Composite change Score	.129	.060	.130
PANAS Positive Affect change score	-.006	.049	-.064
SCS change score	-.118	-.162	-.099
WEMWBS change score	-.150	-.104	-.203

*Note* : no correlations were significant at  $p < .013$  nor at  $p < .05$ .

<sup>a</sup>CompACT-OE= CompACT openness to-experience subscale

<sup>b</sup>CompACT-BA = CompACT behavioural awareness subscale

<sup>c</sup>CompACT-VA = CompACT valued action subscale

## Appendix P: Thematic Analysis Of Goals

Values-consistent goals	Themes	Sub-themes	Sub-sub-theme
Check in with my family more often (once a week).	Both/unclear	Social connection	Family
Speak to my mum daily	Both/unclear	Social connection	Family
Keeping in touch with friends	Both/unclear	Social connection	Friendship and support
Reconnect with close friends I haven't spoken to in a while.	Both/unclear	Social connection	Friendship and support
Connect with others applying to DCILPsy	Both/unclear	Social connection	Friendship and support
Spending 5-10 minutes keeping up with friends who I do not contact as often	Both/unclear	Social connection	Friendship and support
Send a message to my friends about organising a trip or a dinner	Both/unclear	Social connection	Friendship and support
Closeness	Both/unclear	Social connection	
Keep connected to family	Both/unclear	Social connection	Family
Ensure in September, I do well-being check in every week (Wednesday?) with the children.	Both/unclear	Social connection	Family
Chat to my best friend weekly	Both/unclear	Social connection	Friendship and support
Ask how a friend is doing	Both/unclear	Social connection	Friendship and support
Try to make one acquaintance every week	Both/unclear	Social connection	Friendship and support
talking to your family member a few times during the day	Both/unclear	Social connection	Family
Make sure I'm reaching out to 2 friends a week to catch up to arrange face to face meetings	Both/unclear	Social connection	Friendship and support
Find a career that i like and I feel good in	Offline behaviours changes	Employment, Education & Training (EET)	Career
Sign up for masters in September for ed psych	Offline behaviours changes	Employment, Education & Training (EET)	Education
Do my Arabic homework every week and practise Arabic listening	Offline behaviours changes	Employment, Education & Training (EET)	Homework
Spend more time studying - keep on top of to do list every day	Offline behaviours changes	Employment, Education & Training (EET)	Education
Taking time off social media and spending it outside or doing exercise one evening/afternoon a week	Offline behaviours changes	Health and wellbeing	
Practice selfcare to become more independent	Offline behaviours changes	Health and wellbeing	
Increase time outside in nature	Offline behaviours changes	Health and wellbeing	
To walk the dog every morning to help my exercise	Offline behaviours changes	Health and wellbeing	
Go for a run today	Offline behaviours changes	Health and wellbeing	
Spend less time on social media and more exercising	Offline behaviours changes	Health and wellbeing	
Exercise for at least 20 min per day	Offline behaviours changes	Health and wellbeing	
To attend exercise classes this week	Offline behaviours changes	Health and wellbeing	
To drink more water every day	Offline behaviours changes	Health and wellbeing	
Creativity/ spirituality - make a mood board this week	Offline behaviours changes	Health and wellbeing	

To shut off from work entirely one weekend day this week	Offline behaviours changes	Health and wellbeing	
To try and do colouring rather than social media twice a week	Offline behaviours changes	Hobbies	Creativity
Learn something new (can be random)	Offline behaviours changes	Hobbies	
Sketch for at least 1 hour per week	Offline behaviours changes	Hobbies	Creativity
Practise writing at least once a week on the weekends	Offline behaviours changes	Hobbies	Creativity
Learn something new everyday	Offline behaviours changes	Hobbies	
Play music at least once per week	Offline behaviours changes	Hobbies	Music
Create digital sketches	Offline behaviours changes	Hobbies	Creativity
To prep maps for dnd session	Offline behaviours changes	Hobbies	Gaming
Do more of my chores	Offline behaviours changes	Other	
Spend quality time with my parents at least 3 evenings a week without using my phone	Offline behaviours changes	Social connection	Family
Have a date night with my partner once a week	Offline behaviours changes	Social connection	Romantic partners
Spend more time with friends. Visit and make time for friends once a week.	Offline behaviours changes	Social connection	Friendship and support
To put my phone down when spending time with friends over the next month.	Offline behaviours changes	Social connection	Friendship and support
To make plans with family and friends for Christmas by the end of next week	Offline behaviours changes	Social connection	Friendship and support
See family more than once a month in 2023	Offline behaviours changes	Social connection	Family
Spend more time with family e.g an hour in the evenings	Offline behaviours changes	Social connection	Family
Make conversation daily with family at home	Offline behaviours changes	Social connection	Family
Have 15 mins phone/screen free dedicated child time	Offline behaviours changes	Social connection	Family
Have dinner with my boyfriend	Offline behaviours changes	Social connection	Family
Relationships - be creative once a week in thinking of a fun surprise for my partner	Offline behaviours changes	Social connection	Romantic partners
Go to the theatre and similar networking events at least twice a month in 2023	Offline behaviours changes	Social connection	Romantic partners
Connect with family on next trip home	Offline behaviours changes	Social connection	Friendship and support
Speak to strangers more in a friendly way	Offline behaviours changes	Social connection	Family
Don't use or check phone while spending time with people	Offline behaviours changes	Social connection	Strangers
Spend 10 minutes unfollowing instagram accounts that I'm not interested in	Online behaviour changes	Social connection	
unfollow or mute accounts that post bikini or posing pictures that make me feel bad about my body by Monday, follow more healthy eating and exercise/running accounts instead	Online behaviour changes	Engagement with specific content	Engagement with specific content
Build faith and understanding through watching faithful preachers (one video a day)	Online behaviour changes	Engagement with specific content	Ethical engagement
Identify 10 new accounts to follow on instagram of people from different backgrounds (eg class, ethnicity, body shape, gender) to broaden my exposure to different groups in society	Online behaviour changes	Engagement with specific content	

Taking in/not ignoring more educational content	Online behaviour changes	Engagement with specific content	
Find something joyful to watch on social media every weekend	Online behaviour changes	Engagement with specific content	
Engage more actively with climate justice understanding while using social media	Online behaviour changes	Engagement with specific content	
Share opinion on posts as opposed to just ,Åú lurking,Åú	Online behaviour changes	Engagement with specific content	
Engage with swimming tutorial videos on Youtube once a week	Online behaviour changes	Engagement with specific content	
Engage in discussion on the aspiring psychologist page once a week	Online behaviour changes	Engagement with specific content	
Follow a fun educational Instagram page	Online behaviour changes	Engagement with specific content	
Follow more spiritual pages on Instagram	Online behaviour changes	Engagement with specific content	
Watch different styles of yoga for ideas	Online behaviour changes	Engagement with specific content	
Report all advertisements on my instagram feed that relate to dieting	Online behaviour changes	Engagement with specific content	Ethical engagement
To follow Instagram accounts about nature and travel	Online behaviour changes	Engagement with specific content	
Keep up with the news	Online behaviour changes	Engagement with specific content	
Report all hate comments I come across	Online behaviour changes	Engagement with specific content	Ethical engagement
Find 3 people to follow that focus on environmental issues/sustainability (on instagram)	Online behaviour changes	Engagement with specific content	
I want to follow more eco friendly pages on Instagram in the next 2 weeks to find more manageable ways to implement being green in my day to day life.	Online behaviour changes	Engagement with specific content	
Explore my favourite bands on youtube (note: I find it hard to set long term online plans!)	Online behaviour changes	Engagement with specific content	
I use social media compulsively to distract from intrusive thoughts. So my goal would be to only use social media when necessary (i.e. responding to a notification)	Online behaviour changes	Nature of engagement	Mindful Engagement
I will reduce the amount of mindless to 30 minutes a day (max)	Online behaviour changes	Nature of engagement	Mindful Engagement
Post on my photography/art Instagram once a week	Online behaviour changes	Nature of engagement	More active, intentional posting
Posting or not posting authentically	Online behaviour changes	Nature of engagement	Mindful Engagement
I would like to stop scrolling mindlessly right before bed each day	Online behaviour changes	Nature of engagement	Mindful Engagement
Limit my use of social media to be less automatic	Online behaviour changes	Nature of engagement	Engagement
			More active, intentional posting
Post more about Christianity	Online behaviour changes	Nature of engagement	More active, intentional posting
Upload family photos to Instagram twice a week for Apna Ki Drishti	Online behaviour changes	Nature of engagement	More active, intentional posting
To post a new bookstagram post once every two weeks	Online behaviour changes	Nature of engagement	More active, intentional posting
Engage more authentically	Online behaviour changes	Nature of engagement	Mindful Engagement
Continue to avoid using social media as a way to validate that I,Åôm enjoying my life	Online behaviour changes	Nature of engagement	Mindful Engagement



Compare myself less to others	Online behaviour changes	Nature of engagement	Mindful Engagement More active, intentional posting
post once a week on my crochet instagram account	Online behaviour changes	Nature of engagement	Mindful Engagement More active, intentional posting
Taking memorable photos of best memories that occur in a month	Online behaviour changes	Nature of engagement	Mindful Engagement More active, intentional posting
Creativity - post at least one new photo or video to food account from recent holiday	Online behaviour changes	Nature of engagement	Mindful Engagement More active, intentional posting
Post a new photo weekly on my creative Instagram account.	Online behaviour changes	Nature of engagement	Mindful Engagement More active, intentional posting
Less mindless scrolling	Online behaviour changes	Nature of engagement	Mindful Engagement More active, intentional posting
Share one instagram story a week with something aesthetic thats brought me joy	Online behaviour changes	Nature of engagement	Mindful Engagement More active, intentional posting
To focus only family/friends on instagram rather than mindless scrolling	Online behaviour changes	Nature of engagement	Mindful Engagement More active, intentional posting
Review photos from my holiday and post on Instagram	Online behaviour changes	Nature of engagement	Mindful Engagement More active, intentional posting
Less screen time and more being present	Online behaviour changes	Reducing use	
Spend less time on social media by limiting the use of it for 30 minutes at a time and set an alarm when that time is up	Online behaviour changes	Reducing use	
I would like to limit social media use to 30 mins per day	Online behaviour changes	Reducing use	
Limit social media use to an hour max per day	Online behaviour changes	Reducing use	
Spend less time on social media, limit Instagram to 3 times a week (or delete it again temporarily)	Online behaviour changes	Reducing use	
Cut down social media use and use this for a maximum of 1 hour a day	Online behaviour changes	Reducing use	
Put away phone by 11pm latest	Online behaviour changes	Reducing use	
Don't go on social media before I get to work.	Online behaviour changes	Reducing use	
Avoid using social media between 11pm and 7am	Online behaviour changes	Reducing use	
Stay off social media 30 min before bed	Online behaviour changes	Reducing use	
Blocking social media at work to avoid distraction	Online behaviour changes	Reducing use	
Avoid using social media before bed	Online behaviour changes	Reducing use	
Screen time of social media less than 1.5 hrs per day	Online behaviour changes	Reducing use	
Take phone breaks at work where my phone is not accessible for hours at a time	Online behaviour changes	Reducing use	
Stick to my 15 minute limit on Instagram per day instead of dismissing the reminder.	Online behaviour changes	Reducing use	
Turn off my phone 20 mins before trying to sleep and stop accessing social media	Online behaviour changes	Reducing use	
Call my mum at least once a week for 30 minutes+	Online behaviour changes	Social connection	Family
Message a family member daily	Online behaviour changes	Social connection	Family
Call my dad daily when he,Äôs away	Online behaviour changes	Social connection	Family

Send a message a least 5 times a week to my siblings on facebook	Online behaviour changes	Social connection	Family
To WhatsApp my grandad once a week	Online behaviour changes	Social connection	Family
Share something I'm doing once a week on the family WhatsApp	Online behaviour changes	Social connection	Family
To contact with cousins at least once this week	Online behaviour changes	Social connection	Family
Family - reinstate weekly calls with my grandparents	Online behaviour changes	Social connection	Family
To send a message a day to my family on WhatsApp	Online behaviour changes	Social connection	Family
To whatsapp call family more	Online behaviour changes	Social connection	Family
WhatsApp my mom everyday	Online behaviour changes	Social connection	Family
Call family once a week	Online behaviour changes	Social connection	Family
Reach out to my family more often on WhatsApp by messaging my brother once a week	Online behaviour changes	Social connection	Family
Send a facebook message to my sister every week to check in with how she's doing	Online behaviour changes	Social connection	Family
Call mum at least once per month	Online behaviour changes	Social connection	Family
To continue to voicenote family a few times a week	Online behaviour changes	Social connection	Family
Sending a voice note to my mum and dad once every Sunday with an update on my week	Online behaviour changes	Social connection	Family
Send a snapchat to my family at least once a day	Online behaviour changes	Social connection	Family
Message my sisters at least once a week	Online behaviour changes	Social connection	Family
Video call my parents once a week	Online behaviour changes	Social connection	Family
Message my family group chat every friday	Online behaviour changes	Social connection	Family
FaceTime my grandparents	Online behaviour changes	Social connection	Family
I want to post on Instagram to provide updates to my loved ones at least every other month	Online behaviour changes	Social connection	Family
Message my dad every other day to check in on him	Online behaviour changes	Social connection	Family
encourage family via whatsapp	Online behaviour changes	Social connection	Family
Call my parents once a week	Online behaviour changes	Social connection	Family
Text my family more often	Online behaviour changes	Social connection	Family
More time calling family this week	Online behaviour changes	Social connection	Family
Have a phone call with close friends once every couple weeks.	Online behaviour changes	Social connection	Friendship and support
Send an encouraging message to a friend	Online behaviour changes	Social connection	Friendship and support
Check in with my close friends once a week	Online behaviour changes	Social connection	Friendship and support
To use platforms to show support to my friends	Online behaviour changes	Social connection	Friendship and support
Create a group chat with friends from Uni I haven't spoken to in a while	Online behaviour changes	Social connection	Friendship and support
I want to connect with my friends via Instagram monthly and video chat monthly also.	Online behaviour changes	Social connection	Friendship and support

Be more active on friend group chats	Online behaviour changes	Social connection	Friendship and support
Using social media to reach out to lost contacts	Online behaviour changes	Social connection	Friendship and support
Send memes to mates	Online behaviour changes	Social connection	Friendship and support
encourage friends via whatsapp	Online behaviour changes	Social connection	Friendship and support
Message or ask about 1 friend each day	Online behaviour changes	Social connection	Friendship and support
I will give kind and positive feedback on my friend,Ãs social posts.	Online behaviour changes	Social connection	Friendship and support
FaceTime a friend from home once a week even for 5 minutes	Online behaviour changes	Social connection	Friendship and support
To respond to friends messages on whatsapp more consistently	Online behaviour changes	Social connection	Friendship and support
Check up on a friend	Online behaviour changes	Social connection	Friendship and support
Chatting with your friends on Facebook for kindness once in 2 days	Online behaviour changes	Social connection	Friendship and support
Make more of an effort to reach out to friends e.g send a check in text if haven,Ãt spoke for a week or two	Online behaviour changes	Social connection	Friendship and support
Join a group online for some hobbies I am interested in (connect with others and spend more time on recreation)	Online behaviour changes	Social connection	Friendship and support
Utilize my WhatsApp group message with my prayer trio from church to ask for prayer requests and prayer together	Online behaviour changes	Social connection	Friendship and support
Consistently reply/reach out to friends I know are struggling/undergoing change	Online behaviour changes	Social connection	Friendship and support
Sending at least 1 voice note on Whatsapp to show my engagement in friendships	Online behaviour changes	Social connection	Friendship and support
send pictures of holiday to friends	Online behaviour changes	Social connection	Friendship and support
Send partner interesting/relatable photos/images daily	Online behaviour changes	Social connection	Romantic partners
Consistency - keep up with WhatsApp messages and reply to messages within 2 days of receipt	Online behaviour changes	Social connection	
I would like to respond to messages within 15 mins	Online behaviour changes	Social connection	
Use social media to connect with family and friends more	Online behaviour changes	Social connection	
To connect with friends and family on Instagram regularly	Online behaviour changes	Social connection	
To respond to messages quicker and not put off replying to people I don,Ãt see as much	Online behaviour changes	Social connection	
Send at least 1 individual message per montj	Online behaviour changes	Social connection	
Send ,Ãare you okay,Ã messages to contacts	Online behaviour changes	Social connection	
Using video calls / voicenotes to build closer relationship	Online behaviour changes	Social connection	

