

*Online* peer support and recovery in depression: The role of  
user engagement

Master thesis

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## Abstract

Due to its chronic and recurrent nature, a recovery paradigm prioritizing building resilience and adaptation to depression has to be implemented. *Online* peer support interventions (PSIs) have shown to improve recovery in people with depression, while it is yet unknown which recovery-oriented aspects are targeted specifically and to what degree user engagement fosters these improvements. Therefore, this study investigated the effect of an *online* PSI on the recovery-oriented aspects social support and participation, taking into account user engagement. A sample of 73 participants filled out an assessment measuring social support and participation at the start and after 6-months of engaging with the *online* PSI while user engagement was tracked. The results indicate improvements in social support and participation after engagement with the *online* PSI. However, these improvements were irrespectively of the amount of user engagement. This study expanded our knowledge concerning recovery-oriented benefits of *online* PSIs for people with depression.

*Keywords:* Depression, Online Peer Support Interventions, Recovery

Depression, characterized by a persistent feeling of sadness and loss of interest, is considered a major public health problem worldwide (Jacob, 2012; WHO, 2021). The disorder is associated with significant disability, suicide, and economic burden (Friedrich, 2017; Greenberg et al., 2021; Hawton et al., 2013). Depression has a chronic nature, with many experiencing continuous depressive symptoms over 2 years (American Psychiatric Association [APA], 2022), as well as a recurrent nature, with recent findings indicating that at least 50% of the individuals developing a first lifetime episode of depression will incur a second one (Bains & Abdijadid, 2022). Due to this chronic and recurrent nature of depression, it is of high relevance to implement a recovery paradigm prioritizing building resilience and adaptation to depression beyond mere symptom reduction.

Literature on the recovery paradigm distinguishes three recovery-oriented categories: (1) *clinical recovery*, commonly defined as the reduction of psychiatric symptoms (Cavelti et al., 2012); (2) *personal recovery*, concerning the individual psychological adaptation process to a disorder (i.e., CHIME: Connectedness/social support, Hope, Identity, Meaning, Empowerment; Cavelti et al., 2012; Leamy et al., 2011); and (3) *functional recovery*, indicating the degree of “functioning” (i.e., performance of daily and social activities required for self-maintenance; Harvey & Bellack, 2009; Robinson et al., 2004). With the aim of supporting a life beyond services prioritizing resilience and adaptation, mental health policies

worldwide have increasingly focused on promotion of latter two categories of recovery (Piat et al., 2021).

One promising intervention consistent with the recovery paradigm is peer support interventions (PSIs; Farkas & Anthony, 2010; Huang et al., 2020). Peer support in this context refers to individuals with a similar (serious) mental illness exchanging information, sharing experiences, and encouraging or helping each other to overcome challenges (Munce et al., 2017; Park et al., 2018). A systematic review by Winsper et al. (2020) highlights the superiority of PSIs in initiating recovery compared to other recovery-oriented interventions, due to its unique provision of role models for individual recovery on top of common mechanisms of action, enabling users to make upward social comparisons (Wood, 1996). Specifically, due to its low costs, high accessibility and possible anonymity, *online* PSIs have been a topic of interest (Smit et al., 2022; Wright et al., 2003). Patients with depression might benefit from this type of intervention specifically as it may decrease experienced stigma (Burke et al., 2019), social isolation (Dennis, 2003) and serve as practice for self-disclosure in the *offline* world (Smit et al. 2021). Indeed, research shows improvement in the recovery-oriented categories after engagement with an *online* PSI in individuals with depression (Smit et al., 2022).

Although research points toward a positive relation between *online* PSIs and recovery-oriented categories in depression, research investigating the effect of such interventions on individual aspects of the recovery-oriented categories in isolation has been scarce, while the importance has been highlighted before (Leamy et al., 2011; Weeghel et al., 2019). For instance, Smit et al. (2022) has stressed the importance of assessing recovery-related indices separately and in depth to improve validity of their findings. Investigating this effect will expand our knowledge concerning which aspects of recovery are targeted by *online* PSIs specifically (and which not), which will increase specificity and might identify aspects of recovery still left to be stimulated. Therefore, this study aimed to fill this gap in literature by investigating the effect of an *online* PSI (i.e., Depression Connect; Smit et al., 2021) on two relevant individual aspects of the recovery-oriented categories *personal* and *functional recovery*.

The relevant individual recovery-oriented aspect of the category *personal recovery* investigated in relation to the *online* PSI was social support. Social support has been referred to as the perception and actuality that one is cared for, respected, and part of a social network (e.g., family, friends, neighbors, community) available in times of need (Taylor, 2011). This aspect is relevant for individuals with depression as, according to the stress-buffering model,

social support functions as a buffer against detrimental effects of stressful life events on mental health (Windle, 1992), meaning that social support might protect individuals from depression. In line with this, absence of social support has been associated with onset and relapse of depression (Paykel, 1994). The protective function of social support against (recurrent) depression and the experienced lack of it reported by depressed people (Smit et al., 2021) makes social support target for intervention. The *online* PSI was expected to increase the experience of social support in individuals with depression as it, for instance, might decrease social isolation (Burke et al., 2019) and/or supplement *offline* support (Smit et al., 2021; Cheng & Vicera, 2022). As such, an increase of social support over time was expected to relate to interaction with the *online* PSI.

The important individual recovery-oriented aspect of the category *functional recovery* investigated in relation to the *online* PSI was participation. The International Classification of Functioning, Disability and Health (ICF; WHO, 2001) defines participation as involvement in all areas of life, representing the societal perspective of functioning (of an individual as a member of society). Growing evidence indicates that involvement in social activities is an important determinant of mental health (Luo et al., 2020), has been associated with decreases in depressive symptoms (Wang et al., 2022), and contributes to a sense of meaning in life in individuals with depression (Abuy-Rayya, 2006; Bourassa et al., 2015). However, depressive symptoms, such as fatigue or loss of interest, can affect one's ability to fulfil social roles and take part in society (Fiske et al., 2009). Therefore, finding ways to stimulate participation in individuals with depression is of high relevance, making it target for intervention as well. The *online* PSI was expected to increase participation as it might function as practice to engage in such activities and/or lower the threshold to do so (Strand et al., 2020; Smit et al., 2021). As such, an increase of participation over time was expected to relate to interaction with the *online* PSI.

Aside from investigating whether there is an overall effect of *online* PSIs on aspects of recovery categories, literature has also stressed the importance of discovering what frequency and amount of engagement with the service yields optimal benefits (Alvarez-Jiminez et al., 2016; Smit et al., 2022; Vayshenker et al., 2016). Specifically, it is hypothesized that high engagement is related to greater improvements over time (Carron-Arthur et al., 2015; Griffiths et al., 2009; Huang et al., 2020; Smit et al., 2022; Vayshenker et al., 2016), similarly to the positive association between client participation in psychotherapy and improvements (Garfiel, 1978; Luborsky et al., 1971; Luborsky et al., 1980; Nelson & Borkovec, 1989; Orlinsky & Howard, 1978). Higher user engagement with the platform was expected to

increase received peer support, thereby possibly contributing to recovery-oriented improvements. Therefore, this study investigated the effect of user engagement with the *online* PSI on the recovery-oriented aspects social support and participation as well, hypothesizing higher user engagement to relate to greater improvements over time. Overall, this study was intended to expand our knowledge concerning the potential recovery-oriented benefits of *online* PSI for individuals struggling with depression and the most effective manner to use *online* PSIs to achieve such benefits.

## **Methods**

This study made use of existing data from a larger, quantitative study conducted by Smit et al. (2022) on the *online* platform Depression Connect (DC; Smit et al., 2021), which was determined to not require ethical approval by the local ethics committee (Commissie Mensgebonden Onderzoek Arnhem-Nijmegen) due to minimal burden to participants.

### *Depression Connect (DC)*

The *online* intervention used to facilitate peer support for people coping with depression was Depression Connect (DC; Smit et al., 2021). This platform was developed by the Depression Association, the Centre of Expertise for Depression (part of the Pro Persona Institute for mental health care), and the Radboud University Medical Centre, the Netherlands, and launched on June 19, 2019. The website was designed to offer individuals struggling with depression to (anonymously) read or exchange knowledge and experiences regarding coping with depression. To ensure a constructive and supportive atmosphere, moderators screened posts twice a day. Members of the platform were able to start new discussion topics or join one of the eight predetermined topics (based on the experiential knowledge themes identified in Smit et al., 2020). Besides this, members could read and post messages on the forum, and send private messages to other users. For more details on DC, see Smit et al. (2021).

### *Procedure*

All individuals registered at the launch of DC on June 19, 2019 and new members up until September 24, 2020 received an email with information on the study, an invitation to participate as well as contact information. Participation was completely voluntarily, and participants did not receive any financial- or other compensation. Those interested to participate provided consent in a digital form to log and analyze their data and were asked to

complete the survey at three timepoints: (1) at baseline: 1 or 2 days after joining DC, (2) 3 months-, and (3) 6 months after joining DC. Due to the restrictiveness of this paper, only those that at least completed baseline and the 6-months assessment were included.

### *Participants*

A total of 1374 new DC members joined the platform during recruitment period of the larger study by Smit et al. (2022). From these, 301 participants completed baseline assessment without deleting their accounts (301/1374; 21.91%), of which 74 participants completed the 6-months assessment as well (74/301; 24.58%). These datasets will be used for inclusion in this study.

### *Survey materials*

#### *Demographic and Clinical Characteristics*

At baseline, participants were asked to indicate their demographic and clinical characteristics, with age, sex, current treatment and depression severity (described below) being recorded in this study. For more detail on the demographic and clinical characteristics of this sample, see Smit et al. (2022).

#### *Depression Severity*

Depression severity was assessed in this study as well, using the Dutch version of the Beck Depression Inventory-II (BDI-II; Beck et al., 1996). This 21-item questionnaire scores answers on a scale from 0 to 3, with a total score ranging from 0 to 63 (higher scores indicating more severe depressive symptoms). The severity of depressive symptoms was considered ‘minimal’ for scores between 0 and 13, ‘mild’ for scores between 14 and 19, ‘moderate to severe’ for scores between 20 and 28, and ‘severe’ for scores between 29 and 63 (von Glischinski et al., 2019). The BDI-II has shown good psychometrics properties (Smit et al., 2022; Wang & Gorenstein, 2013).

#### *Social Support*

Social support was operationalized based on experiential knowledge by summing the scores of the following subscales to one total score per assessment (baseline and 6 months), divided by the number of subscales, creating a score ranging from 0 (low social support) to 4 (high social support): *Seeking support* (i.e., the degree to which the individual seeks and maintains support from professionals and significant others) from the Assessment of Self-

management in Anxiety and Depression questionnaire (ASAD; Krijnen-de Bruin, 2021), the reversed coded subscale of *Getting along* (i.e., amount of ease experienced when interacting with others) from the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0; Üstün et al., 2010), and *Social support* (i.e., the degree of experienced social support), *Connectedness* (i.e., the degree of experienced belonging and fitting in), and *Caring community* (i.e., the degree of experienced acceptance and respect from society) from the Netherlands Empowerment List (NEL; Boevink et al., 2017). The ASAD has shown good validity and reliability (Krijnen-de Bruin et al., 2021) and ranges on a 5-point Likert scale from 0 (*not at all*) to 4 (*very much*). Moreover, the WHODAS 2.0 (Üstün et al., 2010) has been considered as a valid and reliable instrument (Federici et al., 2017) and ranges on a 5-point Likert scale from 0 (*no effort et all*) to 4 (*much effort*). Finally, the NEL (Boevink et al., 2017) showed good internal consistency and validity (Goossens et al., 2017; Boevink et al., 2008; Boevink et al., 2017) as well, with all items in these dimensions being rated on a 5-point Likert scale, ranging from 0 (*strongly disagree*) to 4 (*strongly agree*).

### *Participation*

Participation is operationalized based on experiential knowledge by summing the scores of the following subscales to one total score per assessment (baseline and 6 months), divided by the number of subscales, creating a score ranging from 0 (low participation) to 4 (high participation): *Activities* (i.e., actions of the individual to stay active during the day, like going outside, finding a hobby, creating goals and doing a job) from the Assessment of Self-management in Anxiety and Depression questionnaire (ASAD; Krijnen-de Bruin, 2021), the reversed coded subscale of *Participation* (i.e., experienced amount of ease experienced with joining in community activities) and the reversed coded subscale of *Life activities* (i.e., amount of ease experienced with day-to-day activities, such as work, school, leisure and domestic responsibilities) from the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0; Üstün et al., 2010). As mentioned above, both instruments have shown to be valid and reliable (Krijnen-de Bruin, 2021; Federici et al., 2017), with the ADAS (Krijnen-de Bruin, 2021) ranging from on a 5-point Likert scale from 0 (*not at all*) to 4 (*very much*) and the WHODAS 2.0 (Üstün et al., 2010) ranging from 0 (*no effort et all*) to 4 (*much effort*).

### *User engagement*

In order to determine user engagement, data logs encrypted and provided by the website host of DC were analyzed (De Digitale Poli, 2022). Following, after 3- and 6 months of engagement with the platform, three parameters were computed, making use of metrics most widely utilized to categorize user engagement in *online* health communities (Carron-Arthur et al., 2015; Carron-Arthur et al., 2014). The three computed parameters were: (1) the total time spent, (2) the number of pages viewed, (3) the number of posts published on DC. Sessions during which the surveys were completed were excluded in the parameters.

### *Design and statistical analysis*

The data was analyzed using IBM SPSS Statistics (Version 28). A mixed factor ANOVA was conducted, with the completion of the surveys at two time points (baseline and 6-months) as the first factor (i.e., time; within-subject independent variable) and user engagement profiles as the second factor (between-subject independent variable). The dependent variables were social support, as well as participation. The effect of time on social support and participation was investigated, as well as the interaction effect between time and user engagement on these variables.

### *Data management plan*

All data and data management were handled in accordance with the national guidelines for academic research for behavioral and social sciences (formulated by the Deans of Social Sciences faculties, DSW Committee, 2018). Specifically, data was anonymized (according to GDPR; data was saved and registered with a code) and stored for 15 years, in ownership of Pro Persona, Nijmeegsebaan 61, Nijmegen, the Netherlands.

## **Results**

### *Data preparation*

An a priori power analysis was conducted using G\*Power version 3.1.9.6 (Faul et al., 2007) to determine the minimum sample size required to test the study hypotheses. Results indicated that the required sample size to achieve 80% power for detecting a medium effect, at a significance criterion of  $\alpha = .05$ , was  $N = 42$  for a mixed ANOVA. Of the 301 DC users who participated in the study by completing baseline measurement and providing consent, 74 (24.6%) individuals completed the survey at the 6-month time point as well. After checking the assumptions, one participant (participant number 66) was excluded from the analysis due to outliers. The final sample size for the analysis was 73 DC users, which according to

G\*Power 3.1.9.6 (Faul et al., 2007) yields sufficient power (.97%) and is thereby adequate to test the study hypotheses.

### *User engagement profiles*

From the three parameters (1) the total time spent, (2) the number of pages viewed, (3) the number of posts published on DC, engagement profiles were created by Smit et al. (2022). A K-medoids cluster analysis was performed to identify subgroups sharing similar forum use patterns. For each participant, the above-mentioned three parameters were computed for the first- and last 3 months. Four clusters (i.e., user engagement profiles) were opted from this information by Smit et al. (2022), ranging from (1) *very low*, (2) *low*, (3) *medium*, to (4) *high*. For more details on the analysis, see Smit et al. (2022).

Due to the small number of participants in the high user engagement profile ( $N = 7$ ), the two highest user engagement profiles were taken together as one profile in this study (medium and high, together  $N = 26$ ) to be able to make accurate comparisons.

### *Baseline characteristics of participants*

Demographic and clinical characteristics as well as means and *SDs* for the outcome variables at baseline of the participants are shown in Table 1. The total sample of 73 DC users included participants with a mean age of 53.4 ( $SD = 11.2$ ), and 61.6% (45/73) females. The overall mean baseline BDI score for the total sample was 26.3 ( $SD = 11.5$ ), with around 41.1% of the participants reporting severe depressive symptoms (30/73;  $M = 37.5$ ,  $SD = 5.32$ ), more than one quarter reporting moderate to severe symptoms (24/73, 32.9%;  $M = 23.6$ ,  $SD = 2.7$ ), 16.4% reporting mild symptoms (12/73;  $M = 16.5$ ,  $SD = 1.9$ ) and 9.6% (7/73;  $M = 4.9$ ,  $SD = 5.6$ ) minimal symptoms. Moreover, the overall mean baseline social support score for the total sample was 2.0 ( $SD = .44$ ), and the overall mean baseline participation score was 2.07 ( $SD = .60$ ). Regarding current treatment, 74% of the overall sample received treatment at baseline (54/73).

In total, 33 (45.2%) participants showed very low user engagement, 14 (19.2%) low user engagement, and 26 (35.6%) showed medium to high user engagement. Within these user engagement profiles, the mean baseline BDI score was highest among those with a low user engagement ( $M = 29.8$ ,  $SD = 9.9$ ), with this cluster showing the highest percentage of individuals struggling with severe depressive symptoms (50%). Moreover, the overall mean baseline social support score was highest among those with a medium to high user

engagement profile ( $M = 2.1$ ,  $SD = .5$ ), while the overall mean baseline participation score was highest among those with a low user engagement profile ( $M = 2.2$ ,  $SD = .5$ ).

**Table 1**

*Demographic and Clinical Characteristics of Participants at Baseline*

Baseline characteristics	Very low user engagement ( $N=33$ ; 45.2%)	Low user engagement ( $N=14$ ; 19.2%)	Medium/high user engagement ( $N=26$ ; 35.6%)	Full sample ( $N=73$ )
Female, $n$ (%)	20 (60.6)	6 (42.9)	19 (73.1)	45 (61.6)
Age (years; range: 18-99), mean ( $SD$ )	55.1 (11.1) <sup>a</sup>	55.1 (10.0)	50.4 (11.5)	53.4 (11.2)
Depressive symptoms (BDI-II) <sup>b</sup> , mean ( $SD$ )	25.5 (11.6)	29.8 (9.9)	25.6 (12.2)	26.3 (11.5)
Severity of depressive symptoms (BDI-II II) <sup>c</sup> , $n$ (%)				
Minimal depressive symptoms	4 (12.1)	0 (0)	3 (11.5)	7 (9.6)
Mild depressive symptoms	6 (18.2)	2 (14.3)	4 (15.4)	12 (16.4)
Moderate to severe depressive symptoms	10 (30.3)	5 (35.7)	9 (34.5)	24 (32.9)
Severe depressive symptoms	13 (39.4)	7 (50)	10 (38.5)	30 (41.1)
Current treatment, $n$ (%) <sup>d</sup>	27 (81.8)	8 (57.1)	19 (73.1)	54 (74.0)
Social support, mean ( $SD$ )	2.0 (.4)	1.9 (.4)	2.1 (.5)	2.0 (.4)
Participation, mean ( $SD$ )	2.0 (.6)	2.2 (.5)	2.1 (.6)	2.1 (.6)

*Note.* This table demonstrates the demographic and clinical characteristics of the participants at baseline.

<sup>a</sup> Owing to 1 missing value,  $N = 32$  for this variable.

<sup>b</sup> BDI-II: Beck Depression Inventory-II.

<sup>c</sup> Severity based on the BDI cutoff scores (von Glischinski et al., 2019): 0-13 = minimal depression; 14-19 = mild depression; 20-28 = moderate to severe depression; 29-63 = severe depression.

<sup>d</sup> Including any type of mental health care (e.g., general, specialized or alternative support).

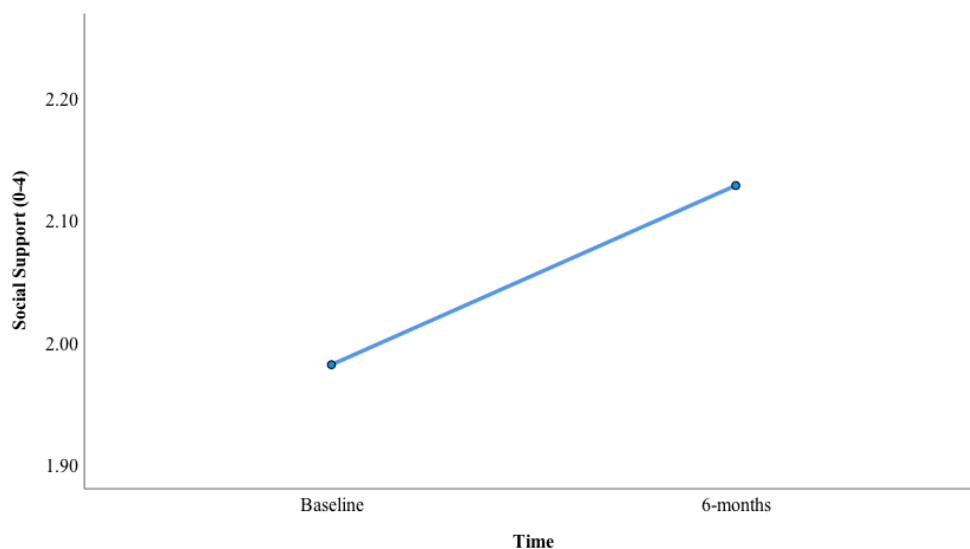
*Outcomes*

There was a significant main effect of time on social support,  $F(1, 70) = 13.318, p < .001, \eta^2 = .160$ . The same holds true for the main effect of time on participation,  $F(1, 70) = 4.851, p < .05, \eta^2 = .065$ . These effects tell us that independently of the engagement of users with DC, social support and participation changed significantly over time. The estimated marginal means to determine the nature of these associations revealed that both social support (baseline:  $M = 2, SE = .06$ ; 6-months:  $M = 2.1, SE = .06$ ) and participation (baseline:  $M = 2.1, SE = .08$ ; 6-months:  $M = 2.2, SE = .07$ ) increased over time. See Figure 1 and Figure 2 for a visualization of these main effects. Moreover, there was a non-significant main effect of user engagement profile on social support,  $F(1,70) = .762, p = .471, \eta^2 = .021$ , and participation,  $F(1, 70) = .451, p = .639, \eta^2 = .013$ . This effect tells us that social support and participation ratings did not significantly differ between user engagement profiles, independent of time.

There was a non-significant interaction between time and user engagement profile on social support,  $F(1,70) = 1.335, p = .270, \eta^2 = .037$ , as well as on participation,  $F(1,70) = 1.974, p = .147, \eta^2 = .053$ . This effect tells us that the change in social support and participation over time did not significantly differ between the three user engagement profiles.

**Figure 1**

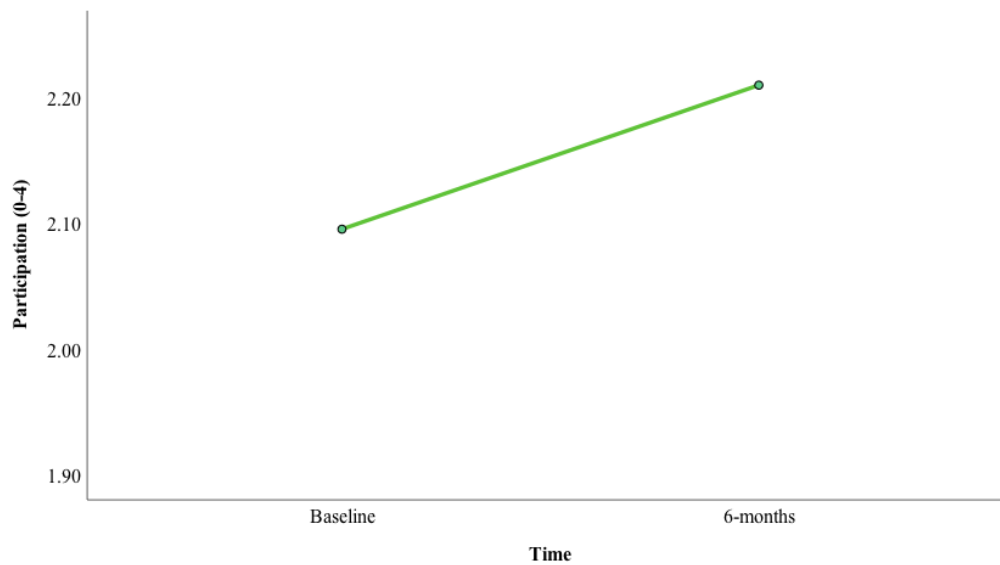
*Increase in Social Support over Time*



*Note.* This figure depicts the increase of social support reported by Depression Connect users from baseline to 6-months assessment.

**Figure 2**

### *Increase in Participation over Time*



*Note.* This figure depicts the increase of participation reported by Depression Connect users from baseline to 6-months assessment.

## **Discussion**

The aim of this study was to investigate whether the recovery-oriented aspects social support and participation in depression are targeted by *online* PSIs, taking into account the role of user engagement. Research thus far has shown a positive relation between *online* PSIs and recovery-oriented categories in depression, while neglecting investigating individual aspects of these categories. To partly fill this gap, this study investigated the effect of an *online* PSI (i.e., Depression Connection; Smit et al., 2021) on two relevant individual aspects of recovery in depression, social support and participation. Moreover, the role of user engagement was taken into account to investigate the most effective manner to use *online* PSIs to achieve optimal benefits. This study was conducted as a way to expand knowledge concerning the potential recovery-oriented benefits of *online* PSIs, identify the most effective manner to use the intervention, increase specificity and possibly identify aspects still left to be stimulated. The hypotheses of this study were as follows: Engagement with the *online* PSI will increase the experience of social support, as well participation, over time. Moreover, higher user engagement with the platform will relate to greater improvements of these aspects over time.

The first hypothesis was confirmed: the experience of social support did increase over time in interaction with the *online* PSI. This might be due to that peer support decreased social isolation (Burke et al., 2019) and/or supplemented *offline* support (Cheng & Vicera, 2022; Smit et al., 2021), thereby increasing the experience of social support. This is beneficial for people struggling with depression as research has shown that social support is highly desired by these people (Smit et al., 2021) and can function as a buffer against detrimental effects of stressful life events on mental health (Windle, 1992) and relapse of depression (Paykel, 1994). In this way, offering peer support and thereby possibly improving the experience of social support might be a way to build resilience and adaptation to depression, in line with the desired recovery paradigm.

The second hypothesis was confirmed as well: participation did increase over time in interaction with the *online* PSI. This might be explained by that peer support functioned as practice to take part in society (again) and/or lower the threshold to do so (Strand et al., 2020; Smit et al., 2021). Increasing participation in individuals struggling with depression is of relevance as it can, beyond mere symptom reduction (Luo et al., 2020; Wang et al., 2022), contribute to a sense of meaning in life (Abuy-Rayya, 2006; Bourassa et al., 2015), thereby fitting the desired recovery paradigm as well. Overall, the data contributes to a clearer understanding of the effects of *online* PSIs on the recovery-oriented aspects social support and participation.

The last and third hypothesis was rejected: higher user engagement with the platform did not relate to greater improvements in the experience of social support nor participation over time. Although there is a significant amount of literature dedicated to finding ways to facilitate user engagement with *online* mental health interventions (e.g., Borghouts et al., 2021; Deng et al., 2023; Tait & Lester, 2005), only little research has investigated the actual effect of user engagement with the intervention on health-related improvements. Some studies show positive effects of high user engagement with *online* communities on health-related improvements (without opting a working mechanism; Auster-Gussman et al., 2022; Costello et al., 2019; Doherty et al., 2012), while no such association has been found for *online* peer support specifically (Smit et al., 2022), in line with the results of the current study. As such, the mechanisms of action of *online* PSIs remain unknown.

The insignificant interaction effect of user engagement is opposed to literature on the positive association between client participation in psychotherapy and improvements as well (Garfield, 1978; Luborsky et al., 1971; Luborsky et al., 1980; Nelson & Borkovec, 1989; Orlinksky & Howard, 1978), which, based on these results, does not generalize to user

engagement with an *online* PSI. This might be explained by the presence of non-specific factors, which might be to a higher degree accountable for the established improvements in social support and participation over time compared to the specific factors of the intervention. Non-specific factors are commonly investigated in psychotherapy efficacy research (Bordin, 1979; Chatoor & Krupnick, 2001; Luborsky et al., 1985), in this context referring to components of a therapy contributing to improvement while not being specified in the theoretical or practical delineation of the treatment (Oei & Shuttlewood, 1996). Examples of such components are therapeutic characteristics (Rogers, 1957), the expectation of improvement as a result of the therapy, hope and motivation for change (Oei & Shuttlewood, 1996). On the other hand, specific factors refer to components of the therapy (i.e., specific techniques and interventions) clearly delineated as the active causes of change (Chatoor & Krupnick, 2001; Oei & Shuttlewood, 1996). Research has shown that non-specific factors of therapy contribute significantly to treatment outcome (Chatoor & Krupnick, 2001). Similarly, non-specific factors of *online* PSIs might be (more) responsible for the improvements in recovery-oriented aspects such as social support and participation as opposed to the specific factors. For instance, the expectation of improvement, the knowledge of a support system to fall back on, hope and motivation for change might be more accountable for the improvements in social support and participation as opposed to the degree of experienced peer support particularly. In this way, the non-specific factors of an *online* PSI will increase the experience of social support and participation irrespectively of the amount of user engagement with the PSI.

Another possible explanation for the insignificant results might be that those with high user engagement offer more support as opposed to receiving it. As mentioned before, the profiles were created based on three parameters: (1) the total time spent, (2) the number of pages viewed, (3) the number of posts published. It was hypothesized that higher user engagement would increase recovery-oriented improvements as it increases received peer support. However, the third parameter, the number of posts published, might not reflect experienced peer support appropriately. Specifically, individuals portraying high user engagement might be those that focused more on helping others and less on their own needs and recovery, thereby predominantly offering peer support as opposed to receiving it. In this way, high user engagement does not contribute to improvements in recovery-oriented aspects.

These results should be interpreted with caution as a number of limitations should be borne in mind. Firstly, a limitation of this study worth mentioning is the lack of a control condition. Without a control condition, it's harder to be certain that the improvements in

social support and participation were actually caused by the *online* PSI and not by other variables (e.g., treatment), thereby affecting the internal validity of this study. Therefore, the conclusions concerning improvements in social support and participation as a result of interaction with the *online* PSI should be interpreted with caution.

Another limitation is the restriction of this study to those users that completed baseline and the 6-months assessment, thereby excluding data from users that completed the 3-months assessment only (after baseline). Due to the complexity of the necessary statistical analysis to include these participants (i.e., multiple linear regression) and the restrictiveness of this paper in educational settings, only those that at least completed baseline and the 6-months assessment were included. The data from users that completed baseline and the 3-months assessment only might hold valuable information concerning the conclusions of this study and therefore future research is recommended to conduct a multiple linear regression with the same research questions including those participants.

Finally, a limitation worth mentioning is the methodological shortcomings in the construction of outcome variables social support and participation. Specifically, these variables were self-constructed by combining subscales from several questionnaires related to the variables, based on shared experiential knowledge. Although the subscales are validated individually, the constructions of the variables have not been validated as a whole (yet). As such, it is uncertain to what extent these constructions are accurate in finding true scores of social support and participation (Kimberlin & Winterstein, 2008). In addition, in the absence of perfect validity, “responsiveness” or “sensitivity to change” should be considered as a psychometric characteristic (Guyat et al., 1989). Responsiveness can be defined as the ability of measures to accurately assess change (Ebesutani et al., 2012), with measures insensitive to change possibly failing to detect true effect of an intervention trial (Kristal et al., 1994). As responsiveness of the constructions in this study has not been proven yet, the constructions might not be sensitive enough to change (e.g., to the influence of user engagement). Therefore, the results should be interpreted with caution.

Further avenues for future research include inventory of possible disadvantages of *online* PSIs for people struggling with depression. As mentioned above, it might be that high user engagers predominantly offer peer support as opposed to receiving it, which might obstruct recovery-oriented improvements as these individuals might get absorbed by other people’s problems and needs or feel responsible for them. To possibly protect these individuals from such distressing experiences, disadvantages of *online* PSIs should be mapped. In addition, further avenues include using well validated and responsive measures

for the outcome variables to examine the accuracy of the results in this study. Furthermore, research is recommended to investigate the effect of *online* PSIs on other individual aspects of recovery, such as confidence and purpose, as a way to increase knowledge concerning the effects of *online* PSIs on building resilience and adaptation to depression.

The current study found that the recovery-oriented aspects social support and participation in depression increased after engagement with an *online* PSI. However, this relation was independent of the amount of user engagement participants displayed. These results expanded our knowledge concerning recovery-oriented benefits of an *online* PSI for people with depression. However, it is still to wait for future research to investigate the effect of *online* PSIs on other individual aspects of recovery, as well as possible disadvantages of the intervention.

## References

- Abuy-Rayya, H. M. (2006). Depression and Social Involvement Among Elders. *The Internet Journal of Health*, 5(1). <https://doi.org/10.5580/1df2>
- Alvarez-Jimenez, M., Gleeson, J. F., Rice, S., Gonzalez-Blanch, C., & Bendall, S. (2016). Online peer-to-peer support in youth mental health: seizing the opportunity. *Epidemiology and Psychiatric Sciences*, 25(2), 123–126. <https://doi.org/10.1017/s2045796015001092>
- American Psychiatric Association (2022). *Diagnostic and statistical manual of mental disorders* (5<sup>th</sup> ed., text rev.). <https://doi.org/10.1176/appi.books.9780890425787>
- Auster-Gussman, L., Lockwood, K. G., Graham, S. A., Pitter, V., & Branch, O. H. (2022). Engagement in Digital Health App-Based Prevention Programs Is Associated With Weight Loss Among Adults Age 65+. *Frontiers in Digital Health*, 4. <https://doi.org/10.3389/fdgth.2022.886783>
- Bains, N., & Abdijadid, S. (2022). *Major Depressive Disorder*. Treasure Island (FL): StatPearls Publishing.
- Beck, A. T., Steer, R. A., & Brown, G. (1996). *Beck Depression Inventory–II (BDI-II)* [Database record]. APA PsycTests. <https://doi.org/10.1037/t00742-000>
- Boevink, W., Kroon, H., & Giesen, F. (2008). *De Nederlandse Empowerment Vragenlijst*. Utrecht: Trimbos-instituut.
- Boevink, W., Kroon, H., Delespaul, P., & Os, J. V. (2017). Empowerment according to Persons with Severe Mental Illness: Development of the Netherlands Empowerment List and Its Psychometric Properties. *Open Journal of Psychiatry*, 07(01), 18–30. <https://doi.org/10.4236/ojpsych.2017.71002>
- Bordin, E. S. (1979). The generalizability of the psychoanalytic concept of the working alliance. *Psychotherapy: Theory, Research & Practice*, 16(3), 252–260. <https://doi.org/10.1037/h0085885>
- Borghouts, J., Eikey, E. V., Mark, G., De Leon, C., Schueller, S. M., Schneider, M., Stadnick, N. A., Zheng, K., Mukamel, D. B., & Sorkin, D. H. (2021). Barriers to and Facilitators of User Engagement With Digital Mental Health Interventions: Systematic Review. *Journal of Medical Internet Research*, 23(3), e24387. <https://doi.org/10.2196/24387>
- Bourassa, K. J., Memel, M., Woolverton, C., & Sbarra, D. A. (2015). Social participation predicts cognitive functioning in aging adults over time: comparisons with physical health, depression, and physical activity. *Aging & Mental Health*, 21(2), 133–146. <https://doi.org/10.1080/13607863.2015.1081152>

- Burke, E., Pyle, M., Machin, K., Varese, F., & Morrison, A. P. (2019). The effects of peer support on empowerment, self-efficacy, and internalized stigma: A narrative synthesis and meta-analysis. *Stigma and Health*, 4(3), 337–356.  
<https://doi.org/10.1037/sah0000148>
- Carron-Arthur, B., Ali, K., Cunningham, J. A., & Griffiths, K. M. (2015). From Help-Seekers to Influential Users: A Systematic Review of Participation Styles in Online Health Communities. *Journal of Medical Internet Research*, 17(12), e271.  
<https://doi.org/10.2196/jmir.4705>
- Carron-Arthur, B., Cunningham, J. A., & Griffiths, K. M. (2014). Describing the distribution of engagement in an Internet support group by post frequency: A comparison of the 90-9-1 Principle and Zipf's Law. *Internet Interventions*, 1(4), 165–168.  
<https://doi.org/10.1016/j.invent.2014.09.003>
- Cavelti, M., Kvrjic, S., Beck, E. M., Rüsçh, N., & Vauth, R. (2012). Self-stigma and its relationship with insight, demoralization, and clinical outcome among people with schizophrenia spectrum disorders. *Comprehensive Psychiatry*, 53(5), 468–479.  
<https://doi.org/10.1016/j.comppsy.2011.08.001>
- Chatoor, I., & Krupnick, J. (2001). The role of non-specific factors in treatment outcome of psychotherapy studies. *European Child & Adolescent Psychiatry*, 10, 19–25.  
<https://doi.org/10.1007/s007870170004>
- Cheng, Q., & Vicera, C. (2022). Online Peer-Support Group's Role in Addressing Filipino Domestic Workers' Social Support Needs: Content and Social Media Metrics Analysis. *International Journal of Environmental Research and Public Health*, 19(15), 9665. <https://doi.org/10.3390/ijerph19159665>
- Committee Scientific Integrity, Data Storage and Reproducibility, Deans of Social Sciences in the Netherlands (2018). Guidelines for the archiving of academic research for faculties of Behavioural and Social Sciences in the Netherlands Version 2.1. *Radboud University*. Retrieved from: [https://www.ru.nl/publish/pages/826378/engels\\_-\\_richtlijn\\_archivering\\_wetenschappelijk\\_onderzoek\\_voor\\_nederlandse\\_faculteiten\\_maatschappij-.pdf](https://www.ru.nl/publish/pages/826378/engels_-_richtlijn_archivering_wetenschappelijk_onderzoek_voor_nederlandse_faculteiten_maatschappij-.pdf) [accessed 2019-09-30]
- Costello, R., Anand, A., Evans, M., & Dixon, W. G. (2019). Associations Between Engagement With an Online Health Community and Changes in Patient Activation and Health Care Utilization: Longitudinal Web-Based Survey. *Journal of Medical Internet Research*, 21(8), e13477. <https://doi.org/10.2196/13477>
- De Digitale Poli. <https://digitalepoli.nl/>. [accessed 2022-10-23]

- Deng, D., Rogers, T., & Naslund, J. A. (2023). The Role of Moderators in Facilitating and Encouraging Peer-to-Peer Support in an Online Mental Health Community: A Qualitative Exploratory Study. *Journal of Technology in Behavioral Science*.  
<https://doi.org/10.1007/s41347-023-00302-9>
- Dennis, C. L. (2003). Peer support within a health care context: a concept analysis. *International Journal of Nursing Studies*, 40(3), 321–332.  
[https://doi.org/10.1016/s0020-7489\(02\)00092-5](https://doi.org/10.1016/s0020-7489(02)00092-5)
- Doherty, G., Coyle, D., & Sharry, J. (2012). Engagement with Online Mental Health Interventions: An Exploratory Clinical Study of a Treatment for Depression. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. Association for Computing Machinery, 1421–1430.  
<https://doi.org/10.1145/2207676.2208602>
- Ebesutani, C., Drescher, C. F., Reise, S. P., Heiden, L., Hight, T. L., Damon, J. D., & Young, J. (2012). The Loneliness Questionnaire–short version: An evaluation of reverse-worded and non-reverse-worded items via item response theory. *Journal of Personality Assessment*, 94(4), 427–437.  
<https://doi.org/10.1080/00223891.2012.662188>
- Farkas, M., & Anthony, W. A. (2010). Psychiatric rehabilitation interventions: A review. *International Review of Psychiatry*, 22(2), 114–129.  
<https://doi.org/10.3109/09540261003730372>
- Faul, F., Erdfelder, E., Lang, A.G. and Buchner, A. (2007). G\*Power 3: A Flexible Statistical Power Analysis Program for the Social, Behavioral, and Biomedical Sciences. *Behavior Research Methods*, 39, 175-191. <http://dx.doi.org/10.3758/BF03193146>
- Federici, S., Bracalenti, M., Meloni, F., & Luciano, J. V. (2017). World Health Organization disability assessment schedule 2.0: An international systematic review. *Disability and Rehabilitation*, 39(23), 2347–2380. <https://doi.org/10.1080/09638288.2016.1223177>
- Fiske, A., Wetherell, J. L., & Gatz, M. (2009). Depression in Older Adults. *Annual Review of Clinical Psychology*, 5(1), 363–389.  
<https://doi.org/10.1146/annurev.clinpsy.032408.153621>
- Friedrich, M. (2017). Depression Is the Leading Cause of Disability Around the World. *JAMA*, 317(15), 1517. <https://doi.org/10.1001/jama.2017.3826>
- Garfield, S. L. (1978). Research on client variables in psychotherapy. In S. L. Garfield and A. E. Bergin (Eds.), *Handbook of Psychotherapy and Behavior Change*, 2nd ed. New York: John Wiley.

- Goossens, P. J. J., Beentjes, T. A. A., Knol, S., Salyers, M. P., & de Vries, S. J. (2017). Investigating the reliability and validity of the Dutch versions of the illness management and recovery scales among clients with mental disorders. *Journal of Mental Health, 26*(6), 489–495. <https://doi.org/10.3109/09638237.2015.1124398>
- Greenberg, P. E., Fournier, A. A., Sisitsky, T., Simes, M., Berman, R., Koenigsberg, S. H., & Kessler, R. C. (2021). The Economic Burden of Adults with Major Depressive Disorder in the United States (2010 and 2018). *Pharmacoeconomics, 39*(6), 653–665. <https://doi.org/10.1007/s40273-021-01019-4>
- Griffiths, K. M., Calear, A. L., & Banfield, M. (2009). Systematic Review on Internet Support Groups (ISGs) and Depression (1): Do ISGs Reduce Depressive Symptoms? *Journal of Medical Internet Research, 11*(3), e40. <https://doi.org/10.2196/jmir.1270>
- Guyatt, G. H., Mitchell, A., Irvine, E. J., Singer, J., Williams, N. I., Goodacre, R., & Tompkins, C. (1989). A New Measure of Health Status for Clinical Trials in Inflammatory Bowel Disease. *Gastroenterology, 96*(2), 804–810. [https://doi.org/10.1016/s0016-5085\(89\)80080-0](https://doi.org/10.1016/s0016-5085(89)80080-0)
- Harvey, P. D., & Bellack, A. S. (2009). Toward a Terminology for Functional Recovery in Schizophrenia: Is Functional Remission a Viable Concept? *Schizophrenia Bulletin, 35*(2), 300–306. <https://doi.org/10.1093/schbul/sbn171>
- Hawton, K., Casañas i Comabella, C., Haw, C., & Saunders, K. (2013). Risk factors for suicide in individuals with depression: A systematic review. *Journal of Affective Disorders, 147*(1–3), 17–28. <https://doi.org/10.1016/j.jad.2013.01.004>
- Huang, R., Yan, C., Tian, Y., Lei, B., Yang, D., Liu, D. & Lei, J. (2020). Effectiveness of peer support intervention on perinatal depression: A systematic review and meta-analysis. *Journal of Affective Disorders, 276*, 788–796. <https://doi.org/10.1016/j.jad.2020.06.048>
- IBM Corp. (2021). *IBM SPSS Statistics for Windows (Version 28.0)*. [Computer software]. Armonk, NY: IBM Corp
- Jacob, K. S. (2012). Depression: a major public health problem in need of a multi-sectoral response. *Indian Journal of Medical Research, 136*(4), 537-539. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3516018/>
- Kimberlin, C. L., & Winterstein, A. G. (2008). Validity and reliability of measurement instruments used in research. *American Journal of Health-system Pharmacy, 65*(23), 2276–2284. <https://doi.org/10.2146/ajhp070364>

- Krijnen-de Bruin, E. K., Draisma, S., Muntingh, A. D. T., Evers, A., Van Straten, A., Sinnema, H., Spijker, J., Batelaan, N. M., & Van Meijel, B. (2021). Self-Management in Anxiety and Depression: A Psychometric Evaluation of a Questionnaire. *Frontiers in Psychology, 12*. <https://doi.org/10.3389/fpsyg.2021.694583>
- Kristal, A. R., Beresford, S. A., & Lazovich, D. (1994). Assessing change in diet-intervention research. *The American Journal of Clinical Nutrition, 59*(1), 185S-189S. <https://doi.org/10.1093/ajcn/59.1.185s>
- Leamy, M., Bird, V., Boutillier, C. L., Williams, J., & Slade, M. (2011). Conceptual framework for personal recovery in mental health: systematic review and narrative synthesis. *British Journal of Psychiatry, 199*(6), 445–452. <https://doi.org/10.1192/bjp.bp.110.083733>
- Luborsky, L., Auerbach, A. H., Chandler, M., Cohen, J., & Bachrach, H. M. (1971). Factors influencing the outcome of psychotherapy: A review of quantitative research. *Psychological Bulletin, 75*(3), 145–185. <https://doi.org/10.1037/h0030480>
- Luborsky, L., McLellan, A. T., Woody, G. E., O'Brien, C. P., & Auerbach, A. H. (1985). Therapist Success and Its Determinants. *Archives of General Psychiatry, 42*(6), 602. <https://doi.org/10.1001/archpsyc.1985.01790290084010>
- Luborsky, L., Mintz, J., Auerbach, A. H., Christoph, P., Bachrach, H., Todd, T. R., Manco-Johnson, M. J., Cohen, M. G., & O'Brien, C. P. (1980). Predicting the Outcome of Psychotherapy. *Archives of General Psychiatry, 37*(4), 471. <https://doi.org/10.1001/archpsyc.1980.01780170113014>
- Luo, M., Ding, D., Bauman, A., Negin, J., & Phongsavan, P. (2020). Social engagement pattern, health behaviors and subjective well-being of older adults: an international perspective using WHO-SAGE survey data. *BMC Public Health, 20*(1). <https://doi.org/10.1186/s12889-019-7841-7>
- Munce, S. E. P., Shepherd, J., Perrier, L., Allin, S., Sweet, S. N., Tomasone, J. R., Nelson, M. L. A., Guilcher, S. J. T., Hossain, S. & Jaglal, S. (2017). Online peer support interventions for chronic conditions: a scoping review protocol. *BMJ Open, 7*(9), e017999. <https://doi.org/10.1136/bmjopen-2017-017999>
- Nelson, R. A., & Borkovec, T. D. (1989). Relationship of client participation to psychotherapy. *Journal of Behavior Therapy and Experimental Psychiatry, 20*(2), 155–162. [https://doi.org/10.1016/0005-7916\(89\)90048-7](https://doi.org/10.1016/0005-7916(89)90048-7)

- Oei, T. P. S., & Shuttlewood, G. J. (1996). Specific and nonspecific factors in psychotherapy: A case of cognitive therapy for depression. *Clinical Psychology Review, 16*(2), 83–103. [https://doi.org/10.1016/0272-7358\(96\)00009-8](https://doi.org/10.1016/0272-7358(96)00009-8)
- Orlinsky, D. E., & Howard, K. I. (1978). The relation of process to outcome in psychotherapy. In S. L. Garfield & A. E. Bergin (Eds.), *Handbook of psychotherapy and behavior change* (2nd ed., (pp. 283–329). New York: Wiley
- Park, H. Y., Kim, M. J., Kim, J. Y., Kim, S., Choi, J. Y., Kim, J. H., & Jeong, H. Y. (2018). Could Peer Support Programs Be a Good Resource for Managing the Unmet Needs of Cancer Patients? *Journal of Cancer Education, 34*(5), 950–957. <https://doi.org/10.1007/s13187-018-1399-4>
- Paykel, E. S. (1994). Life events, social support and depression. *Acta Psychiatrica Scandinavica, 89*(377, Suppl), 50–58. <https://doi.org/10.1111/j.1600-0447.1994.tb05803.x>
- Piat, M., Wainwright, M., Sofouli, E., Vachon, B., Deslauriers, T., Préfontaine, C., & Frati, F. (2021). Factors influencing the implementation of mental health recovery into services: a systematic mixed studies review. *Systematic Reviews, 10*(1). <https://doi.org/10.1186/s13643-021-01646-0>
- Robinson, D. G., Woerner, M. G., McMeniman, M., Mendelowitz, A., & Bilder, R. M. (2004). Symptomatic and Functional Recovery From a First Episode of Schizophrenia or Schizoaffective Disorder. *American Journal of Psychiatry, 161*(3), 473–479. <https://doi.org/10.1176/appi.ajp.161.3.473>
- Rogers, C. R. (1957). The necessary and sufficient conditions of therapeutic personality change. *Journal of Consulting Psychology, 21*(2), 95–103. <https://doi.org/10.1037/h0045357>
- Smit, D., Peelen, J., Vrijisen, J. N., & Spijker, J. (2020). An exploration of the conditions for deploying self-management strategies: a qualitative study of experiential knowledge in depression. *BMC Psychiatry, 20*(1). <https://doi.org/10.1186/s12888-020-02559-3>
- Smit, D., Vrijisen, J. N., Broekman, T., Groeneweg, B., & Spijker, J. (2022). User Engagement Within an Online Peer Support Community (Depression Connect) and Recovery-Related Changes in Empowerment: Longitudinal User Survey. *JMIR Formative Research, 6*(11), e39912. <https://doi.org/10.2196/39912>
- Smit, D., Vrijisen, J. N., Groeneweg, B., Vellinga-Dings, A., Peelen, J., & Spijker, J. (2021). A Newly Developed Online Peer Support Community for Depression (Depression

- Connect): Qualitative Study. *Journal of Medical Internet Research*, 23(7), e25917.  
<https://doi.org/10.2196/25917>
- Strand, M., Eng, L. S., & Gammon, D. (2020). Combining online and offline peer support groups in community mental health care settings: a qualitative study of service users' experiences. *International Journal of Mental Health Systems*, 14(1).  
<https://doi.org/10.1186/s13033-020-00370-x>
- Tait, L., & Lester, H. (2005). Encouraging user involvement in mental health services. *Advances in Psychiatric Treatment*, 11(3), 168–175.  
<https://doi.org/10.1192/apt.11.3.168>
- Taylor, S. E. (2011). Social support: A review. In H. S. Friedman (Ed.), *The Oxford handbook of health psychology* (pp. 189–214). Oxford University Press.
- Üstün, T. B., Kostanjsek, N., Chatterji, S. & Rehm, J. (2010). Measuring health and disability : manual for WHO Disability Assessment Schedule : WHODAS 2.0. *Measuring health and disability: manual for WHO Disability Assessment Schedule (WHODAS 2.0)*. Retrieved from  
[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjn0cLH4oj8AhUvg\\_0HHXkVCVYQFnoECAkQAQ&url=https%3A%2F%2Fapps.who.int%2Firis%2Frest%2Fbitstreams%2F52276%2Fretrieve&usg=AOvVaw3qrSlJMSUsbiwVvkukF0Ty](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKewjn0cLH4oj8AhUvg_0HHXkVCVYQFnoECAkQAQ&url=https%3A%2F%2Fapps.who.int%2Firis%2Frest%2Fbitstreams%2F52276%2Fretrieve&usg=AOvVaw3qrSlJMSUsbiwVvkukF0Ty)
- Vayshenker, B., Mulay, A. L., Gonzales, L., West, M. L., Brown, I., & Yanos, P. T. (2016). Participation in peer support services and outcomes related to recovery. *Psychiatric Rehabilitation Journal*, 39(3), 274–281. <https://doi.org/10.1037/prj0000178>
- Von Glischinski, M., Von Brachel, R., & Hirschfeld, G. (2019). How depressed is “depressed”? A systematic review and diagnostic meta-analysis of optimal cut points for the Beck Depression Inventory revised (BDI-II). *Quality of Life Research*, 28(5), 1111–1118. <https://doi.org/10.1007/s11136-018-2050-x>
- Wang, J., Xu, J., Nie, Y., Pan, P., Zhang, X., Li, Y., Liu, H., Liang, L., Gao, L., Wu, Q., Hao, Y., & Shah, S. (2022). Effects of Social Participation and Its Diversity, Frequency, and Type on Depression in Middle-Aged and Older Persons: Evidence From China. *Frontiers in Psychiatry*, 13. <https://doi.org/10.3389/fpsy.2022.825460>
- Wang, Y., & Gorenstein, C. (2013). Psychometric properties of the Beck Depression Inventory-II: a comprehensive review. *Revista Brasileira De Psiquiatria*, 35(4), 416–431. <https://doi.org/10.1590/1516-4446-2012-1048>

- Weeghel, J van., Zelst, C van., Boertien, D., & Hasson-Ohayon, I. (2019). Conceptualizations, assessments, and implications of personal recovery in mental illness: A scoping review of systematic reviews and meta-analyses. *Psychiatric Rehabilitation Journal*, 42(2), 169–181. <https://doi.org/10.1037/prj0000356>
- Windle, M. (1992). A longitudinal study of stress buffering for adolescent problem behaviors. *Developmental Psychology*, 28(3), 522–530. <https://doi.org/10.1037/0012-1649.28.3.522>
- Winsper, C., Crawford-Docherty, A., Weich, S., Fenton, S. J., & Singh, S. P. (2020). How do recovery-oriented interventions contribute to personal mental health recovery? A systematic review and logic model. *Clinical Psychology Review*, 76, 101815. <https://doi.org/10.1016/j.cpr.2020.101815>
- Wood, J. V. (1996). What is social comparison and how should we study it? *Personality and Social Psychology Bulletin*, 22(5), 520–537. <https://doi.org/10.1177/0146167296225009>
- World Health Organization. (2001). *International classification of functioning, disability and health (ICF)*. Geneva, World Health Organization.
- World Health Organization. (2021, Sept, 13). *Depression*. WHO <https://www.who.int/news-room/fact-sheets/detail/depression>
- Wright, K. B., Bell, S. B., Wright, K. B., & Bell, S. B. (2003). Health-related Support Groups on the Internet: Linking Empirical Findings to Social Support and Computer-mediated Communication Theory. *Journal of Health Psychology*, 8(1), 39–54. <https://doi.org/10.1177/1359105303008001429>