

The Effects of a Meaning Intervention on Depressive Symptoms

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Abstract

Recent literature suggests that interventions focused on meaning in life (MiL) might be an effective method to reduce depressive symptoms. Most studies that have been done on this topic used a clinical sample to which they administered multiple sessions of a face-to-face meaning intervention. In this study, we want to examine whether a 50-minute online meaning in life intervention might also be effective in reducing depressive symptoms over a one week period in a non-clinical sample. Next to this, we want to explore whether working on a relationship-related goal might be beneficial for reducing depressive symptoms and increasing levels of MiL. To test this, 97 students at the University of Groningen took part in our study and were randomly allocated to either I) the meaning-intervention group or II) a control group and were measured on their perceived MiL, depressive symptoms and their relationship-related goal pursuit at baseline and after a one week-follow-up. The results showed that compared to the control, the meaning-intervention group reported significantly increased levels of experienced MiL at the one week follow-up. However, there were no significant differences between the two groups regarding their levels of depressive symptoms. Furthermore, their relationship-related goal pursuits did not seem to be beneficial for reducing depressive symptoms or increasing levels of MiL.

The Effects of a Meaning Intervention on Symptoms of Depression

Globally, approximately 280 million people suffer from depression. This is nearly 4% of the entire world's population (WHO, 2023). These staggering figures highlight depression as the most prevalent mental disorder and underscore the urgent need to address it, seeking methods to treat and prevent it. Depression is a mood disorder characterized by "severe symptoms that affect how a person feels, thinks, and handles daily activities, such as sleeping, eating, or working" (NIH, 2023). Consequently, depression significantly impacts everyday life and should not be taken lightly.

A common symptom among individuals with depressive symptoms is the perception that life is less meaningful (Remmers et al., 2023). Moreover, individuals who perceive their life as more meaningful generally report lower levels of depressive symptoms (Dewitte et al., 2022, Fischer et al., 2023). In extreme cases, this loss of perceived meaning might even lead to suicide, as evidenced by a national survey by Meier et al. (1998) where physicians reported that approximately 47 percent of requests for assisted suicide were believed to stem from the patient's perceived loss of meaning in life. On the contrary, research has shown that having a strong sense of meaning in one's life can act as a protective factor against suicide, as it mediates the relationship between depressive symptoms and suicidal ideation (Rodríguez et al., 2024). In conclusion, it is evident that meaning in life is a crucial factor to be considered when talking about depressive symptoms in psychological research. To deepen our comprehension of the relationship between meaning in life and depression, it is essential to initially define and operationalize the concept of meaning. The upcoming sections will explore the psychological research on 'meaning in life' and analyze its key components.

Meaning in Life

In psychological science, meaning in life (MiL) is often described as a three dimensional construct. This construct consists of the components: coherence, significance,

and purpose (Martela & Steger, 2016). In this definition, the concept of coherence describes the degree to which life events subjectively make sense to the individual and to which life itself seems to be comprehensible. The element of significance pertains to how much one perceives their life as being meaningful, that is believing that their life has an inherent value and that it is worth living. The element of purpose has often been used interchangeably with the concept of MiL itself (George and Park, 2013). As an attempt to distinguish the two constructs, George and Park (2013) define purpose as “a sense of core goals, direction in life, and enthusiasm regarding the future” (p.371).

Each of these three sub-elements of MiL are likely to be inversely related with depression. For instance, coherence should lead to fewer depressive feelings by providing a clear understanding of life, thereby making the future appear more predictable. Individuals suffering from depression often exhibit a high intolerance for uncertainty about their future (Andrews et al., 2023). An increased sense of coherence typically alleviates these uncertainties, allowing individuals to feel more in control and less overwhelmed (Kieraité et al., 2024). This, in turn, could result in lower depressive symptoms. Recent research supports this, demonstrating that a stronger sense of coherence is associated with lower levels of depressive symptoms (Kieraité et al., 2024; Schäfer et al., 2023). Similarly, a heightened sense of significance is associated with a lower likelihood of experiencing depressive symptoms. People who experience depressive symptoms often report feelings of insignificance or unimportance to those around them. In contrast, an increased sense of significance is inversely correlated with depression (Krygsman et al., 2021). Furthermore, purpose is anticipated to be inversely correlated with depression by reducing avoidance tendencies and motivating individuals to actively pursue meaningful goals. Individuals experiencing depressive symptoms often exhibit avoidance behaviors, opting to avoid potential negative consequences rather than actively striving towards their desired goals

(Boreham & Schutte, 2023). Recent research supports this association, as evidenced by a meta-analysis of 99 studies by Boreham and Schutte (2023), which demonstrated that individuals with a strong sense of purpose report significantly lower levels of depression and limited avoidance tendencies. Conversely, individuals who set and pursue approach goals tend to experience significantly lower levels of depression and negative affect (Trew, 2011).

Sheldon and Elliot (1999) explain this effect through the self-concordance model, which suggests that it is beneficial for individuals to choose goals aligned with their personal values and interests. These self-concordant goals are driven by intrinsic motivation rather than external factors or societal expectations. People are more likely to invest effort in such goals, and achieving them can greatly enhance their well-being. This study applies this theory to encourage participants to actively pursue goals that hold intrinsic value for them, with the aim of reducing symptoms of depression and increasing MiL. A particular focus of our exploration is the pursuit of goals related to relationships, which research identifies as a significant source of meaning and well-being.

Interpersonal Relationships as a source of MiL

Interpersonal Relationships serve as a primary source of MiL across various cultures (Glaw et al., 2016). Particularly noteworthy is the significance of family relationships, which serve as a crucial source of meaning for young adults aged 18 to 27 (Lambert et al., 2010). These relationships contribute not only to a sense of MiL but also to an understanding of the world and a feeling of security. Consequently, they are closely connected with the MiL subscale of coherence, which helps us make sense of our surroundings and predict our future (Kieraité et al., 2024).

In addition to coherence, interpersonal relationships are crucial for fostering a sense of significance in life. Studies indicate that positive social interactions can enhance the perception that one's life is meaningful and matters to others (Krygsman et al., 2022). This

holds true for older adults too, as greater perceived social support correlates with higher levels of MiL (Krause, 2007). Conversely, negative interpersonal interactions are associated with feelings of reduced mattering to others (Krygsman et al., 2021).

Research has shown that a higher sense of purpose is linked to better relationships, including more adaptive parent-child dynamics (Hill et al., 2016). This positive association is not limited to family relationships but extends to romantic relationships as well. A significant positive correlation has been found between a sense of purpose and perceived relationship quality, as well as commitment to the partner (Pfund et al., 2020). One possible explanation for this is that higher levels of purpose may promote or be promoted by relationship-oriented behaviors.

In summary, all three sub-elements of MiL are positively related to the quality of interpersonal relationships. Therefore, we hypothesize that encouraging participants to pursue relationship-related goals would also be associated with higher levels of MiL and lower levels of depressive symptoms.

Interpersonal Relationships and Depression

There is a strong inverse link between the quality of interpersonal relationships and symptoms of depression (Eberhart and Hammen, 2000; Kieraitė et al., 2024; Zlotnick et al., 2000). Generally, poor interpersonal relationships have been associated with adverse health effects, including depression. Specifically, difficulties in intimate relationships are frequently observed in individuals with major depressive disorder (Zlotnick et al., 2000). To explore this relationship further, Eberhart and Hammen (2000) conducted a longitudinal study involving 109 young women from an L.A. high school. Over six months, they assessed the participants' relationship quality with peers and family and monitored subsequent depressive symptoms. The results showed that not only does poor relationship quality correlate with depressive symptoms, but it can also forecast the severity of these symptoms in the future among

participants. In contrast, positive relationship quality has been consistently associated with improved well-being (Kieraitė et al., 2024). One plausible explanation for this finding is that relationships provide social support, which serves as a buffer against stressors, thus mitigating their effects and reducing the likelihood of developing depressive symptoms (Raffaelli, 2012). Therefore, efforts to enhance relationship quality can have a positive impact on both mental and physical health (Canevello & Crocker, 2011). Another explanation for the benefit of having strong interpersonal relationships might be their contribution to a heightened sense of MiL. Given the established links between relationship quality, MiL, and depression, we expect that working on interpersonal relationships would be associated with an increase in MiL and a decrease in depressive symptoms.

Past Research on MiL and Depression

Empirical research on the relationship between MiL and depression has predominantly been correlational. Nonetheless, these studies consistently demonstrate a strong inverse relationship between MiL and symptoms of depression (Dewitte et al., 2022; Marco et al., 2024). In a longitudinal study conducted by Dewitte et al. (2022), a clinical sample of 140 Alzheimer's patients was tracked over three years, with annual assessments of depressive symptoms. The findings indicated that participants with higher levels of MiL reported lower levels of depressive symptoms after one year compared to those with lower MiL levels. Additionally, Dewitte and Dezutter (2021) conducted a correlational study involving a non-clinical sample of older adults aged above 75. The results demonstrated that individuals who contemplate MiL typically report higher levels of MiL and overall well-being, whereas those who show less interest in this aspect tend to report lower MiL levels and higher symptoms of depression.

Previous experimental studies have mainly focused on meaning interventions aimed at alleviating depressive symptoms among clinical populations, particularly cancer patients

(Marco et al., 2024). One typical form of meaning interventions that are used in cancer patients are meaning centered psychotherapies (MCP). These therapies are specifically tailored and appear to be successful in enhancing cancer patients' sense of MiL, thereby giving them an increased feeling of hope and meaning in the face of death (Dietrich et al., 2021). Next to this, MCP seems to be as effective as a cognitive-behavioral therapy in reducing depressive symptoms of cancer patients and even more effective in increasing the patients perceived MiL (Marco et al., 2024). There has been relatively less exploration of MCP interventions among non-cancer patient groups. In one recent publication, Marco et al. (2023) conducted a meta-analysis in which they investigated the effectiveness of MCP in a clinical sample of non-cancer patients with depression. In their analysis, the authors systematically reviewed six studies that applied MCP to individuals with depression. The findings suggest that MCP might be a promising effective treatment for lowering depressive symptoms. A common characteristic of these interventions is that they are typically delivered face-to-face, involve multiple sessions, and are targeted at clinical settings. A recent study by van Doornik et al. (2024) adapted this form of MCP to specifically address a non-clinical sample of undergraduate female students with heightened concerns about shape and weight. In their study, participants received six weekly individual sessions of the adapted MCP. The findings demonstrated that their tailored meaning intervention was not only successful in increasing MiL but also significantly reduced both eating-disordered symptoms and symptoms of depression. Our study aims to investigate whether a single MiL intervention could yield similar results. Moreover, it seeks to determine if an intervention delivered solely through internet-based video, audio, and self-reflection exercises is enough to reduce depressive symptoms. Computerized cognitive behavioral therapies for individuals with depression have been shown to be an effective treatment method, with effectiveness comparable to face-to-face cognitive behavioral therapy (Andrews et al., 2010). Furthermore,

online interventions have been shown to be effective for non-clinical samples experiencing lower levels of depressive symptoms (Reins et al., 2020). Supporting the potential of online interventions, an experimental study by Ostafin and Proulx (2023) explored the efficacy of a brief, online meaning intervention in mitigating adverse psychological outcomes of stressful events, such as anxiety and rumination. The study was conducted with a non-clinical sample of Dutch undergraduate students, who were exposed to an aversive film known to induce trauma-related stressors. The findings indicated that the brief online meaning intervention was effective in reducing feelings of anxiety and rumination among the participants.

Current study

Based on existing literature, higher levels of MiL are associated with increased well-being, better interpersonal relationships, and reduced depressive symptoms (Dewitte et al., 2022; Marco et al., 2024; Kieraité et al., 2024; Krygsman et al., 2022; Schäfer et al., 2023). However, the precise mechanisms behind these connections remain unclear. Previous research has primarily focused on clinical populations, with experimental studies typically conducted over extended periods and in face-to-face settings. Recent findings have shown promising effects of meaning interventions administered online (Ostafin and Proulx, 2023) and to subclinical samples (Van Doornik et al., 2024).

Our study aimed to extend this research by investigating the impact of a short, online MiL intervention on perceived MiL and depressive symptoms in a non-clinical sample. More specifically, our research empirically tested the hypothesis that (H1) the meaning-intervention group will report fewer depressive symptoms at a one week follow-up questionnaire compared to the control group. Next to this, we wanted to build on the importance of intrinsic goals and relationships in MiL and depression. Therefore, we explored whether working on an intrinsic goal that is relationship-related would be beneficial in decreasing depressive symptoms and increasing MiL. Specifically, we investigated the

following exploratory research questions: “Is there a relation between working towards relationship-related goals and reductions in depression?” and “Is there a relation between working towards relationship-related goals and an increase in MiL?” This study was approved by the Ethical Committee of Psychology at the University of Groningen.

Methods

Participants

The participants were mostly students at the University of Groningen, who either participated for a monetary reward or for credits of a first year ‘international business’ course. A total of 132 participants were recruited, who represented a range of nationalities, namely Dutch (35%), Indonesian (16%), German (8%), and others (41%). We initially aimed for a sample of 150 participants, but the data collection period ended before we could reach the pre registered sample size.

We excluded participants that did not meet our selection criteria (self-report of at least a ‘moderate’ fluency in the English language; $n = 2$), and those who did not complete the follow-up questionnaire ($n = 33$). After this exclusion, a final sample of 97 subjects remained (58 female, 39 male, $M_{age}=20.41$ $SD= 2.7$). This sample allowed for a power of 0.16 to detect a main effect size of 0.1, a power of 0.67 to detect an effect size of 0.25 and a power of 0.97 to detect an effect size of 0.4, which are small, medium and large effect sizes, respectively.

Measures and Materials

Manipulation Check - Meaning in Life

Meaning-in-life (MiL) was measured using questions of the three-dimensional meaning in life questionnaire by Martela & Steger (2023). This questionnaire consists of 11 questions assessing the participant’s perceived MiL over the last week through the

components of significance (e.g. ‘my personal existence is significant’), purpose (e.g. ‘i am highly committed to certain core goals in my life’), and coherence (e.g. ‘most things happening in my life do make sense’). Participants were asked to rate these statements about themselves using a 7-point scale ranging from ‘absolutely untrue’ to ‘absolutely true’.

This questionnaire demonstrated a Cronbach’s alpha of 0.932 at the baseline and 0.945 at the follow up.

Depressive Symptoms

Depressive symptoms were measured using the Depression Anxiety Stress Scales (DASS-21). From this tool, only the seven items that were designed to specifically assess symptoms of depression were used (e.g. ‘I felt down-hearted and blue’, ‘I felt that life was meaningless’). Participants were asked to rate the degree to which they related to these statements over the past week on a 4-point scale (0 = *did not apply to me at all*, 3 = *applied to me very much or most of the time*). This questionnaire demonstrated a Cronbach’s alpha of 0.887 at the baseline and 0.837 at the follow-up.

Relationship-Related Goal Pursuit

At the end of the MiL-intervention, participants were asked to indicate an intrinsically motivated goal aligned with their core values that they aimed to pursue over the following week, up until the follow-up questionnaire. These goals were then coded by the research assistants into two categories: relationship-related or not relationship-related. Goals related to relationships were coded as 1, while those unrelated to relationships were coded as 0. To test whether the participants actively pursued their relationship-related goals, we implemented a question stating “How much effort have you put into your close relationships over the past 1 week?” in the follow-up. Participants could rate their effort on a scale reaching from 0 to 100 (0 = *no effort at all*, 100 = *very much effort*).

Conditions

We designed a 50-minute meaning-in-life intervention in which participants are guided through meaning exercises, incorporating both video and audio components aimed at enhancing bodily awareness and reflection on core values. Initially, participants were directed to watch a video featuring Steve Jobs delivering a motivational speech to Stanford graduate students in 2005, emphasizing the significance of leading an authentic life aligned with one's own personal values. To ensure that participants watched the video, they were asked to describe what they had seen in the video in a follow-up question. Then, participants were informed about the importance of living authentically, that is, to live according to their own deepest values. After this, the meaning intervention exercise was introduced to them as an exercise designed for relaxation, exploring core values and choosing intrinsically important goals. Before listening to the audio, participants were presented with a list of common core values (see appendix A). Following contemplation of personal values, participants proceeded to the central component of the intervention - a 17-minute focusing exercise created by the primary researcher, Dr. Brian Ostafin. This audio guided participants to focus inward, attend to bodily sensations, and reevaluate their core values. A 17-minute timer was implemented to ensure participants dedicated sufficient time to the exercise. After participants completed this audio, they were instructed to think about and report a goal that they could set for themselves over the next week which lies in line with one of their core values.

In the control condition, participants were presented with the same initial questionnaires as the experimental condition. However, instead of the video and audio components that were presented to the MiL condition, the control condition filled out unrelated personality questions assessing the Big-five personality traits.

Procedure

First year international business students from the University of Groningen were offered course credit in exchange for participating in this study. Additionally, other students

could participate in the study for a monetary reward of 10 euros. Participants were asked to come to the university's business lab to take part in the study. The data was collected by two third-year psychology students and the lab manager. Upon entering the lab, participants were asked to read and sign a consent form before beginning the research. Furthermore, they were instructed to turn off their phones to prevent any distractions. They were then assigned to one of eight isolated cubicles, each equipped with a computer for the study. When starting the study, they were randomly allocated to either the experimental or the control condition by the qualtrics program. After completing the study, participants were reminded to fill out the follow-up questionnaire, which they would receive a week later.

Data Analyses

Firstly, a screening for depressive symptoms took place. For this, the *Patient Health Questionnaire-2* was used. This screening tool consisted of asking participants to rate the severity of the following two items over the last two weeks 'little interest or pleasure in doing things' and 'feeling down, depressed or hopeless' on a 4-point scale (0 = *not at all*, 3 = *nearly every day*). To be included in the analysis, participants needed to score at least '1' on either item. All participants met this criterion. After confirming this requirement, the data were analyzed using JASP, with a final sample of 97 participants: 48 in the meaning intervention group and 49 in the control condition. Specifically, a repeated measurements of a univariate Analysis of Variance (RM-ANOVA) was conducted for the manipulation check to see whether the MiL intervention was effective in significantly increasing MiL in participants of the experimental condition. For Hypothesis 1, a RM-ANOVA was used with the condition (experimental vs. control) as the between-subject variable and the mean depressive symptoms of students as the within-subject variable at baseline and follow-up. For the exploratory hypotheses examining relationship-related goal pursuit and its relation to depressive symptoms and MiL, two correlation analyses were conducted. Specifically, we examined the

correlation between the coded goals of participants and their changes in depressive symptoms and MiL (baseline minus follow-up).

Results

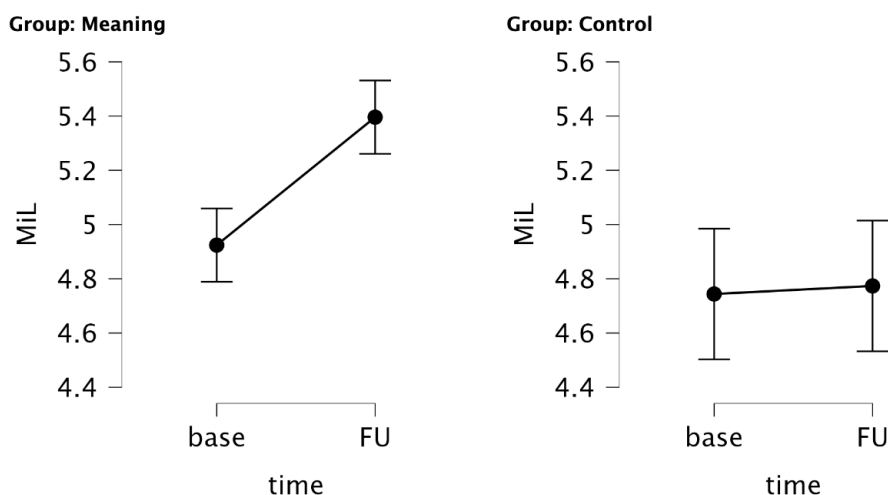
For H1, the assumption checks showed that the MiL reports of both groups at baseline might come from a non-normally distributed population. Shapiro-Wilk test showed significant deviation from normality for the control ($W = 0.95, p = 0.046$) and the experimental group ($W = 0.94, p = 0.016$). However, due to the postulates of the central limit theorem and the observed distribution in the histograms (see Appendix B), we believe that the test results should be mostly unaffected.

Manipulation Check

The manipulation check of MiL was conducted using a RM-ANOVA. The results (as shown in Figure 1 below) showed a statistically significant effect ($F = 24.605, p < 0.001$) of the MiL intervention on increasing MiL in participants in a follow up measurement. Compared to the control condition, who did not show a significant increase in meaning ($F = 0.031, p = 0.862$).

Figure 1

Means Plots Displaying MiL in the Intervention Group (left) Versus Control (right).



Note. The dots represent the mean values of depressive symptoms, while the error bars show the 95% confidence intervals.

The effect size for this difference was found to be small to medium ($\eta^2 = 0.051$).

Thus, the meaning intervention seemed to increase MiL at a small to medium effect size.

Depressive Symptoms

The depressive symptoms were measured using the depression-related questions of the DASS-21 questionnaire at two time points: baseline and follow-up (FU). The severity of the depressive symptoms were then assessed by using the established DASS-21 cut-off criteria (S. Lovibond and P.Lovibond, 1995). The results of this assessment are indicated in Table 1 below.

Table 1

Frequency Table Displaying the Levels of Severity for Depressive Symptoms at Baseline and FU

Time	Severity of symptoms	Count	Valid percentage
Baseline			
	Normal	55	56.7
	Mild	16	16.5
	Moderate	11	11.3
	Severe	7	7.2
	Extremely Severe	8	8.3
Follow-up			
	Normal	61	62.9
	Mild	7	7.2
	Moderate	22	22.7
	Severe	4	4.1
	Extremely Severe	3	3.1

Note. The count denotes the number of participants within each specific category. The valid percentage represents the proportion of all participants ($n = 97$) who meet the criteria for that category.

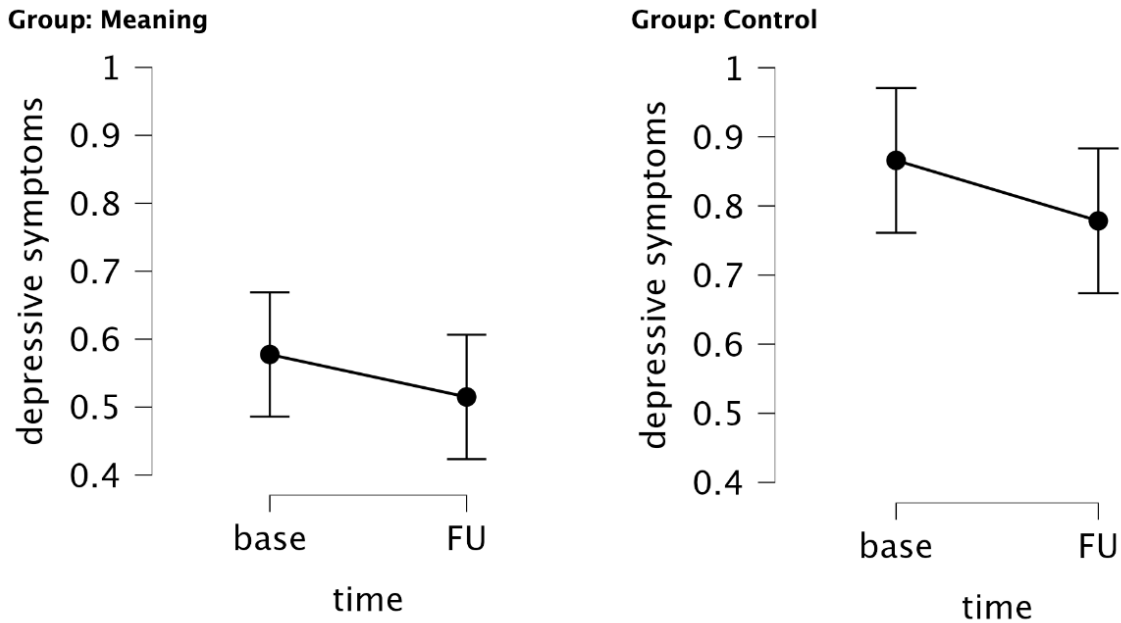
Generally, it can be seen that at the FU, the proportion of participants with ‘normal’ depressive symptoms increased compared to the baseline. Furthermore, there seemed to be an increase in participants who reported to have ‘moderate’ depressive symptoms. However, fewer people exhibited symptoms in the ‘severe’ or ‘extremely severe’ categories. The trend indicates that, on average, participants experienced less severe depressive symptoms at the FU compared to the baseline.

H1

To test the effectiveness of our MiL intervention in reducing depressive symptoms, specifically testing the hypothesis (H1) that the meaning-intervention group would report fewer depressive symptoms at a one-week FU compared to the control group, a RM-ANOVA was conducted. The results, illustrated in Figure 2 below, indicate that while depressive symptoms appeared to decrease in both groups, there was no significant difference between the reduction in depressive symptoms for the intervention group compared to the control group ($F = 0.065, p = 0.799$).

Figure 2

Means Plots Displaying the Change in Depressive Symptoms in the Intervention Group ($n = 48$) vs Control ($n = 49$)



Note. The dots represent the mean values of depressive symptoms, while the error bars show the 95% confidence intervals.

Relationship-Related Goal Pursuit and Depressive Symptoms

To test the exploratory hypothesis that relationship-related goal pursuit would be beneficial in decreasing depressive symptoms, a correlation analysis was conducted. In this, all coded goals were correlated with changes in depression. The results indicated no significant relationship between relationship-related goal pursuit and changes in depressive symptoms ($r = -0.057, p = 0.708$). Therefore, working on relationship-related goals did not seem to be a significant predictor for lower depressive symptoms.

Relationship-Related Goal Pursuit and MiL

To test the exploratory hypothesis that relationship-related goal pursuit would be beneficial in increasing MiL, we correlated relationship-related goals with the change in meaning from the baseline vs. the follow-up. The results showed that relationship-related goal pursuit was not significantly correlated with an increase in MiL ($r = 0.149, p = 0.323$).

Post Hoc Analyses

To examine whether participants actively pursued their relationship-related goals, a post hoc analysis was performed. This analysis involved the calculation of a partial correlation between participants' relationship-related goals and their self-reported effort in working on their interpersonal relationships after a one-week follow-up, controlling for baseline relationship effort. The results showed that there was no statistically significant correlation between the variables ($r = -0.048, p = 0.762$).

Correlation Between Variables

In order to gain a better understanding of the relationship between the variables of interest in this study, we examined the correlations among MiL at baseline and follow-up, depressive symptoms at baseline and follow-up, the coded goals of participants and the effort they put into working on interpersonal relationships. The results are displayed in Table 2 below.

Table 2

Descriptive Statistics and Correlation Matrix for Study Variables (total n = 97)

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. MiL base	4.83	1.22						
2. MiL FU	5.08	1.22	0.680**					
3. Depression base	0.72	0.68	-0.676**	-0.520**				
4. Depression FU	0.66	0.53	-0.573**	-0.659**	0.713**			
5. Coded goals	0.38	0.49	-0.096	-0.005	-0.042	-0.007		
6. Relationship-Effort	66.07	22.46	0.330**	0.392**	-0.312*	-0.417**	-0.168	

Notes. *M* and *SD* are used to represent mean and standard deviation. * indicates $p < .05$. ** indicates $p < .01$. The coded goals variable was only present in the MiL condition ($n = 48$).

The results of this correlation analysis revealed that baseline measures of MiL were significantly correlated with participants' perceived MiL at FU ($r = 0.68, p < .01$). Participant's depressive symptoms showed a significant inverse correlation with MiL at both baseline and follow-up. The coded goal variable showed no significant correlation to any other variable of interest. The effort that participants put into working on their interpersonal relationships was significantly positively correlated with both baseline and FU measures of MiL, and significantly negatively correlated with depressive symptoms at baseline and FU.

Discussion

The aim of this study was to determine if a brief online MIL intervention could reduce depressive symptoms in participants after a one-week follow-up. Next to this, we wanted to explore whether a relationship-related goal pursuit would be beneficial in reducing depressive symptoms and increasing levels of perceived MiL in participants.

The main findings of this study are that our brief, online MiL intervention was effective in significantly increasing the participants' sense of MiL, compared to the control. However, we did not find a significant effect of our intervention on a decrease of depressive symptoms between the two conditions, although both groups showed a general decline in depressive symptoms over time. Next to this, there was no relation found between working on relationship-related goals and reductions in depression or increased levels of meaning.

Our findings did not support our hypothesis (H1) that the meaning-intervention group would report fewer depressive symptoms at a one week follow-up questionnaire compared to the control group. Although there was a general decline in depressive symptoms from baseline to FU, this change was not significantly different between the intervention and control group. These findings are in contrast with past literature (Marco et al., 2023) which suggested that a MiL intervention could effectively reduce depressive symptoms. One possible reason for our null finding is that past research primarily focused on clinical samples

who displayed higher depressive symptoms, whereas our sample consisted mainly of students experiencing depressive symptoms within the normal range. A recent systematic review by Cuijpers et al. (2022) revealed that psychological interventions targeting depressive symptoms tend to show better outcomes when the baseline severity of depression is higher. Therefore, it is possible that our sample did not present with depressive symptoms severe enough to be impacted by the intervention. There was however a significant interverse correlation found between MiL and depressive symptoms. This finding aligns with past research indicating a strong inverse link between these variables (Dewitte et al., 2022; Marco et al., 2024; Van Doornik et al., 2024). These findings imply that while a brief MiL intervention may not effectively reduce depressive symptoms in a non-clinical sample with predominantly normal depressive symptoms, it could potentially be more beneficial for individuals with higher levels of depression. Future research should focus on evaluating this intervention in populations with more severe depressive symptoms to better assess its efficacy.

The exploratory questions examining whether relationship-related goal pursuit is related to reductions in depression and increased MiL found no support. These results are in contrast with past research which suggested that working on interpersonal relationships would be beneficial in improving participants mental health (Canevello & Crocker, 2011) and perceived MiL (Glaw et al., 2016). One potential reason for this discrepancy is revealed by our post hoc data analysis, which showed no correlation between relationship-related goal pursuit and the effort participants put into working on their interpersonal relationships. This suggests that the null findings may be due to participants' lack of effort in actively pursuing the relationship-related goals they set for themselves. However, our correlation analysis indicated that the effort participants invested into their interpersonal relationships was significantly positively related to their levels of perceived MiL and lower levels of depressive

symptoms. These findings support the theory that actively engaging in interpersonal relationships is linked to increased feelings of meaning and reduced depressive symptoms (Eberhart & Hammen, 2000; Kieraitė et al., 2024; Zlotnick et al., 2000). Thus, while merely having relationship-related goals did not directly lead to reduced depression, the effort put into these relationships appears to be crucial for enhancing MiL and mitigating depressive symptoms. This indicates that strong interpersonal relationships remain important when considering MiL and depressive symptoms. Future research might benefit from examining the role of effort in working on these relationships as a key variable.

Limitations

Several limitations in this study may have contributed to the null findings regarding our MiL intervention. Apart from the previously mentioned limitations of this study - namely, the low depressive symptoms in our sample and the lack of effort invested into working on relationship-related goals - another possible explanation for the unexpected null results is that the study may have been underpowered due to an insufficient sample size. With the current sample size, we had only a limited power of 0.67 to detect a medium effect size. Therefore, our sample might have been too small to detect a true effect of the intervention. Furthermore, the participants in this study came from various nationalities, most of whom were non-native English speakers. While we controlled for participants to self-report at least a moderate fluency in English, this factor could have influenced their responses.

Next to this, there are other limitations that might limitate the generalizability of our study findings. Our sample consisted primarily of first-year business students in their early twenties from the University of Groningen. This raises the question whether the results of this study can be generalized to other populations from different backgrounds and age groups. Additionally, our analysis only included data from students who completed the follow-up questionnaire, which was administered approximately one week after the initial study. It is

possible that there are structural differences between those who completed the follow-up questionnaire and those who did not.

Strengths

The presented intervention in this study has several notable strengths. Our brief meaning intervention demonstrated a significant increase in participants' perception of MiL compared to the control group, even after a one-week follow-up period. The intervention is easily and flexibly administrable, requiring less than an hour to complete and can be conducted online. Moreover, it eliminates variability in delivery, as all participants receive the same video and audio material, unlike face-to-face interviews that might introduce interviewer-related variability due to differing styles or biases. Additionally, this method is cost-effective and time-efficient, as it does not require the presence of a trained professional. This could increase treatment accessibility for those who might otherwise be unable to receive therapy due to limited availability or cost constraints.

Future research

Future research could replicate the study using a different sample of participants. Furthermore, future studies could administer the intervention on a clinical sample and examine whether it is effective in reducing depressive symptoms in participants that display higher levels of depressive symptoms. Additionally, extending the follow-up period beyond one week could help determine whether the benefits of the MiL intervention on perceived MiL are sustained over time and if longer-term effects on depressive symptoms emerge.

It would also be intriguing to determine the specific component of the meaning intervention responsible for the increase in Meaning in Life. Future studies could explore whether either the audio or video alone could produce similar effects. Additionally, future research could explore different categories of goal pursuit and assess their impact on MiL

and/or symptoms of depression. It would be beneficial to measure the effort expended in pursuing these goals as well.

Summary

In conclusion, our brief online MiL intervention demonstrated to be a cost-effective and flexible method for successfully increasing participants' sense of MiL. However, contrary to our hypothesis, this increase in MiL did not result in a significant reduction in depressive symptoms between the intervention and control groups, even though depressive symptoms were significantly inversely related to MiL. The null effects observed might be influenced by the characteristics of the student sample, which had generally low levels of depressive symptoms. The findings suggest that while MiL interventions are beneficial for increasing the sense of meaning, additional strategies might be necessary to effectively address depressive symptoms, especially in populations with less severe symptoms of depression. Furthermore, the study found no association between relationship-related goal pursuit and reductions in depressive symptoms and an increased sense of MiL. Our correlation analysis revealed a significant relationship between the effort participants put into their interpersonal relationships and higher MiL and lower depressive symptoms. Therefore, this lack of significant results may be attributable to the participants' insufficient effort in pursuing the relationship-related goals they set for themselves. This might be an interesting finding to examine further in future research.

Declaration of Conflicting Interests

There are no conflicts of interest.

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Appendix A

List of common core values presented to participants

Please think about whether some of these common values are deeply important to you and then press the continue button to begin the guided exercise to consider your values.

Acceptance: to be open to and accepting of myself, others, life etc.

Adventure: to be adventurous; to actively seek, create, or explore novel or stimulating experiences

Assertiveness: to respectfully stand up for my rights and request what I want

Beauty: to appreciate, create, nurture or cultivate beauty in myself, others, the environment, etc.

Challenge: to keep challenging myself to grow, learn, improve

Connection: to engage fully in whatever I am doing, and be fully present with others

Contribution: to contribute, help, assist, or make a positive difference to myself or others

Courage: to be courageous or brave; to persist in the face of fear, threat, or difficulty

Creativity: to be creative or innovative

Curiosity: to be curious, open-minded and interested; to explore and discover

Encouragement: to encourage and reward behaviour that I value in myself or others

Fairness: to be fair to myself or others

Fitness: to maintain or improve my fitness; to look after my physical and mental health and wellbeing

Freedom: to live freely; to choose how I live and behave, or help others do likewise

Forgiveness: to be forgiving towards myself or others

Generosity: to be generous, sharing and giving, to myself or others

Gratitude: to be grateful for and appreciative of the positive aspects of myself, others and life

Honesty: to be honest, truthful, and sincere with myself and others

Humour: to see and appreciate the humorous side of life

Humility: to be humble or modest; to let my achievements speak for themselves

Industry: to be industrious, hard-working, dedicated

Intimacy: to open up, reveal, and share myself – emotionally or physically – in my close personal relationships

Kindness: to be kind, compassionate, considerate, nurturing or caring towards myself or others

Love: to act lovingly or affectionately towards myself or others

Order: to be orderly and organized

Open-minded: to think things through, see things from other's points of view, & weigh evidence fairly

Patience: to wait calmly for what I want

Persistence: to continue resolutely, despite problems or difficulties

Power: to strongly influence or wield authority over others, e.g. taking charge, leading, organizing

Respect: to be respectful towards myself or others; to be polite, considerate and show positive regard

Romance: to be romantic; to display and express love or strong affection

Self-care: to look after my health and wellbeing, and get my needs met

Self-development: to keep growing, advancing or improving in knowledge, character, or life experience

Self-control: to act in accordance with my own ideals

Sexuality: to explore or express my sexuality

Spirituality: to connect with things bigger than myself

Supportiveness: to be supportive, helpful, encouraging, and available to myself or others

Appendix B

Observed Distribution in the Histograms

