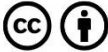# Reducing Loneliness in Undergraduate Students through E-Journaling Intervention: A Pre-Experimental Study

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ABSTRACT: The Covid-19 pandemic in Indonesia has had a devastating psychological impact on society, with the rise of online interaction failing to replace face-to-face interaction, particularly among undergraduate students. Loneliness is a prevalent mental health problem among students during the pandemic. This study aimed to assess the effectiveness of e-journaling intervention in reducing loneliness among undergraduate students. A pre-experimental design was used, with 38 undergraduate students participating in writing activities in the form of journaling every weekday for two weeks. Pre and post-tests were given using the De Jong Giervield Loneliness Scale to evaluate loneliness. The results of a Wilcoxon signed-rank test showed no significant difference in loneliness before and after the intervention, with only 40% of participants showing a decrease in loneliness. This suggests that e-journaling intervention is not an effective way to reduce student loneliness during the pandemic. A randomized controlled study is recommended for further exploration of the efficacy of e-journaling intervention.

INTRODUCTION

Covid-19 pandemic has brought devastating impact in Indonesia. The individual interactions faced several hurdles due to the implementation of activity restrictions policy. It was presumed that individuals felt emotional pressure and resulted in loneliness because of the limited interactions during the implementation of restrictions policy in pandemic situation (Juvonen et al., 2022).

Most learning activities were converted to online classes during Covid-19 pandemic situation. In 2020 and 2021, student activities on campus were also impeded to avoid crowding or lessen the risk Covid-19 infections. Face-to-face interactions became very scarce during pandemic situations and affected student's social interaction. Negative emotions might arise among students due to the disruption of their social relationship.

Both physical and mental health among students were affected in pandemic Covid-19. Studies found that emotional problems had been raising since the implementation of physical and social restriction policies (Abdalla et al., 2021; Dawel et al., 2020; Fiorillo et al., 2020). The lack of other presences might contribute to this condition because many of them were restrained at home. Nevertheless, the existence of social interaction was as important as other factors in maintaining psychological well-being (Holt-Lunstad et al., 2010).

When the social interaction was insufficient, the risk of feeling lonely would be increased (Banerjee & Rai, 2020; A. L. Campbell & Shore-Sheppard, 2020), especially when people were isolated for a fairly lengthy period of time (Stickley & Koyanagi, 2016). During the pandemic situation, people tend to be dissatisfied with their mutual contact (Juvonen et al., 2022). Therefore, loneliness is one

of the most common psychological problems raised during the pandemic Covid-19 (Killgore et al., 2020).

Loneliness was highly associated to social relationship. Essentially, loneliness did not arise because of the quantity of persons to be interacted with, but the quality of relationship might induce it. According to Perlman dan Peplau (1981), loneliness emerged in a person when their relationship's quality was not fulfilled as they expected. Thus, loneliness was the manifestation of individual's unsatisfactory feeling towards their social interactions

. Individuals with the disrupted social relationship were indeed at risk of experiencing loneliness and the limited interactions toward other people would only worsen it (Masi et al., 2011). Unfortunately, the limitation of social relationship was not only affected by external factors. Individual factors could cause the obstacle of socializing with other people and it might emerge the loneliness. Lower self-esteem and more self-blaming in lonely people would only restrain them from building social interactions (Cacioppo et al., 2006). At some point, this individual factor had caused more troubles than being socially isolated.

Loneliness was not a condition that could be neglected easily. It was highly associated with emotional disorders such as depression, suicide attempts and other somatic disorders (Ingram et al., 2020; Richardson et al., 2017; Stickley & Koyanagi, 2016). Besides the psychological impact, loneliness could also jeopardize someone's health, such as affecting the sleep quality, reducing physical activity, and increasing bad habits (Theeke, 2009). It affected a person's physical and mental condition that could lead to the risk of death (Holt-Lunstad et al., 2015; Ingram et al., 2020). To be concluded, loneliness needs to be concerned seriously.

Several interventions given to a group of individuals with loneliness problems found to be successful in reducing loneliness, although some others did not (Eccles & Qualter, 2021; Masi et al., 2011). Unfortunately, most of the loneliness intervention activities were conducted in the form of group activities—requiring more time and funds—yet the effectiveness only occurred in a short time (Bessaha et al., 2019; Mann et al., 2017; Offenhauser, 2021). Many loneliness interventions were targeting social skill (Masi et al., 2011) but a few of them were concerned regarding their perceptions.

As defined by Peplau & Perlman (1982), individuals could experience loneliness even though they were not in isolated situation. This statement implied someone could have people around them and communicate with them, yet they might still feel lonely. These maladaptive thoughts had brought someone to feel unworthy and blame themselves, then led them to encounter the obstacle in interacting with others (Mann et al., 2017). Thus, the individual's thoughts could be the cause of their loneliness.

Managing the maladaptive thoughts regarding social relationship was one of the intervention's target in reducing loneliness (Masi et al., 2011). By intervening the individual's cognitive bias, they might start building interaction towards others since their self-perception and perception to others were being more reasonable. Thereby, the improvement of social connectedness would potentially affect the quality of relationship then reduce loneliness (Hickin et al., 2021; Mann et al., 2017). Individuals were expected to be enlighten after receiving the intervention and re-assess their perspective regarding social interaction.

Most loneliness interventions were involved either physical or face-to-face interactions (Eccles & Qualter, 2021). Unfortunately, for those who experience loneliness, engaging in face-to-face interaction might be troublesome (Offenhauser, 2021). Imposing lonely people to have direct communication might induce stress, feel uncomfortable and eventually reluctant to manage their loneliness. Treat the personal misjudgment of social relationships needed before managing the social skills to form the sense of connectedness with others (Mann et al., 2017; Masi et al., 2011).

Writing was prone to be easier for people with loneliness because it was less terrifying to deal with. As a personal activity, writing did not require any social interactions. Someone could express their thoughts and feelings in their writing freely with no judgement from others. According to Ullrich & Lutgendorf (2002), sharing the awful experiences or traumatic events through writing could support mental health. Although the process of reflection during writing could cause cognitive dissonance, the maladaptive thoughts would also be enlightened and expected to be diminished.

Journaling is one of the organized forms of writing which imposed someone to build a self-dialogue. In journaling, individuals were enforced to induce a complex process—clarifying, evaluating, and reflecting situation or problems (Roodt & Niemann, 2015; Stevens & Cooper, 2009). Journaling could provide therapeutic effects because it facilitated someone to do self-reflection (Burnett & Meacham, 2002; White & Murray, 2002). It was assumed that journaling could be applicable for managing maladaptive thoughts.

The benefit of journaling was tremendously recognized. Journaling was not only providing therapeutic effect (L'Abate, 2001) but also building the self-awareness (Burnett & Meacham, 2002). Writing a journal helped shy people to communicate their feelings and thoughts without directly stated it (Martin & Thomas, 2000). Moreover, journaling as a therapy was perceived less intimidating because no face-to-face interactions required (DeGangi & Nemiroff, 2009). Generally, for those experiencing loneliness and finding obstacles in building social interactions, expressing their thoughts in journal was greatly beneficial.

Since people were being hesitated to gather with a bunch group of people since pandemic Covid-19, utilizing technology in mental health intervention was encouraged. The pandemic situation was not supposed to be an excuse to postpone any mental health interventions. Conducting mental health intervention using technology was a remarkable yet feasible solution in this situation. Digital-based intervention was not only complying the restriction but also facilitating those who need helps, including for people with loneliness.

Rationale for the Study

Journaling intervention might be old-fashioned yet still applicable in the field of psychotherapy. Journaling used to be associated as a paper and pencil activity (King & LaRocco, 2006) and it was quite outdated in the recent condition. Technology was prone to replace books and paper nowadays because it was easier, cheaper, and more convenient. Additionally, the transformation of the traditional journal into digital journal could debunk the illogical resistance in writing (Cyboran, 2005), especially among young people. Writing journal in any forms would be beneficial but utilizing electronic journaling was expected to broaden the alternative forms of journaling interventions.

Pandemic Covid-19 had transformed many lives and changed how people interact to each other. The large exposure of technology provided a huge benefit in many activities. Technology was not only connecting people but also accommodating many things in a simpler way. Unfortunately, the overexposure of technology was also caused the fatigue and led to the needs of digital detox to protect individual's mental health (Bacchi, 2021). This fact shows that technology helped people and caused the trouble at the same time.

Journaling intervention has been widely explored and endorsed to be one of the strategies to support mental health. Yet, studies that explore the impact of journaling activity in reducing loneliness during pandemic situation was still limited. Although technology had helped many aspects in daily life, people have been overexposed to technology. Therefore, the benefit of digitalizing the journaling intervention was still debatable.

Objectives

This study aims to examine the effectiveness of e-journaling intervention to loneliness among undergraduate students during pandemic Covid-19. It is hypothesized that e-journaling intervention can reduce loneliness so it will be beneficial for mental health. This study is expected to broaden the alternatives of mental health intervention in the digital era, especially in pandemic situation.

METHODS
Design

This study was a quantitative study with a pre-experimental design. This study was prior research before the actual experimental research with more subjects would be included in the future. In this design, fewer participants were involved in this study to collect the preceding evidences of manipulation's effect Campbell & Stanley (1963).

This was a one-group pre and posttest design study, so every participant would receive the treatment with no control group as the comparison. As the study was investigated the impact of treatment towards loneliness, participants' loneliness would be evaluated before and after the experiment. Ethical clearance for this study had been granted previously by Konsorsium Psikologi Ilmiah Nusantara (KPIN) number 038/2921/Etik/KPIN.

Participants

The convenience sampling was applied in this study with the sample criteria were active students in diploma or bachelor's degree. This is a voluntary-based study which participant's recruitment was held openly and no forces in joining to the study. Prior explanation regarding the study had been delivered and the informed consent form was signed by participants. Data given from this study were confidential and participants had rights to withdraw from the study. Only participants who accomplished the activity until the end of the study would be included in data analyses. This study only included participants with loneliness. Ahead of the study, participant's loneliness was assessed using the scale. At first, 50 participants were recruited in this study yet only 38 participants were identified having loneliness. Unfortunately, only 30 participants remained until the end of the study.

Materials

This study aimed to identify the impact of e-journalling intervention in reducing loneliness among undergraduate students during pandemic Covid-19. E-journaling was the manipulation of the experiment, and the entire participants received it in the form of writing digital journal frequently during the study. Participants were asked to share their entire daily activities, then reviewed and reflected their day through the e-journalling session. Several elicit questions provided to help participants sharing and reflecting their days in the journal.

Loneliness was measured using De Jong Giervield Loneliness Scale, a multidimensional instrument constructed by Giervield and Tilburgh to measure general loneliness. There were six items consisted of two dimensions—social loneliness and emotional loneliness. The instrument has been adapted by Wedaloka & Turnip (2019).

Items 1, 5 and 6 measured social loneliness, meanwhile items 2, 3, and 4 measured emotional loneliness. The response choices varied between "Strongly disagree" to "Strongly agree". For items 1, 5 and 6, response "strongly disagree" and "disagree" were scored 0 yet response "strongly agree" and "agree" were scored 1. Conversely, response "strongly disagree" and "disagree" in items 2, 3, 4 were scored 1 while response "strongly agree" and "agree" were scored 0. Participants with range score 2 to 6 were identified experiencing loneliness.

Table 1. Participant's demographic characteristic

Descriptions	N	%
Gender		
Male	10	33.3
Female	20	66.7
Residency		
Jakarta, Bogor, Depok, Tangerang, dan Bekasi (Jabodetabek)	26	86,7
Non-Jabodetabek	4	13.3
Living with		
With family	28	93.3
With others (friends or alone)	2	6.67
Romantic relationship status		
Single	9	30
In romantic relationship	21	70

Table 2. Participants' loneliness description

Descriptions	Min	Max	Mean	SD
Before intervention (*Pre-test*)				
Loneliness	0	6	2.73	1.23
Emotional loneliness	0	3	1.23	.77
Social loneliness	0	3	1.50	1.50
After intervention (*Post-test*)				
Loneliness	0	6	2.60	1.73
Emotional loneliness	0	3	1.23	1.00
Social loneliness	0	3	1.37	1.09

Table 3. Participant's loneliness after intervention

Descriptions	Frequency
Condition result after receiving intervention	
Change to not lonely	13
Remain lonely	17
Score result	
Score decrease	12
Score no change	9
Score increase	9

Table 4. Hypothesis testing results

Descriptions	Z	*p*
Loneliness	-.597	.551
Emotional loneliness	.000	1.000
Social loneliness	-.734	.463

Procedures

This study was held for three weeks in November 2021 during weekdays. The writing electronic journal activity was mainly carried out using online form (Google form). Participants received daily message every weekday at 8 pm during the intervention to remind participants fulfilling their journal. The access of e-journalling activity remained open until 11 pm. Participant got time-off from the intervention during weekend.

To help participants wrote the journal, several questions deliberately given to participants to elicit their story of the day. Participants were asked about their activities in a day, such as what activities they had for the day, how was their feeling at the end of the day, how they evaluated their

day and what insight they found after finishing their day. Additionally, participants were asked to rate their loneliness feeling during the day on scale 1 to 10.

Participants were encouraged to write the journal as much as possible with no topic or time limitation. The elicit questions were not obligatory, so participants might share everything regarding their day. All participants were confidential and would be only used for this study.

Participants' loneliness was evaluated before and after the intervention. As stated previously, only participants with loneliness included in this study. Participants were given the informed consent before the intervention started. On the last day of intervention, participants were given several questions as the manipulation check to identify their feeling and perception towards the study and to rate their solemnity during the intervention. Researcher provided a debriefing session—disclosed the variable and aim of the study in the end of the study.

Data Analysis

Wilcoxon Signed-Rank test was performed to examine the impact of e-journalling intervention towards loneliness. This was a non-parametric statistical analysis which performed to compare a paired data—which participant's loneliness score in pre-test compared with their post-test. The lower loneliness score in post-test would indicate the e-journalling intervention successfully reducing loneliness.

RESULTS AND DISCUSSION
Results

Thirty-participants experiencing loneliness included in this study—two-third of them were female. All participants were an undergraduate students aged between 18 to 23 (M = 19.83; SD = 1.59). Most of participants were students from Universitas Negeri Jakarta and one-third of them were psychology students.

The majority of participants lived in Jabodetabek (86.7%), yet one-third of participants were lived in Sumatra and only one participant stayed in Bali. Almost all participants live with their family (93%). Additionally, 70% of participants were in romantic relationship. For more information, please check table 1.

The entire participants were confirmed experiencing loneliness in the prior assessment (*pre-test*) and received the e-journalling intervention. Before testing the hypothesis, participants' loneliness condition was explored using the instrument before and after the intervention. For more information, please check table 2.

The pre-test evaluated participant's loneliness before getting the intervention. The result of pre-test found the mean score of participants' loneliness was 2.73 (SD = 1.23) which score varied between 0 to 6. The mean score of participants' emotional loneliness was 1.23 (SD = .77), meanwhile the mean score of participants' social loneliness was 1.50 (SD = .86). which score varied between 0 to 3. On the other hand, the post-test was administered in the end of the intervention to evaluate changes in participant's loneliness. The mean score of participant's loneliness after received the intervention was 2.60 (SD = 1.73) which score varied between 0 to 6. With the range score varied between 1 to 3, the mean score of emotional loneliness among participants after the intervention remained the same (M = 1.23; SD = 1.00), yet participant's social loneliness was slightly lower than before receive the intervention (M = 1.37; SD = 1.09). The higher mean score reflected the more loneliness experienced by the participants.

The evaluation of loneliness was also identified participants condition—whether she/he was experiencing loneliness (lonely) or not (not lonely). The pre-test identified 10 participants were in-between lonely and not lonely, while other participants were clearly having loneliness. In the end of

intervention, there were 12 participants whose loneliness score declined, and 9 participants had no change in their loneliness. Surprisingly, there were 9 participants whose loneliness increased after completing the e-journaling intervention. To be concluded, 13 participants were found having no loneliness experience yet 17 participants still had loneliness in the end of the study. For detailed information, please check table 3.

To examine the significant impact of e-journaling intervention to loneliness, three statistical analyses were performed. The initial hypothesis was tested to the overall loneliness score, meanwhile the other two hypotheses were performed specifically to investigate the impact of e-journaling intervention to participants' emotional and social loneliness. The entire hypothesis testing was accomplished using the Wilcoxon Signed-Rank Test.

The Wilcoxon-Signed Rank test found no significant differences in participant's loneliness generally after the intervention ($Z = -.597$; $p > .05$). The same result was also found in emotional and social loneliness condition. There was no significant impact in emotional loneliness ($Z = .000$; $p > .05$) and in social loneliness ($Z = -.734$; $p > .05$) among participants in the end of intervention. For more information, please check table 4.

Discussion

The result of this study found no significant different conditions in participants' loneliness before and after e-journalling intervention. Neither emotional loneliness nor social loneliness was also affected by the intervention. Although there were 9 participants whose loneliness were not improving, yet there were 12 participants whose post-test score were lower than the pre-test score. Surprisingly, there were 9 participants whose loneliness score was higher in the end of intervention. This study revealed that more than half of participants were still lonely until the last e-journalling session. In general, this study indicated that e-journaling intervention was unsuccessfully reducing loneliness.

Unpredictably, this study found some participants whose initially in-between lonely and not lonely became lonely after receiving the intervention. Initially, researcher suspected the use of self-assessment instrument in evaluating loneliness might contribute to this result. Participants' loneliness was identified by their response in the instrument, so the researcher had no ability in confirming their loneliness evaluation. Then the journal writing activity provided the opportunity for participants to re-evaluate their condition and circumstances. Researcher assumed that e-journaling activity helped participants to have "conversation" to themselves, so participants might reflect their loneliness condition after receiving the e-journaling intervention (Roodt & Niemann, 2015). This situation contributed to the possibility that someone became lonely after re-evaluate their condition during the e-journaling session.

The result of this study was inconsistent with previous studies which mostly demonstrated the positive impact of journaling. Past studies showed that journaling helped individuals to manage their emotions (Lara, 2020) and reduce anxiety (Smyth et al., 2018). This study indicated the opposite results—instead of reducing it, the e-journaling intervention in this study leveraged the loneliness. As stated previously, researcher presume the e-journaling activity helped participants to reflect their daily life then become more aware of their loneliness.

Interestingly, the result of this study was supported by several studies about writing activity in pandemic context. Vukčević Marković et al. (2020) found that journaling was not quite supportive to mental health during pandemic situation. Self-compassion journaling also failed in reducing loneliness during pandemic Covid-19 (Offenhauser, 2021). These studies showed that writing journal unsuccessfully boosted mental health during pandemic situation.

According to Offenhauser (2021), loneliness was not only a tough condition but also difficult to be sorted out. Loneliness is an individual's satisfaction regarding their social relationship (Peplau & Perlman, 1982). Thus, loneliness was not always developing in an isolated condition. To resolve individual's loneliness, it would not as simple as providing someone besides them. Someone could still experience loneliness in the middle of the crowd. Solving the loneliness issue might start from amending the individual's perceptions regarding their social relationship. Unfortunately, aiming to reform the mindset was a complex process which required a longer time and consistencies. Short-time intervention would not be sufficient to provide a significant impact in reducing loneliness.

Writing was an individual's activity which did not directly target the social skills which might affect their social relationship (Offenhauser, 2021). Although loneliness might emerge in the middle of the crowd, being isolated and had no interaction with someone else would increase the risk of loneliness. Individuals could reflect their situation and feeling through journaling, yet journaling was still not presenting anyone to interact with. Writing was not enough to facilitate individuals sensing the presence of someone else to be interacted since there was no two-sides interaction occurring during the journaling session. Journaling might help to alter individual's perceptions towards the presence of somebody else, but it was not facilitating individuals to be socially connected. Future studies might consider adding group activity in the loneliness intervention.

Marković et al. (2020) found that expressive writing unsuccessfully reduced stress during pandemic Covid-19. The study even discovered that the participants had higher stress in the end of writing treatment. Marković et al. (2020) argued that the unpleasant feeling in pandemic Covid-19 had individuals become more aware to their powerless in this situation after receiving the intervention. The same situation might be applicable to this current study that found writing journal had insignificant impact towards loneliness.

Implications

The findings of this study have important implications for addressing loneliness among undergraduate students during the Covid-19 pandemic in Indonesia. The results indicate that e-journaling intervention may not be effective in reducing loneliness among this population, highlighting the need for alternative approaches. It is crucial for mental health professionals and educators to understand the complexities of loneliness and the various factors that contribute to its development. While e-journaling may have some benefits for mental health and well-being, it may not be the most appropriate intervention for reducing loneliness in the context of the Covid-19 pandemic.

Limitations and Suggestions

This study had several limitations, including a small sample size of 38 participants and a pre-experimental design that limits the ability to establish causality. The De Jong Gierveld Loneliness Scale used in the study may not capture all aspects of loneliness and the results may not be generalizable to other countries or populations. A larger sample size, a randomized controlled study design, and a comprehensive measure of loneliness would provide stronger evidence of the effectiveness of e-journaling intervention in reducing loneliness among undergraduate students during the Covid-19 pandemic. Further research is needed to explore the effectiveness of e-journaling intervention in different contexts and cultures

CONCLUSION

This study found that e-journaling intervention was not effective in reducing loneliness among undergraduate students during the Covid-19 pandemic. Although some participants had lower

loneliness scores after the intervention, the results were not significant. This finding was inconsistent with prior studies that showed the positive impact of journal writing, but supported by other studies that found journaling to be ineffective in reducing loneliness during pandemic situations. The impact of e-journaling intervention on loneliness may be influenced by the pandemic situation that interfered with social connectedness. E-journaling may be suggested as a complementary treatment to maintain mental health, but clinical supervision and other treatments may be necessary for a comprehensive evaluation of mental health. Further research is needed to reinvestigate the impact of e-journaling intervention on mental health once the pandemic situation has improved.

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AUTHOR CONTRIBUTION STATEMENT

All authors made equal contributions and have approved the final version of the manuscript.

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