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RESEARCH ARTICLE

AUTOMATED TEXT-BASED PSYCHOLOGICAL SUPPORT TO IMPROVE WORK-LIFE BALANCE AND SLEEP QUALITY: A PILOT STUDY REPORT OF WORK-FROM-HOME WORKERS IN INDONESIA

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ABSTRACT

BACKGROUND:

Work-at-home jobs may raise the risk of mental health concerns as they blur the boundaries between one's job and personal responsibility. This study aimed to develop and test the feasibility of an online psychological intervention using the WhatsApp©messaging application.

MATERIALS AND METHOD:

During the 14-day intervention period, two messages were sent twice a day consisting of positive psychological affirmation aimed at assisting participants (N= 48; 13 males and 35 females) to achieve work-life balance and better sleep quality. The Indonesian-adapted Fisher's work-life balance scale and the sleep disturbance scale were used to measure both constructs. These measures were administered at the beginning and end of the intervention. In addition, we provided participants with brief open-ended questions to check the program's feasibility and acceptance of the intervention.

RESULTS:

A paired t-test analysis revealed that although there was an increase in work-life balance scores in the post-test compared to the pre-test, the difference was not significant ($t\ (47) = -1.75$, $p > .05$). Nevertheless, individuals' sleep quality scores improved significantly after the intervention ($t\ (47) = -2.85$, $p < .05$).

DISCUSSION:

The findings of this study are expected to provide a preliminary argument to further pursue the development of behavioral interventions using online strategies in Indonesia during the pandemic.

KEYWORDS

automated text-messages, COVID-19, Indonesia, sleep quality, tele-mental health, work-life balance

INTRODUCTION

The COVID-19 pandemic has led to major shifts in how people perform their jobs. Social restriction regulations require employees to apply the work from home (WFH) method. According to data from the Health Authority, more than one million workers returned to work from home in Jakarta alone during the Omicron variant wave that emerged early last year. With its widespread use in modern corporations, work from home (WFH) has not been widely adopted in Indonesia's traditional organizations because of

the lack of supporting infrastructure and high-context culture. [1]

While more people are engaging in this method of work during the pandemic, scholars have warned about the mental health consequences of this work trend. [2,3] An existing study highlighted that the biggest challenge for those working from home is maintaining a balance between work and personal life. [4] Under normal circumstances, the actions involved in moving from home to work are an inseparable part of the job. This physical mobility often gives people psychological flexibility, allowing for a smoother transition from their roles at work to their personal/social roles. Unfortunately, unstructured shift work, as commonly found in work-from-home methods, may be associated with psychological tensions, leading to adverse impacts on mental, social, and physical health. [5] Scholars have indicated that this work arrangement is also potentially associated with an increased risk of metabolic disorders and cardiovascular abnormalities, leading to a higher risk for poor sleepers. [6,7] In addition, previous studies linked lack of control over work hours to poor health and sleep quality outcomes. Individuals working in such shifts, including those working from home during the pandemic, frequently report disturbances in sleep and alertness. [8,9] This work-time control issue may be explained by the disparity between the physical and psychological demands of a shift work schedule and the oscillations of biochemical, physiological, and behavioral variables regulated by the individual's circadian clock.

Studies indicating the mental health impact of WFH have a foundation from a sociocultural perspective. Several studies have implied that Asian societies with strong collectivistic cultures might face challenges when applying such work arrangements. [1, 10] Collectivist cultures place high value on hierarchical ties, which are often symbolically articulated in noticeable cues (facial expressions, clothing, and body languages). [11] Unfortunately, WFH restricts such connections, making the manager-employer relationship less effective. Scholars indicate that leaders' authority to supervise and evaluate their subordinates will also be curtailed as soon as face-to-face contacts are confined. [12] In addition, individuals living with collectivist values consider society not just as a source of psychological support but also as a means of developing one's identity. [13] Working primarily from home during WFH may cause a sense of social isolation and further disrupt one's role in society [14] Consequently, the disruption of social roles during the COVID-19 pandemic can affect an individual's ability to maintain a psychological balance between their professional and social lives.

Earlier studies have shown that individuals who can manage work life balance (WLB) have better levels of psychological well-being and mental health; [15,16] stronger work commitments [17]; job satisfaction; [18] and a sense of well-being. [19] Previous study indicated that work/nonwork integration increases social role permeability. [20] There are few examples of organizational strategies to promote balance, such as providing family benefit packages, offering flexible working hours, encouraging job sharing, and allowing people to telecommute. [21] However, since the pandemic began, most workplace agendas have shifted to an online-based approach. Therefore, online intervention was the most plausible choice.

LITERATURE REVIEW

Scholars define WLB as the extent to which one's satisfaction in work and family roles is compatible with life role priorities [22]. They suggest that the 'role' theory is the foundation that underpins this concept. According to this theory, everyone is assigned a set of responsibilities based on their social roles and norms. When someone fails to fulfil their responsibilities, it will result in personal conflict [23]. Scholars indicated that this work/non-work integration increases one's role permeability, which means "the extent to which one position can be situated physically in the role's domain, but psychologically and/or behaviorally participating in another role" [23 p.27]. As such, individual attempts to balance often lead to inter-role conflict, which arises because of the social pressures from both work and life/personal outside of work. [24] Thomason & Williams argues that the pandemic exacerbates social divisions by amplifying a major separation between working and not-working responsibilities. This role conflict could obstruct individual's performance in the organization, which mostly manifests as absenteeism, low work productivity, high turnover, and physical disturbances (e.g., sleep quality).

Psychological intervention based on text messaging is a telemental health service widely used to help people with limited time and poor access to psychological services. [25,26] Several studies have demonstrated the effectiveness of text-based online intervention that significantly improve people's well-being level [27, 28] perceived social support; [29] sleep quality; [30] and self-

awareness. [31] Text messaging-based intervention is a popular telemental health service during pandemics,[25] however, the use of this instrument in occupational stress and work-related mental health problems is unclear, and there is very limited data to support its efficacy in the Indonesian community. The theoretical underpinnings for developing the messages used in this study were based on positive psychology interventions (PPIs) approach [32], refers to the Self Determination Theory (SDT) [33]. The SDT is a well-known human motivation theory that has been applied to a wide range of health and clinical studies, including in tobacco addiction [50], nutrition intake [51], and physical activity [52]. Earlier studies suggest that the SDT may be critical for understanding why people want to engage in psychological treatment or do not. This theory has become a notable model for explaining the motivational dynamics which underlies the regulation of health behaviors and interventions in health contexts. Instead of its limited use in the Indonesian context, growing evidence supporting its rationale and utility in promoting and explaining health behavior modification, including how it is applied in this current online intervention [51, 52]. The SDT suggests that individual's ability to be fully functional, including maintaining their mental health, is contingent upon their ability to perceive their own competence, feel connected to others, and be internally driven. When an individual can meet these goals, their quality of life is expected to improve [33]. The messages used in this study were based on three dimensions of SDT: 1) competence, which is the sense of being competent or effective in performing behaviors and dealing with situational demands; 2) relatedness, which is the need to feel connected to and accepted by a significant other in a particular context; and 3) autonomy, which refers to the individual's need to feel empowered and in control of their own behavior. When these requirements are met, people are more likely to feel motivated and able to adapt to adverse work demands [33]. A study examining the use of online psychological therapies based on the SDT discovered that participants expressed satisfaction with the intervention and felt it assisted them in establishing access to mental health resources [34].

We used the WhatsApp application, which is one of the most popular electronic message services in Indonesia. [35] Despite its growing use [36, 37] the utility of this tool in mental health practice is uncertain and evidence supporting the efficacy and feasibility of its application in the Indonesian population is lacking [38, 35]. Hence, our primary objective of this study was to examine the feasibility and efficacy of a text-based psychological intervention to enhance work-life balance and sleep quality among Indonesians working from home during the pandemic. This is the first study to investigate the feasibility of an online tele-mental health strategy for Indonesian employees during the pandemic using a pre-experimental approach. As such, this study is expected to serve as important preliminary evidence of online-based positive psychology interventions that aim to improve individual work-life balance and sleep quality during the pandemic.

In response to the preceding literature discussion above, we aim to adjudicate this knowledge gap by establishing a number of research questions set out below:

R1: How online messenger-based positive affirmation would assist individuals working from home in maintaining their work-life balance?

R2: How online messenger-based positive affirmation would assist individuals working from home in improving their sleep quality?

Based on the above research questions, this study proposed the two following hypotheses:

H1: Online messenger-based positive affirmations significantly impact an individual's work-life balance during work from home.

H2: Online messenger-based positive affirmations significantly impact an individual's sleep quality during work from home.

METHOD

DATA COLLECTION

Safety and ethical clearance were obtained from the Indonesian Scientific Consortium of the Psychology (KPIN) Ethical Committee (Number: 016/2021-Etik/KPIN).

Participants were invited through an internet link on social media and e-mail advertisements. Considering the pandemic social restrictions in place at the time of this study, the online recruitment method was deemed as the best option. The submission of online forms was regarded as consent to participate in the study. Participants were informed of the confidential nature of the study and their right to withdraw from the intervention without any penalty.

Participants did not receive any financial reward for their voluntary participation in the study; however, we provided 50.000-Indonesian rupiah worth of phone credit to reimburse their internet/data usage during the study. Any personal information (WhatsApp phone number and demographic information) collected in this study was stored in a secure drive folder with a password that could be accessed only by the lead author. Non-personal data (raw scores of the scales) are publicly available in an open-access data repository.

PROCEDURE

An online link consisting of information about the study and pretest batteries was sent to the prospective participants. Participants who met the demographic inclusion criteria and had a minimum cut-off standard score from the pre-test were notified that they would automatically receive text messages through the WhatsApp application at a predetermined time. The short messages contained positive affirmations and a question on how long participants slept at night ("How many hours did you sleep last night?"). While the positive affirmation messages were made with reference to three aspects of the SDT theory, namely Autonomy, Competence, and Relatedness. [32, 33] Prior to delivery, all messages were polled and curated by a professional psychologist to ensure validity. These messages were delivered in Indonesian and sent twice a day (morning and evening), while the slept question was only asked in the morning session. Participants received different messages during each session. Each participant received 28 different text messages over 14 consecutive days. Participants were told that there would be no personal dialogue through these messages and that there was no need to respond or reply to any messages they received. We also provided an open-ended question about the participants' experiences of the program on the 7th and 14th day of the intervention. To ensure participants had received the messages, we asked them to enable the 'read receipt' feature, so we could monitor when the messages were opened or read. At the end of the program, participants were debriefed and asked to fill out the post-test questionnaire and three additional questions about their satisfaction with the program.

SAMPLE

Participants were recruited from an Indonesian general population with the following specific inclusion criteria:1) Indonesian adults aged 18–55 years, 2) had a full/part-time job, 3) had been working from home for at least a month, 4) had an active WhatsApp number, 5) lived with parents/family members/friends, and 6) scored low to medium on the work-life balance scale provided in the pre-test session.

RESEARCH INSTRUMENTS

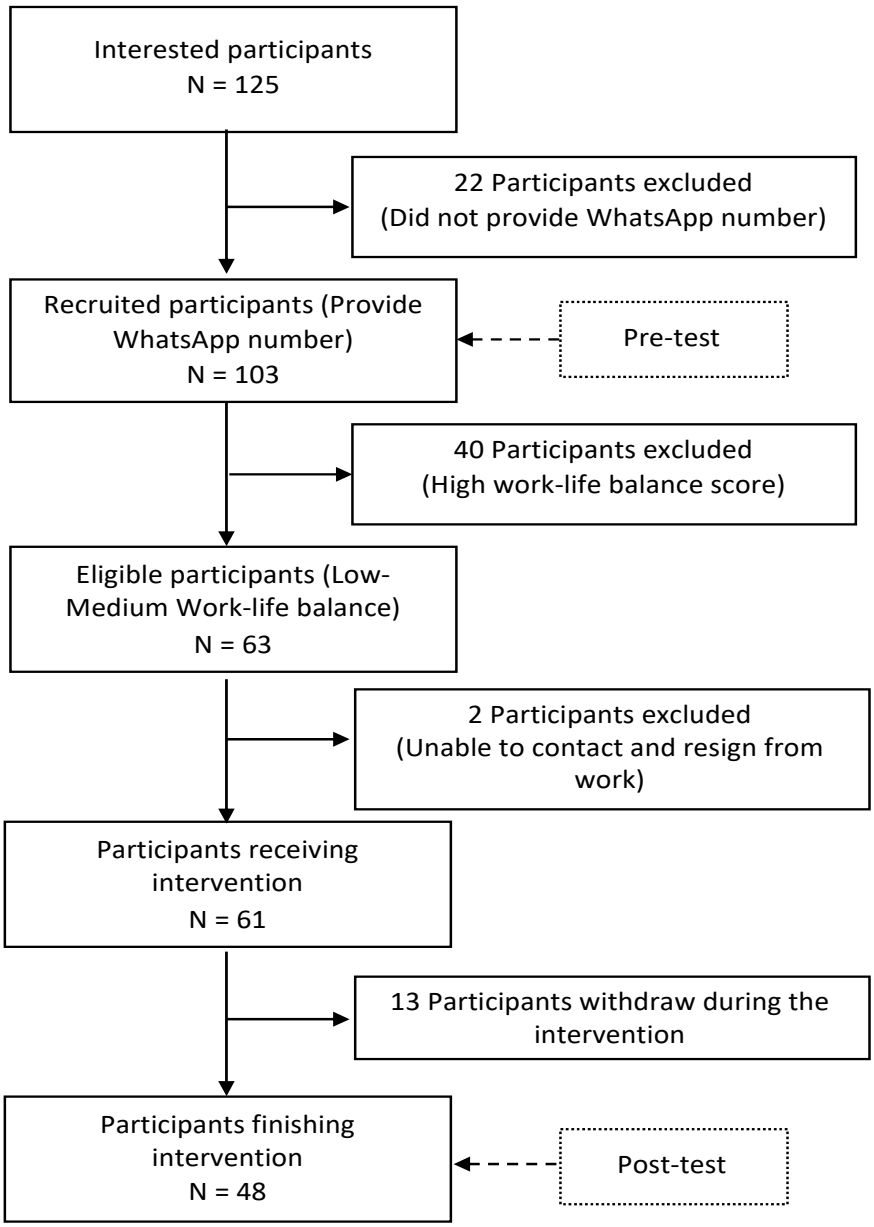
The demographic information collected included age, sex, employment status, residence status, occupation, educational background, marital status, and income. A work-life balance test developed by Fisher [40] was used in this study. The scale consists of 17 items rated on a Likert scale (1 = strongly disagree to 5 = strongly agree) and includes two main dimensions of work-life balance (work demands and resources). The scale was translated into Indonesian and tested for validity. [41] We assessed participant's sleep quality using the Sleep Disturbance Scale. [40] This scale comprises eight items covering six individual sleep quality factors (daytime dysfunction, post-sleep restoration, sleep difficulties, difficulty waking, sleep satisfaction, and sleep quality). Each item was measured using four response ranges (0 = rarely, 1 = sometimes, 2 = often, and 3 = always). This scale has been adapted into Indonesian and showed good validity and reliability 38. At the end, we used five short questions in an open-ended format to evaluate participants' satisfaction and acceptability.

RESULTS

DESCRIPTIVE

A total of 125 people responded to the email and social media advertisements. Of these, 22 were excluded because they were unable to provide WhatsApp numbers for the study. The remaining 103 individuals completed the pretest assessment; however, only 61 met the inclusion criteria. Prospective participants were contacted via text messages to confirm their participation in the intervention. The participation attrition rate was 82%; 48 of 61 confirmed participants completed the study, which was defined as receiving all messages and completing the post-test at the end of the intervention (see Figure 1 for details). This number was deemed appropriate for pilot study design [49].

FIGURE 1. PARTICIPANT RECRUITMENT PROCESS



Descriptive statistics were calculated for the 48 study participants (see Table 1).

TABLE 1. DESCRIPTIONS OF STUDY PARTICIPANT CHARACTERTISTICS

Characteristic	Distribution *n* (%)
Gender	
Female	35 (73 %)
Male	15 (27 %)
Age group	
Young adult (20-30 years old)	39 (81%)
Middle adult (31-40 years old)	7 (14%)
Late adult (41 - 50 years old)	2 (5%)
Marital status	
Married	11 (27%)
Not married	37 (73%)
Highest education	
Senior high school	9 (18%)
Undergraduate	33 (72%)
Post-graduate	6 (10%)
Monthly income (in IDR)	
< 1.5 million	8 (17%)
1.5 – 3.5 million	4 (8%)
3.5 – 7 million	24 (50%)
7 – 10 million	10 (21%)
> 10 million	2 (4%)
Employee status	
Full-time	37 (77%)
Freelance	11 (23%)

HYPOTHESIS TESTING RESULTS

Preliminary analysis showed data met the normality assumption (Shapiro-Wilk test > .05). Paired sample t-test analysis revealed that there was no significant difference in work-life balance scores between the pre-test and post-test sessions (t (47) = - 1.75, p >.05; 95%CI [-.54, .03]. Inspection of the results suggested that, although there was a slight increase in scores in the post-test (M = 54.69; SD = 8.81) compared to the pre-test (M = 50.5; SD = 9.51), this increment was small (Cohen's d = .253). Nevertheless, our t-test results indicated a significant difference in sleep quality before and after the program (t (47) = − 2.85, p <.05; 95%CI [-.70, -.11] with a moderate effect size (Cohen's d = .411). This means that there was a statistically significant increase in sleep quality scores before the intervention (M = 22.29; SD = 6.79) compared with scores after the intervention (M = 25.73, SD = 4.58) (see Figure 2).

FIGURE 2. WORK-LIFE BALANCE (LEFT) AND SLEEP QUALITY (RIGHT) SCORES PLOT ON PRE AND POST INTERVENTION

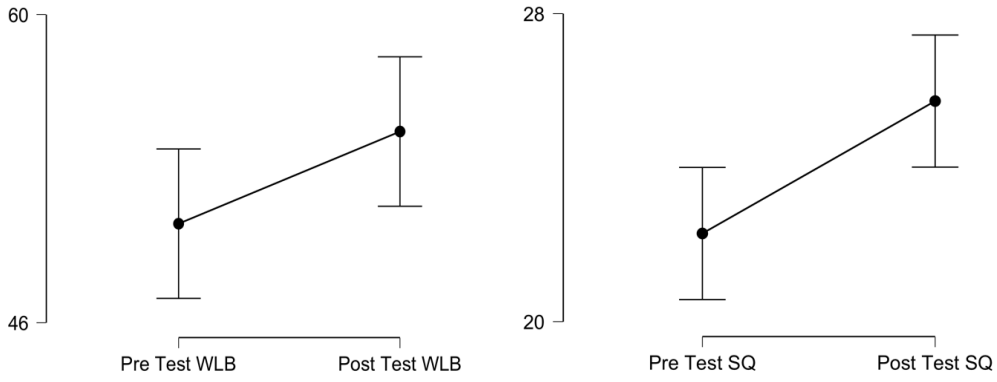


TABLE 2. SATISFACTION AND ACCEPTABILITY MEASURES

Questions (N = 48)	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Are you satisfied with the program?	0	0	12.5% (*n* = 6)	52% (*n* = 25)	35.5% (*n* = 17)
Do you want to keep receiving the messages?	2% (*n* = 1)	17% (*n* = 8)	46 % (*n* = 22)	17 % (*n* = 8)	18 % (*n* = 9)
Do you want to recommend this program to others?	0	2% (*n* = 1)	41% (*n* = 20)	34% (*n* = 16)	23% (*n* = 11)

A total of 87.5% of participants were reported to be satisfied with the program, and 58% suggested intervention for others. Most participants found that the program was helpful in giving prompts for self-reflection and reminders to maintain their sleep quality and work-life balance. Regardless of the advantages, several participants mentioned that they did not have time to read every message received. It is only approximately 35% of the respondents indicated an intention to continue receiving messages (see Table 2).

DISCUSSIONS

Although there was an improvement in work-life balance scores from pre- to post-intervention, this study indicates that the increment was not significant. Nevertheless, participants' sleep quality increased significantly from pre- to post-intervention. This significant result implies that a combination of positive message delivery and daily sleep monitoring messages may help enhance participants' awareness and attentiveness to maintain a healthier sleep schedule.

Our data indicated that some participants missed messages because of a backlog of unread messages. It is possible that the messages were too generic and only received fleeting attention. Previous studies suggest that in a randomized control trial, personalized text messages would contribute to the effectiveness of the intervention by increasing participant retention. [47] Scholars have asserted that tailored messages might be created by including participants' personal information, such as name, age, and gender in the text 43. Meanwhile, the sleep reminder feature may have a stronger influence on participants' awareness of managing their time compared to text messages. It is therefore important to note that the non-significant results in the work-life balance feature might also be attributed to a ceiling effect resulting from mixing the messages with the daily sleep monitor. Future studies should investigate this relationship to ascertain whether similar results would occur in different samples.

Another potential problem may lie in the sociocultural context. While previous studies have demonstrated the effectiveness of text-based interventions in Asian populations [37,41], caution should be exercised when implementing online-based psychological interventions in diverse sociocultural settings. [43] In collectivist cultures such as Indonesia, where social bonds are often expressed physically, working is more than just getting a job. A job is a reflection of an individual's social identity. [46] Wearing a uniform, commuting to an office building, and sharing a workplace are all connected to social status and identity. Nevertheless, through this study, we have been able verified that the use of text-based technology to deliver mental health services in Indonesia is promising. The evaluation part is a unique strength of this preliminary study because research on the development of digital technologies for mental health purposes during pandemics in Indonesia is limited.

This pre-experimental study has certain limitations. First, to maintain intervention efficacy, the inclusion criteria of this study should have considered participants' familiarity with mobile phone technology. Second, we may need to enhance participants' engagement by providing them with a tailored message, which would be beneficial in managing participants' retention in the intervention. Third, the sample size of this study was relatively small and most of the participants came from the unmarried young adult

group, which may mean that they had fewer social/familial burdens relative to the married and older adult groups. Suggestions for future studies include a recommendation for a possible randomized control design (RCT) study that allows for a recall test as part of the manipulation check. Subsequently, a close examination of the timing variance, frequency, and number of text messages sent to participants each day may help identify potentially confounding variables as well as needs to include a larger sample size.

CONCULSIONS

Despite the statistically non-significant results, our pilot study concluded that text message prompts are promising. Recommendations for further analysis involving participants' personal characteristics and tailored messages are critical parts of the current study and must be cautiously considered. One of the most important takeaways of this study is that the sociocultural context of how the intervention is provided may aid mental health professionals in increasing its efficacy.

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CONFLICT OF INTEREST DECLARATION:

The authors declare that they have no affiliations with or involvement in any organization or business entity with any financial interest in the subject matter or materials discussed in this manuscript.

AUTHOR CONTRIBUTIONS:

HM and FHA contributed to the design and implementation of the research, HM and E contributed to the analysis of the results and to the writing of the manuscript. LY and BT conceived and supervised the study.

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