Development of an Online-Coaching Blended Couple-Oriented Intervention for Preventing Depression in Middle Adulthood: An Intervention Mapping Study

Suk-Sun Kim¹, Minji Gil²* and Daeun Kim²

¹ Ewha Research Institute of Nursing Science, College of Nursing, Ewha Womans University, Seoul, South Korea, ² College of Nursing, Ewha Womans University, Seoul, South Korea

Background: Although middle-aged adults in Korea are vulnerable to depression, there are few preventive interventions for depression in middle adulthood. Studies consistently suggest that interventions that include both spouses are effective in decreasing depression and relationship distress. Considering the busy lives of middle-aged couples, it is essential to develop an online-coaching blended couple-oriented intervention. This study aimed to describe the development, implementation, and evaluation of an online-coaching blended couple-oriented intervention using an online program and coaching via videoconference to prevent middle-aged couples’ depression; this was done using an intervention mapping (IM) protocol.

Methods: Six steps of IM were used to systematically develop a tailored multi-level intervention specific to middle-aged couples’ depression. These steps of the IM protocol involve needs assessment, formulation of change objectives, theory-based methods, and practical strategies for program design, program development, program implementation, and program evaluation.

Results: The results of the six steps were as follows: (a) middle-aged couples’ needs and mental health problems were identified through a scoping review study, mixed-method study, and expert interviews; (b) six performance objectives (POs) were formulated based on the results of Step 1, and intrapersonal, interpersonal, and temporal/transpersonal determinants were identified based on the self-transcendence theory. Change objectives were developed by combining POs with determinants; (c) self-regulated learning was chosen for theoretical teaching methods and practical strategies to change the determinants of each level; (d) four modules consisting of 16 sessions were developed based on the self-transcendence theory; (e) experts evaluated the program and coaches were trained; and (f) the evaluation plan for the program’s feasibility, acceptability, usability, and preliminary effects was developed.

Discussion: The systematic process using IM allowed us to develop an online-coaching blended couple-oriented intervention to prevent depression and promote couples’
relationships. The primary effects of this newly developed program should be evaluated in future studies. This may lead to the increased adoption and implementation of evidence-based and tailored interventions for psychological wellbeing in middle adulthood.

**Keywords:** intervention mapping, program development, online intervention, couples therapy, primary prevention, depression, middle aged adult

---

**INTRODUCTION**

Depression is a common mental disorder that contributes to the overall global disease burden (1, 2). There is growing concern about the increasing prevalence of depression among middle-aged Koreans (3). The prevalence of depression in middle-aged adults has gradually increased from ~220,000 people in 2016 to 250,000 people in 2020 (4).

Many studies have identified the risk factors for middle-aged depression, including retirement, economic insecurity, changes in family structure, empty-nest syndrome, declining health, hormonal changes, sexual dysfunction, loneliness, and loss of social capital (5, 6). Previous research suggests that chronic exposure to risk factors makes middle-aged adults more vulnerable to depression (6). Because middle-aged adults in Korea often remain undetected and untreated despite their vulnerability to depression (3), it is important that preventive interventions for depression are tailored for a particular target group.

Couple-oriented interventions, targeting couple relationships, involved both spouses of committed relationships in conjoint sessions (7). Compared with individual-oriented interventions for depression focusing on individual cognitive and behavioral changes, couple-oriented interventions appeared more effective in improving depressive symptoms and enhancing couple relationships regardless of the degree of distress (7).

Common couple-oriented interventions for depression include traditional behavioral couple therapy (8), cognitive-behavioral couple therapy (9, 10), and emotionally focused couple therapy (11). However, recent research has emphasized that the integration of cognitive-behavioral couple therapy with communication, problem-solving training, and emotional acceptance is more effective in reducing depression and improving couple relationships (12, 13). Moreover, the development of integrated couple-oriented interventions is required to reflect the mental health needs of vulnerable populations across life stages, particularly in middle adulthood.

Furthermore, to increase the reach of couple-oriented interventions, researchers have developed blended interventions that combine both online self-help approaches, such as digital video lessons and practical materials, and online coaching approaches, such as phone calls and videoconferences with psychologists (12, 13). Blended interventions can reach more couples than traditional therapy due to reduced financial costs, time, and geographic restrictions (13, 14). Considering the busy lives of middle-aged couples and the COVID-19 pandemic era (15, 16), it is vital to develop a blended couple-oriented intervention adapted to an online self-help program with coach support to prevent depression and promote couple relationships.

This study describes the development of an online-coaching blended couple-oriented intervention using an online program and coaching for middle-aged couples’ depression by applying intervention mapping (IM). The systematic planning protocol of IM has been widely used by many researchers to develop mental health programs (17), such as art therapy programs for patients with personality disorders (18), media smoking prevention programs for female high school students (19), and mental health education programs for pharmacy staff (20). However, to date, there have been few interventions applying the IM protocol to develop tailored interventions for middle-aged couples’ depression. Therefore, the purpose of this study was to describe the development, implementation, and evaluation of an online-coaching blended couple-oriented intervention using an online program and coaching to prevent depression in middle-aged couples.

**METHODS**

Intervention mapping provides guidelines for systematically developing, implementing, and evaluating new programs based on a foundation of theory, empirical evidence, and the needs of the target population (16). The process of program planning of IM includes six steps: (a) identifying needs or health problems by conducting needs assessment; (b) creating a matrix of change objectives by combining performance objectives with determinants; (c) choosing theoretical methods and translating these into practical strategies or applications; (d) generating a program including scope and sequence of the components of the intervention and preparing program materials and protocols; (e) planning the adoption and implementation of the program; and (f) planning the evaluation of the newly developed program and its implementation.

This study focuses mainly on the results of steps 1–4 regarding the development of a new online-coaching blended couple-oriented intervention using an online program and coaching via videoconference, called the MindGuide Couple program. This study was approved by the Institutional Review Board of Ewha Womans University.

**RESULTS**

**Step 1. Needs Assessment**

To identify middle-aged couples’ needs regarding the prevention of depression and promotion of psychological wellbeing, we conducted a needs assessment by integrating a scoping review, mixed-method study, and expert interviews.
Scoping Review
We systematically reviewed the characteristics, content, theory, and outcomes of couple-oriented interventions for both mental health promotion and the primary prevention of mental disorders. The protocol for this scoping review has been previously published (21). The results of the scoping review showed that couple-oriented interventions were classified as cognitive-focused (e.g., cognitive existential couple therapy), behavior-focused (e.g., integrative behavioral couple therapy), emotional-focused (e.g., emotionally focused couple therapy), communication-focused (e.g., couple-based supportive communication), and relationship-focused (e.g., couple and relationship education). These interventions targeted cancer patients and their spouses, couples with a specific problem (e.g., chronic pain, HIV, alcohol problems, relationship distress, and low income), and couples over the age of 18 years. However, interventions targeting specific age groups (e.g., young, middle-aged, and older couples) have not been found. Considering the high risk of middle-aged depression in South Korea, couple-oriented interventions to prevent depression in middle adulthood need to be developed.

Moreover, most interventions were conducted in the U.S.A. and delivered face-to-face. These findings indicate that there is a need to develop culturally tailored interventions for Asians and transition from face-to-face to online or blended interventions, considering the COVID-19 pandemic.

Need Assessment of Middle-Aged Couples
To determine and prioritize educational needs to promote middle-aged couples' psychological wellbeing, an exploratory sequential mixed-method study was conducted.

First, a qualitative study was conducted through couple interviews with 14 middle-aged couples who were recruited using the snowball sampling method. Open-ended questions regarding the experience of psychological wellbeing were asked, such as “What psychological wellbeing do you experience in middle adulthood?” and “Could you describe what is needed to improve your or your spouse's psychological wellbeing?” Three major themes were identified: (a) confronting vulnerability to mental health problems; (b) navigating life's journey together; and (c) progressing toward self-transcendence. Middle-aged couples were aware of the importance of mental health in middle adulthood while experiencing a midlife crisis as they aged. They overcame the midlife crisis by forming a We-ness in which couples have a depth of connection and support each other. Moreover, they moved toward self-transcendence based on the expansion of relationships with the self, others, environments, and a higher being.

Second, a self-administered questionnaire was developed based on the qualitative results and a literature review. The questionnaire included six competencies of psychological wellbeing: mental health, emotional regulation, spirituality, couple communication, and couple relationships, as well as barriers and facilitators of the couple-oriented intervention. Overall, 234 middle-aged adults were recruited via advertisements on several social media platforms. The inclusion criteria were as follows: (a) 40–65 years of age; and (b) individuals in a committed relationship. The Borich Needs Assessment Model compared differences between participants' perceptions of the importance of competencies regarding psychological wellbeing and their ability to perform these competencies. The priority needs found as follows: (a) couple communication issues (i.e., continuous communication, speaking, and listening); (b) mental health issues (i.e., stress, depression, anxiety, and suicide); (c) emotional issues (recognizing accepting and expressing emotions); (d) couple relationship issues (i.e., conflict, understanding the spouse, and leisure with the spouse); (f) change in middle age issues (i.e., role change, physical and psychological change); and (e) spirituality issues (i.e., meaning in life, altruistic life, and self-integration). In addition, 80.3% of the participants answered that couple-oriented intervention was necessary, but 91.9% did not participate because they were too busy and did not have enough time in their schedule.

Finally, the integrated results of the qualitative and quantitative study indicated that middle-aged couples could progress toward self-transcendence by expanding multidimensional boundaries in order to overcome vulnerabilities to depression. In addition, couple-oriented interventions for preventing depression should teach effective communication skills to help participants express emotions and thoughts to their spouses, which leads to the formation of We-ness in couples and promotes psychological wellbeing. The detailed results of this study have been previously reported in Korea (22).

Expert Interview
The expert interview was conducted with eight marriage and family therapists, including a psychiatrist, two psychiatric mental health nurses, and five psychologists. They had worked as marriage and family therapists for 8–30 years. Weekly counseling sessions have been reported to range between 1 and 20. Semi-structured interview questions included (a) reasons to start couple therapy; (b) benefits of couple therapy; (c) preferred techniques; and (d) the roles of couple therapists. They engaged in interviews at their workplace or over the phone for a duration of 45–73 min. The qualitative text analysis software MAXQDA was used to code and analyze the data using content analysis.

First, most therapists stated that couples received couple therapy for relationship distress. Couples with distress believe that relationship problems are caused by personal differences. However, therapists noted that weak management of couple conflict might lead to relationship problems, as well as poor mental health issues, such as depression.

Second, therapists said that couple therapy focuses on strengthening couples’ relationships by equipping them with communication and problem-solving skills. Couple therapy helped couples to understand each other better and improve attachment and bonding with the spouse, which built more resilient relationships. Relational resilience can play a protective role in promoting mental health.

Third, the experts reported that integrative techniques from different therapies were used depending on clients’ needs or
problems since integrative techniques provide flexibility in couple therapy and offer the opportunity to improve the efficacy of therapy. They used a family tree, imago conversation, healing inner child, mindfulness, cognitive restructuring, role-playing, and a gratitude diary. Moreover, they highlighted the importance of combining individual and conjoint sessions with one therapist in all sessions. As marriage problems are prone to be interactive, for one spouse to make a change for the better, both spouses need to work together.

Fourth, therapists emphasized that building a solid therapeutic alliance with a couple is a critical component of successful couple therapy. They also said that the primary role of a couple therapist is as a facilitator who helps couples strengthen relationships by understanding the spouse better and focusing on the strengths of a couple. They helped a couple enhance the emotional bond between spouses by caring about each other and navigating and resolving conflicts effectively.

**Integrated Results**

Based on the integrated findings from the scoping review, mixed-method study, and expert interviews, the research team discussed and identified the target population, purpose of the intervention, delivery method, and techniques. First, we found that it is necessary to develop a couple-oriented intervention targeting middle-aged couples’ depression because they are at a higher risk of depression (3, 4), and their negative relationship influences depression. Second, the integrated results suggest that increased self-transcendence might promote psychological wellbeing and prevent depression. Hence, the goal of the intervention is to expand self-boundaries multidimensionally, according to the self-transcendence theory (23). Third, considering the busy lives of middle-aged couples, an online-coaching blended couple-oriented interventions using an online program and coaching should be developed to meet their needs. Finally, the findings highlight that integrating techniques in line with Korean culture increased the effectiveness of couple-oriented interventions for depression in couple relationships.

**Step 2. Formulation of Change Objectives**

Performance objectives (POs) were formulated to develop a new tailored intervention for preventing mental disorders, such as depression, and enhancing couple satisfaction for middle-aged couples based on the integrated results of step 1. POs are more specific than the traditional goal of a program because their statements include those who need to change and what needs to be changed (17).

A matrix of change objectives (COs) was developed by combining POs with determinants (Table 1). We selected intrapersonal, interpersonal, and temporal/transpersonal determinants derived from the self-transcendence theory (23). To prevent depression and enhance couple satisfaction for middle-aged couples by expanding boundaries, the intervention should increase knowledge, attitudes, and skills at an intrapersonal level, as well as relationship functioning at an interpersonal level and shared outcomes at a temporal/transpersonal level. Finally, we identified 32 COs that indicated the intervention.

**Step 3. Theory-Based Method and Practical Strategies for Program Design**

Based on the results from steps 1 and 2, we developed an online-coaching blended couple-oriented intervention. We selected self-regulated learning (SRL) based on social cognitive theory for theoretical teaching methods and practical strategies to change the determinants of each level because it is widely used in blended programs (24, 25).

We developed a blended intervention that incorporated both online programs and coaching via videoconference. An online-coaching blended couple-oriented intervention provides opportunities to apply effective methods in an innovative manner. It also allows couples to manage and control their learning activities at their pace and receive real-time mental health care as per their convenience and time. In this blended intervention, we used methods of organization, rehearsal, elaboration, record keeping, and monitoring to improve knowledge, attitude, and skills at the intrapersonal level. In addition, reflective dialogue and performance feedback were applied to increase relationship functioning and shared outcomes at interpersonal and temporal/transpersonal levels, respectively. These methods have been translated into practical strategies. The organization method was utilized to structure video lectures, such as learning objectives, case studies, and summaries of the main points. For rehearsal, we provided audio and video materials on mobile and web-based platforms to watch the videos repeatedly. We applied the method of elaboration to connect new things and prior knowledge by answering guided questions such as, “Describe your own situation relevant to the learning contents.”

Record keeping and monitoring were used to monitor their thinking and behavior to modify their behaviors. We encouraged couples to apply what they had learned in their lives and to write about their thoughts, emotions, and experiences on the mobile and web-based platforms. In conjoint sessions, we encouraged couples to share their writing with their spouses and complete tasks together.

For reflective dialogue and performance feedback, the coach started the sessions with quick reminders of the objectives and activities of the sessions to reflect on what they learned, and which of the activities helped them. In addition, the coach provided tailored feedback by analyzing their written responses to tasks.

**Step 4. Program Development**

The self-transcendence theory was selected as the theoretical framework to develop the MindGuide Couple program (Figure 1), which was designed to expand one’s personal boundaries multidimensionally (i.e., at the intrapersonal, interpersonal, temporal, and transpersonal levels) to achieve POs.

For the enlargement of intrapersonal boundaries, Modules 1 and 2 were composed of new positive coping mechanisms, such as mindfulness (26) and gratitude journaling (27), to strengthen inner resources and a holistic understanding of their thoughts, emotions, and inner child to increase self-awareness. To extend the interpersonal boundaries, Module 3 focused on building a
TABLE 1 | Matrix of change objectives for MindGuide Couple Program.

| Performance objectives | Intrapersonal determinants | Interpersonal determinants | Temporal/transpersonal determinants | Shared outcome |
|-------------------------|----------------------------|-----------------------------|-------------------------------------|----------------|
|                         | Knowledge                  | Attitude                    | Skill                              | Relationship functioning |
| PO1. Understanding mental health issues in middle adulthood | K1a. Understanding vulnerability to depression in middle adulthood | A1a. Having positive attitude toward program | S1a. Performing a screening for depression | R1a. Recognizing depression in spouse |
|                         | K1b. Describing depressive symptoms | A1b. Having empathy for people with depression or mental disorder | | |
|                         | K1c. Learning about the key suicide signs and warnings | | | |
| PO2. Trying coping strategies for preventing depression | K2a. Knowing about healthy coping techniques | A2a. Getting motivated through the perceived benefits of healthy coping techniques | S2a. Developing healthy coping techniques | R3a. Recognizing you and your partner’s differences |
| PO3. Becoming more self-aware | K3a. Being aware of emotion, thought, and behavior | A3a. Cultivating a positive perspective in life through reflecting on the past | S3a. Managing the emotion, thought, and behavior effectively | |
| PO4. Building a healthy communication in couple relationships | K4a. Understanding positive and negative communication style | A4a. Communicating respectfully with your spouse | S4a. Sharing your needs and feelings in a respectful way | R4a. Understanding more deeply your spouse R4b. Becoming aware of your own communication style as well as your partner’s communication style. R4c. Building empathy and improving communication skill |
| PO5. Making the therapeutic alliance in couple | K5a. Understanding your personal values and life meaning | A5a. Being strong and moving forward with a positive attitude | | R5a. Helping your spouse heal their emotional wounds R5b. Showing respect to your partner R5c. Providing emotional support R5d. Remembering you love each other |
| PO6. Rebuilding life’s meaning | K6a. Understanding your personal values and life meaning | A6a. Being strong and moving forward with a positive attitude | | R6a. Making blueprint together as a couple |

healthy relationship with the spouse by training effective couples’ communication skills and committing to practicing the spouse’s love languages. Module 4 was designed to expand boundaries at the temporal and transpersonal levels by integrating the past, present, and future and to connect with a higher being.

Modules 1 and 2 were designed as individual sessions, in which each spouse worked separately. Modules 3 and 4 were planned as conjoint sessions, wherein couples completed structured interaction tasks. The four modules consisted of 16 sessions that provided integrative techniques from different therapies to accomplish POs (Table 2). Each session took about 20–30 min to complete, depending on the individual learning abilities. Videoconference calls with a professional coach were planned to support couples at the end of each module. Coaches helped couples apply program content, reinforce relationships, and improve communication for 1 h.

The MindGuide Couple program was developed through collaboration with interdisciplinary teams of one researcher, two psychiatric mental health nurse practitioners, one marriage and family therapist, one web designer, and two technical
It was delivered online via mobile and web-based platforms and was divided into two pages: a user service page and an administrator dashboard. The user service pages contained (a) the MindGuide Couple program; (b) a gratitude journal; (c) mindfulness; (d) emotion cards, and (e) a discussion board. On the page of the MindGuide Couple program, participants engaged in the program and viewed their spouses’ progress. In gratitude journal pages, participants wrote about one thing they were grateful for in a day. This journal was intended to help participants focus on emotional experiences. Participants could choose whether to disclose their journals to their spouses. Those desiring privacy could restrict access to the journals themselves. The administrator dashboard provides convenient management tools for the research team to organize and manage the web usage data. The MindGuide Couple program was developed and provided via mobile and web-based platforms (Figure 2).

Content Validation
Two couple and family therapists (CFTs), and three psychiatric mental-health nurse practitioners (PMHNPs) with practical experience in couple counseling and therapy evaluated the content validity of the program. The panel group was different from the experts in step 1. The content validity index (CVI) of a program is defined as the extent to which program components are relevant to the program goal and effectiveness in a target population (28). We developed 10 items of the assessment instrument for the CVI based on previous studies regarding the blended learning approach, program components and sequence, techniques, session length and frequency, and program outcomes.

**FIGURE 1 |** Theoretical framework of the self-transcendence theory.
| Theme of module | PO   | CO       | Session | Online lectures | Tasks                  | Coaching                                                      |
|----------------|------|----------|---------|----------------|------------------------|---------------------------------------------------------------|
| Intrapersonal  | PO1  | A1a      | 1       | Introduction to the program | Mindfulness            | Making couples set their goals                                |
|                | PO2  | K2a, A2a, S2a | 2       | Learn the mindfulness and gratitude journal | Writing a gratitude journal | Focusing on the present and future                            |
|                | PO3  | K1a, K1b, K1c, A1b, R1a | 3       | Learn how to prevent depression and suicide | Mindfulness             | Helping couples perceive where they currently stand in their life |
|                |      | A3a      | 4       | Life map         | Mindfulness             | Motivating couples with the required encouragement and support |
|                |      |          |         |                 |                        | Helping couples understand how their minds operate differently |
|                |      |          |         |                 |                        | Encouraging couples to be more self-aware                     |
|                |      |          |         |                 |                        | Supporting to become a better person for their spouse         |
|                |      |          |         |                 |                        | Trying to ensure the couple's progress                        |
| Intrapersonal  | PO2  | K2a, A4a | 5       | Discovering my true self | Mindfulness            |                                                                 |
|                | PO3  | K3a, S3a | 6       | Exploring my inner self | Mindfulness            | Accepting yourself and your spouse's personality and characteristics differences |
|                | PO4  | K3a, A2a, S2a, S3a | 7       | Inner child      | Mindfulness            |                                                                 |
|                |      |          |         |                 |                        | Supporting during couples' communication                      |
| Interpersonal  | PO4  | K4a, K4b, K4c | 8       | Communication style | Mindfulness            | Identifying a better way for couple relationship               |
|                | PO5  | K4a, K4b, K4c | 9       | Discover negative patterns of communication | Mindfulness            |                                                                 |
|                |      |           |         |                 |                        | Supporting the couple understand each other better              |
|                |      |           |         |                 |                        | Making couples act towards what they want for a better relationship |
|                |      |           |         |                 |                        | Focusing on motivating couples toward a positive transition     |
|                |      |           |         |                 |                        | Restoring the couple relationship back to a balanced one       |
|                |      |           |         |                 |                        | (Continued)                                                    |
### TABLE 2: Continued

| Theme of module | PO   | CO               | Session | Online lectures | Tasks                                                                 | Coaching                                                                 |
|-----------------|------|------------------|---------|----------------|----------------------------------------------------------------------|--------------------------------------------------------------------------|
| Interpersonal   | PO6  | K6a, A6a, R6a    | 14      | To find values  | Mindfulness                                                           | Communicating in a way that leads to deep understanding and shared meaning |
|                 |      | A6a, S6a, R6a    | 15      | Building a healthy relationship | Mindfulness                                                           | Helping couples obtain relational oneness                                |
|                 |      | S6a, SO6a, SO6b  | 16      | Finding happiness as a couple | Mindfulness                                                           | Focusing on planning the couple's future                                  |

Steps 5 and 6. Designing a Program Implementation and Evaluation Plan

Coaching Training

Three coaches, one couple therapist, and two mental health nurses were trained in the coaching sessions. They held weekly training, practiced the program, and then evaluated the CVI using a four-point Likert Scale ranging from 1 (not valid at all) to 4 (very valid). The CVI result was 1.0, indicating that the program had acceptable CVI values (30). Each member of the panel took an overall look at the program individually and provided feedback. Moreover, the panel group held videoconference meetings to generate consensus between different opinions.
DISCUSSION

We described the development, implementation, and evaluation of an online-coaching blended couple-oriented intervention using an online program and coaching, called the MindGuide Couple program using IM. The IM approach appears useful in developing this tailored intervention that is specific to middle-aged couples’ mental health. As aging enhances emotional sensitivity to stress, middle-aged adults are vulnerable to depression (3, 38). Furthermore, depression in mid-life increases the risk of dementia in late-life (39). Thus, preventing mid-life depressive symptoms is essential for improving the quality of life in older adults. In particular, because relationship distress in couples is associated with a higher risk of depression (8), couple-oriented interventions may provide the opportunity for middle-aged couples to prevent depression and promote couple relationships as well.

The MindGuide Couple program was developed by conducting a scoping review, a quantitative Borich’s Needs Assessment of middle-aged couples, and an Integrative Needs Assessment process, including qualitative couple interviews with regard to couple-oriented intervention and expert interviews. Fernandez et al. (40) highlighted the need for the identification of multiple target adopters and implementers to develop a multi-level intervention. Consistent with this suggestion, we used couple interviews (41, 42) to collect data at both the individual and couple level. In addition, interpretative phenomenological analysis (42) was used to assess both the individuals’ and couples’ needs by exploring not only personal experiences but also shared couples’ experiences of psychological problems in the context of interdependent relationships.

Another strength of this program is that it is structured around the self-transcendence theory, which is suitable for promoting middle-aged couples’ psychological wellbeing (43, 44). The program helps participants gradually expand self-boundaries in multidimensional ways, according to the program modules. For example, in Modules 1 and 2 of the program, participants learned intrapersonal skills, such as self-awareness, mindfulness, and gratitude journaling. To expand interpersonal boundaries by building a healthy relationship with the spouse, Module 3 provides opportunities for understanding their spouse’s emotions and needs, accepting the spouse’s inner child, and helping the spouse heal their inner child. Finally, in Module 4, they develop a couple’s mission, vision, and value statements together by integrating them with their past, present, and future.

The distinctive strength of this online-coaching blended program is that it involves both flexible schedule online learning on mobile and web-based platforms, and vis-a-vis coaching using videoconference. Several researchers have suggested that online programs may provide opportunities for couples to overcome mental health stigma, lack of financial resources, and geographic barriers and to increase access to the program (45, 46). In addition, considering the busy lives of middle-aged couples, this online-coaching blended MindGuide Couple program allows them to participate in the program from any place when they have time and energy. Moreover, this blended couple-oriented intervention with coaching can enhance and expand couple-oriented interventions to facilitate real-time interaction between a couple and coach (45).

In this study, the program was developed with a target population of middle-aged couples, marriage, and family therapists, and a literature review was conducted. However, further research is needed to evaluate the feasibility, acceptability, and preliminary effects of the MindGuide Couple program on mental health (e.g., depression and anxiety) and couple relationships (e.g., couple satisfaction). Another limitation of this study is that the program was developed at both the individual and couple levels; however, family and community levels also need to be considered when developing multi-level interventions.

CONCLUSION

This article provides a detailed description of how we systematically developed an online-coaching blended couple-oriented intervention for preventing depression and promoting couple relationships based on IM. The IM allowed us to develop a tailored multi-level intervention based on the needs of middle-aged couples. This newly developed online-coaching blended couple-oriented intervention may provide opportunities for couples to overcome mental health stigma and enhance real-time interaction between a couple and a coach. The primary
effects of this newly developed program should be evaluated in future studies.

DATA AVAILABILITY STATEMENT
The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT
The studies involving human participants were reviewed and approved by Institutional Review Board of Ewha Womans University. The participants provided their written informed consent to participate in this study.

REFERENCES

1. Ferrari AJ, Somerville AJ, Baxter AJ, Norman R, Patten SB, Vos T, et al. Global variation in the prevalence and incidence of major depressive disorder: a systematic review of the epidemiological literature. *Psychol Med*. (2013) 43:471–81. doi: 10.1017/S0033291712001511
2. World Health Organization. *Depression*. (2022). Available online at: https://www.who.int/news-room/fact-sheets/detail/depression (accessed February 20, 2022).
3. Shin C, Kim Y, Park S, Yoon S, Ko YH, Kim YK, et al. Prevalence and associated factors of depression in general population of Korea: results from the Korean National Health and Nutrition Examination Survey, 2014. *J Korean Med Sci*. (2017) 32:1861–9. doi: 10.3346/jkms.2017.32.11.1861
4. Health Insurance Review & Assessment Service. Open-source Big Data About Medical Health Services. (2022). Available online at: http://openidata.hira.or.kr/op/ocp/all/MfrmNtrlslnsInfo.do (accessed February 20, 2022).
5. Gondek D, Moltrecht B, Ploubidis G. Mental health crisis in midlife—a proposed research agenda. *Res Ideas Outcomes*. (2021) 7:e62024. doi: 10.3897/rio.7.e62024
6. Chang HK. Influencing factors on mid-life crisis. *Korean J Adult Nurs*. (2018) 30:98–105. doi: 10.7475/kjan.2018.30.1.98
7. Barbato A, D’Avanzo B, Parabiagi A. Couple therapy for depression. *Cochrane Database Syst Rev*. (2018) 6:CD004188. doi: 10.1002/14651858.CD004188.pub3
8. Baucom DH, Fischer MS, Worrell M, Corrie S, Belu JM, Molyva E, et al. Couple-based intervention for depression: an effectiveness study in the National Health Service in England. *Fam Process*. (2018) 57:275–92. doi: 10.1111/fam.12332
9. Epstein NB, Zheng L. Cognitive-behavioral couple therapy. *Carr Opin Psychol*. (2017) 13:142–7. doi: 10.1016/j.copysc.2016.09.004
10. Moorey S, Hollon SD. Cognitive behavioral therapy for depression. *Oxf Res Encycl Psychol*. (2021) 1–23. doi: 10.1093/acrefore/9780190236557.013.837
11. Wittenborn AK, Liu T, Ridenour TA, Lachman EM, Mitchell EA, Seedall RB. Randomized controlled trial of emotionally focused couple therapy compared to treatment as usual for depression: outcomes and mechanisms of change. *J Marital Fam Ther*. (2019) 45:395–409. doi: 10.1111/jmft.12350
12. Doss BD, Cicila LN, Georgia EJ, Roddy MK, Nowlan KM, Benson LA, et al. A randomized controlled trial of the web-based our relationship program: effects on relationship and individual functioning. *J Consult Clin Psychol*. (2016) 84:285–96. doi: 10.1037/ccp0000063
13. Doss BD, Roddy MK, Nowlan KM, Rothman K, Christensen A. Maintenance of gains in relationship and individual functioning following the online our relationship program. *Behav Ther*. (2019) 50:73–86. doi: 10.1016/j.beth.2018.03.011
14. Georgia EJ, Doss BD. Web-based couple interventions: do they have a future? *J Couple Relatsh Ther*. (2013) 12:168–85. doi: 10.1080/15532969.2013.779101

AUTHOR CONTRIBUTIONS
S-SK, MG, and DK: study and manuscript conceptualization. S-SK and MG: contributed to methods, and results. S-SK and DK: contributed to background and results. S-SK: contributed to discussion. All authors contributed to the article and approved the submitted version.

FUNDING
This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) (No. 2019R1H1A2039669, 2019R1A2C1087398, and 2022R1A2C2004867).

15. Singh J, Steele K, Singh L. Combining the best of online and face-to-face learning: hybrid and blended learning approach for COVID-19, post-vaccine, & post-pandemic world. *J Educ Technol Syst*. (2021) 50:140–71. doi: 10.1177/00472395211047865
16. Van den Broeck E, Poels K, Walrave M. Older and wiser? Facebook use, privacy concern, and privacy protection in the life stages of emerging, young, and middle adulthood. *Soc Media Soc*. (2015) 1:1–11. doi: 10.1177/2056305115616149
17. Bartholomew-Eldrege JK, Markham C, Ruiter RA, Fernandez ME, Kok G, Parcel G. Planning Health Promotion Programs: An Intervention Mapping Approach. 4th ed. San Francisco, CA: Jossey Bass (2016).
18. Haeyen S, Heijman J. Compassion focused art therapy for people diagnosed with a cluster B/C personality disorder: an intervention mapping study. *Arts Psychother*. (2020) 69:1–10. doi: 10.1016/j.artpsy.2020.101663
19. Kim S. Using intervention mapping to develop a media literacy-based smoking prevention program for female adolescents. *Int J Environ Res Public Health*. (2021) 18:1–11. doi: 10.3390/ijerph18126305
20. Wheeler A, Fowler J, Hattingh L. Using an intervention mapping framework to develop an online mental health continuing education program for pharmacy staff. *J Contin Educ Health Prof*. (2013) 33:258–66. doi: 10.1002/chp.21198
21. Kim SS, Kim D, Gil M, Lim B, De Gagne JC. Couple-or family-oriented interventions and outcomes for preventing mental health problems and promoting mental health: a scoping review protocol. *JBI Evid Synth*. (2021) 19:432–9. doi: 10.11124/JBIES-20-00087
22. Gil M, Kim S, Kim SS. Middle-aged couples educational needs for psychological wellbeing: a mixed method study. *Korean Acad Psychiatr Ment Health Nurs*. (2022) 31:1–15. doi: 10.12934/jkpmhn.2022.31.1.1
23. Reed PG. Theory of self-transcendence. In: Smith MJ, Liehr PB, editors. *Middle Range Theory for Nursing*. 3rd ed. New York, NY: Springer Publishing Company (2014). p. 109–39.
24. Anthonysamy L, Koo A, Hew SH. Self-regulated learning strategies in higher education: fostering digital literacy for sustainable lifelong learning. *J Educ Inf Technol*. (2020) 25:2393–414. doi: 10.1007/s10639-020-10134-2
25. Setyaningrum W. Self-regulated learning in blended learning approach. *J Phys Conf Ser*. (2019) 1320:1–6. doi: 10.1088/1742-6596/1320/1/012089
26. Winter F, Steffan A, Warth M, Ditzen B, Aguilar-Raab C. Mindfulness-based couple interventions: a systematic literature review. *Fam process*. (2021) 60:694–711. doi: 10.1111/famp.12683
27. Dixon MTS. The effect of gratitude journaling on conflict resolution in intimate dyadic relationships. *Philipp J Psychol*. (2020) 53:117–44. doi: 10.31710/pjp/0053.05
28. Gil M, Kim SS. Feasibility and preliminary efficacy of a new online self-help intervention for depression among Korean college students’ families. *Int J Environ Res Public Health*. (2022) 19:1–12. doi: 10.3390/ijerph19042142
29. Kassam-Adams N, Marsac ML, Kohser KL, Kenardy J, March S, Winston FK, et al. New method for assessing content validity in model-based creation and iteration of eHealth interventions. *J Med Internet Res*. (2015) 17:1–8. doi: 10.2196/jmir.3811
30. Yusoff MSB, ABC of content validation and content validity index calculation. *Resource*. (2019) 11:49–54. doi: 10.21315/eimj2019.11.2.6
31. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Meas*. (1977) 1:385–401. doi: 10.1177/01466216770100100306
32. Spitzer RL, Kroenke K, Williams JB. Patient Health Questionnaire Primary Care Study Group. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. *JAMA*. (1999) 282:1737–44. doi: 10.1001/jama.282.18.1737
33. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. (2006) 166:1092–7. doi: 10.1001/archinte.166.10.1092
34. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers Soc Psychol*. (1988) 54:1063–70. doi: 10.1037/0022-3514.54.6.1063
35. Funk JL, Rogge RD. Testing the ruler with item response theory: increasing precision of measurement for relationship satisfaction with the couples satisfaction index. *J Fam Psychol*. (2007) 21:572–83. doi: 10.1037/0893-3200.21.4.572
36. Kim SS, Gil M, Kim-Godwin Y. Development and validation of the family relationship assessment scale in Korean college students’ families. *Fam Process*. (2021) 60:586–601. doi: 10.1111/famp.12559
37. Diener ED, Emmons RA, Larsen RJ, Griffin S. The satisfaction with life scale. *J Pers Assess*. (1985) 49:71–5. doi: 10.1207/s15327752ja04901_13
38. Lee JE, Kwon HJ, Choi J, Seo JS, Han PL. Aging increases vulnerability to stress-induced depression via upregulation of NADPH oxidase in mice. *Commun Biol*. (2020) 3:1–15. doi: 10.1038/s42003-020-1010-5
39. Barnes DE, Yaffe K, Byers AL, McCormick M, Schaefer C, Whitmer RA. Midity vs. late-life depressive symptoms and risk of dementia: differential effects for Alzheimer’s disease and vascular dementia. *Arch Gen Psychiatry*. (2012) 69:493–8. doi: 10.1001/archgenpsychiatry.2011.1481
40. Fernandez ME, Ten Hoor GA, Van Lieshout S, Rodriguez SA, Beidas RS, Parcel G, et al. Implementation mapping: using intervention mapping to develop implementation strategies. *Front Public Health*. (2019) 7:1–15. doi: 10.3389/fpubh.2019.00158
41. Morgan DL, Ataie J, Carder P, Hoffman K. Introducing dyadic interviews as a method for collecting qualitative data. *Qual Health Res*. (2013) 23:1276–84. doi: 10.1177/1049732313501889
42. Tkachuk M, Russell-Mayhew S, Kassan A, Dimitropoulos G. Adapting descriptive psychological phenomenology to include dyadic interviews: practical considerations for data analysis. *Qual Rep*. (2019) 24:352–70. doi: 10.46743/2160-3715/2019.3406
43. Ellermann CR, Reed PG. Self-transcendence and depression in middle-age adults. *West J Nurs Res*. (2001) 23:696–713. doi: 10.1177/0193945012020 4592
44. Kim SS, Reed PG, Kang Y, Oh J. Translation and psychometric testing of the Korean versions of the spiritual perspective scale and the self-transcendence scale in Korean elders. *J Korean Acad Nurs*. (2012) 42:974–83. doi: 10.4040/jkan.2012.42.7.974
45. Doss BD, Feinberg LK, Rothman K, Roddy MK, Comer JS. Using technology to enhance and expand interventions for couples and families: conceptual and methodological considerations. *J Fam Psychol*. (2017) 31:983. doi: 10.1037/fam0000349
46. Wu MS, Chen SY, Wickham RE, O’Neil-Hart S, Chen C, Lungu A. Outcomes of a bended care coaching program for clients presenting with moderate levels of anxiety and depression: pragmatic retrospective study. *JMR Ment Health*. (2021) 8:1–10. doi: 10.2196/32100

**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

**Publisher's Note:** All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

**Copyright © 2022 Kim, Gil and Kim. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other formats is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.**