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Original Article

Effectiveness of a self-health management method using a smartphone application for menopausal women

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Key words
menopausal women, self-care, smartphone application, self-health control method

Abstract

【Aim】 The present study aimed to determine whether the use of smartphone applications dedicated to menopause effective and continuity for self-management of health.

【Methods】 Thirty-nine women aged 40–57 freely recorded their health condition by using the application for 2 months. Behavior modification before and after intervention, Simplified Menopausal Index (SMI), self-health evaluation score, and the continuity of the menopausal application were investigated.

【Results】 After use of the menopausal application, there was a significant difference in the behavior change stage of eating habits. In addition, the SMI of the group assessed as having menopausal symptoms decreased. The average number of days of input was 43.3 ± 18.1 days. In response to the menopausal application, the participants responded that it "helped them to know their own physical conditions" (64.1%) and "can be used for taking care of themselves" (51.3%).

【Conclusion】 This study found that 2 months of use of the menopausal application by perimenopausal women promoted behavioral change in eating habits and also alleviated symptoms in those with menopausal symptoms. Regarding the continuation of the menopausal application, it is necessary to devise ways to increase the continuation rate for the future.

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Introduction

Menopausal women often experience a variety of physical and mental disorders due to changes in ovarian function and social factors that greatly differ from individual to individual [1], and also affect health and life in old age. Approaches to ameliorate and prevent lifestyle-related diseases are necessary for health support throughout a woman's life [2]. Thus, it is necessary for menopausal women to objectively grasp their own menopausal symptoms [3] and to adapt to these changes by taking interest in the conditions of their bodies and minds and better knowing themselves. This can help them find a coping method they find suitable that can be put into practice [4]. If the menopausal women can improve their lifestyles by themselves to change their behavior, this might promote women's improved future health [5]. However, few previous studies have shown specific self-care methods which the menopausal women use for taking care of themselves.

The use of smartphones today [6] is increasingly advanced, making smartphones an indispensable item in our daily lives. The younger generation has a high rate of smartphone ownership, and they use their phones in a variety of ways. Numerous smartphone applications have been developed and can be easily used for such purposes as monitoring one's health. As monitoring menstrual and other symptoms on a daily basis aids women's healthcare [7] [8], women at menopause might be able to change their behavior and take actions for their health by installing a menopausal health management application on their smartphones to help them easily monitor their health conditions.

The aim of this study is to confirm whether the use of a menopausal application leads to changes in the behavior of menopausal women and to clarify whether health records with the application can serve as a self-health control method.

Methods

1. Study design

This study uses a one-group pre-post evaluation design.

2. Participants

The subject of this study is women aged from 40 to 59 years of age. According to many previous studies, the most appropriate time for health education of menopausal women is "from the age of 40, when ovarian function begins to decline [9-11]." The participants were limited to those who were not aware of menopausal symptoms or who began to be aware of them during five years after menopause. The inclusion has their own smartphones, do not have serious illnesses, have gynecological illnesses and are not currently receiving treatment, and meet all of the above conditions. In accordance with the exclusion criteria, those who were unable to install the menopausal application and who were unable to return self-completion questionnaires before and after the intervention. Participants were recruited through posters displayed at the university secretariat and mailing a poster for research recruitment to the mothers of students at University A.

3. Survey period

The study period was between July 15 and October 21, 2019.

4. Intervention

Upon giving consent, the participants provided basic information for this study and downloaded the menopause application to their smartphones. They inputted a self-check for two months (62 days; Photo 1, Figure 1). The self-completion questionnaires were provided before and after the intervention. The duration of the self-check was 62 days in order to maintain a record over two menstrual cycles. The application used in this study was a smartphone application software, Atrator, produced by CLIMB Factory, Inc., that has already been applied for the health management of athletes. Questionnaire items were minimally customized for health management by menopausal women. The menopausal application software is free of charge. Instructions for downloading it to each individual's smartphone were provided in writing, and questions could be asked and answered via the comments section of the application.

Photo 1
Menopausal application screen used for this study

5. Outcomes

1) The behavior stage of change

We confirmed the change condition of behavior with a transtheoretical model of psychological readiness state [12]. The behavior stages of change comprise a sequence of five stages. "Precontemplation" is the stage in which people do not intend to change behavior; "Contemplation" is the stage in which people intend to change behavior; "Preparation" is the stage in which people intend to change their behavior within one month; "Action" is the stage in which people have made observable changes in their behavior within the past six months; and "Maintenance" is the stage in which people have made and sustained behavior changes for six months or longer [13]. The behavior stages corresponding to the change in each item were scored ranging from "Precontemplation stage" = 0 to "Maintenance stage" = 5. Based on that, points were assigned to responses regarding their behavior in "health management," "eating

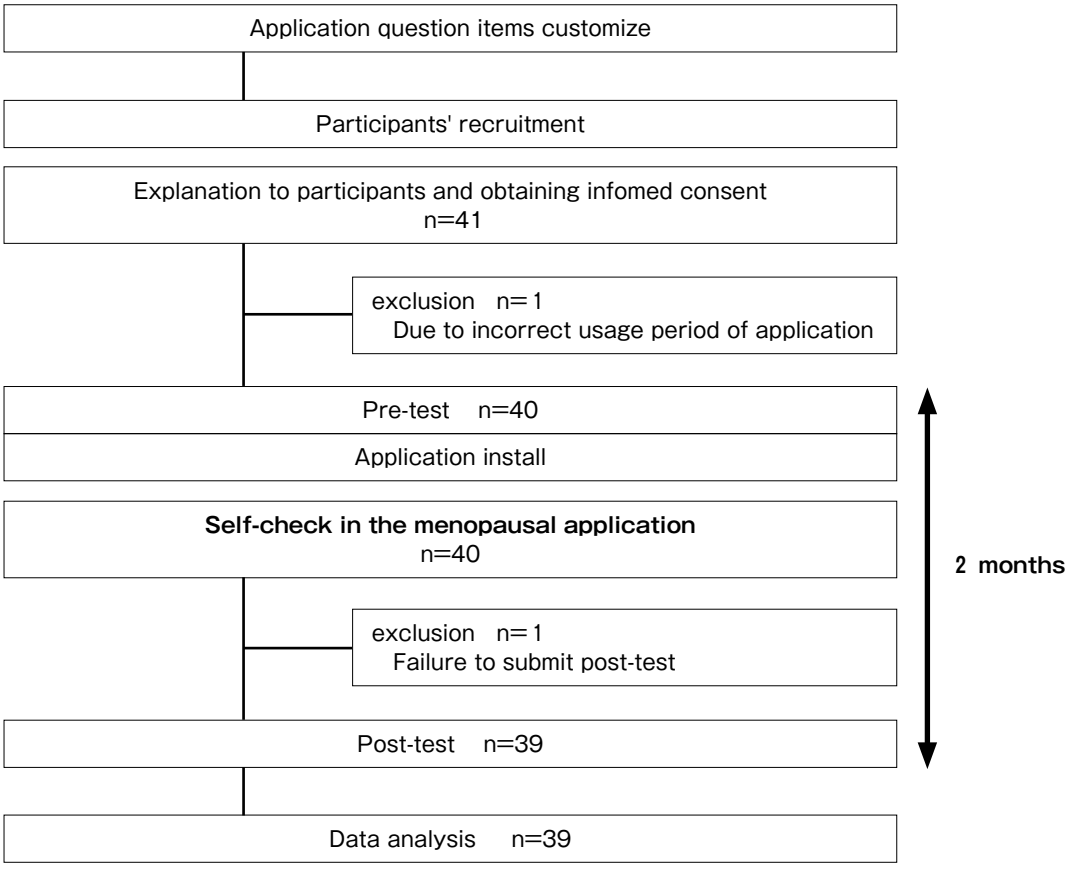

Figure 1 Survey flow

habits," and "exercise habits" before and after the intervention.

2) Simplified Menopausal Index (SMI)

The Simplified Menopausal Index (SMI) was developed for the specific symptoms of Japanese women in menopause. According to the severity of symptoms[14], 10 items were evaluated on a scale of 1–4 (respectively, *absent, mild, moderate*, or *severe*), with a total score of 100. The participants evaluated them by themselves before and after the intervention. The results were classified into three categories: 0–25 points "no issues" ; 26–50 points "borderline"; and 51–100 points "menopausal symptoms."

3) Self-health evaluation score

With the definition of an ideal health condition as 100, the current condition of each participant was self-evaluated and scored before and after the intervention[15]. Scoring their current health condition led participants to self-analysis, facilitating the effect of cognitive therapies.

4) Input state to the menopausal application

The recorded number of days and continuity of the application during were evaluated. Those who could input on every three days were classified as the continuation group who could input continuously. Others were classified as non-continuation group. In addition, opinions after using the menopausal application (usage state, own attention item, whether it can be used for health management, free opinions) were extracted from the free input contents (Table 1) of the menopausal application.

5) Characteristics of participants

A questionnaire survey was administered on age, gender, work pattern, menstrual status, health problems, exercise status, lifestyle activities, diet, snacking, sleeping, drinking, bowel movements, use of over-the-counter drugs, and daily application usage.

6. Analytical method

In order to investigate the effect of behavior change, the average scores of overall, health management, eating habits, and exercise habits were compared before and after using the menopausal application. In addition, in order to see the effect on menopausal symptoms, the ratios of the three SMI subgroups (no issues, borderline,

Table 1 Items for menopausal applications

Item	Answer method
Today's facial expression	Face scale selection
Condition	Choices (5 choices)
Areas of concern to the body	Shown on the part
Physical symptoms	Input symptom
Weight	Fill in numbers
BMI (automatic calculation)	(Automatic calculation weight inpnt)
Time of sleeping	Fill in numbers
Mental fatigue	Slider bar
Physical fatigue	Slider bar
Today's meal	Multiple selection (7 choices)
Today's activity	Choices (4 choices)
Motion	Presence or absence
Skin condition	Slider bar
Cold waist and limbs	Slider bar
Hot flashes on the face	Slider bar
Sweating	Slider bar
Sleep quality	Slider bar
Frustrated	Slider bar
Comment	Free-response question

Participants inputed all items daily.

and menopausal symptoms) were compared before and after using the menopausal application. In order to consider the spread of menopausal applications, the researcher described the input status of the menopausal applications and the opinions after use in descriptive statistics for the quantity data and for the free description. In the subgroup analysis, we examined age, SMI, and menopausal application continuity. There are two groups of ages, 40s and 50s, and SMI evaluations were used to define three groups: no issues, borderline, and menopausal symptoms. Two groups, the continuation group and the non-continuation group, were selected for continuous input, and a comparative study was conducted before and after the intervention.

For statistical analysis, 4Steps Excel Statistics 4th Edition was used. Descriptive statistics are expressed as mean ± standard deviation for quantitative variables and n (%) for qualitative variables. The comparison between the same two groups using the menopausal application was conducted with the Student's t-test and Wilcoxon signed-rank test, and the comparison of input days was performed with Welch's test after the F-test. A comparison of the three groups of SMI assessments was performed with the Kruskal-Wallis test. The significance level was set at $p = 0.05$.

7. Ethical considerations

This study was approved by the Medical Research Ethics Committee of Fujita Health University. The aim and methods of the study were explained to the participants in writing, and their consent was obtained. Ethical considerations included the following: Participation in the study was voluntary, no disadvantage would be incurred if the consent was not obtained, and even after it was given, consent could be withdrawn without any disadvantage (approved: July 3, 2019, Receipt number: HM19-0839).

Results

1. Characteristics of the participants

Excluding 2 people who met the exclusion criteria, the participants comprised 39 women aged 40 to 57 years. The average age of the subjects was 49.1 ± 4.1 years. There were 30 people (76.9%) who used the application on a daily basis and 1 person (2.6%) who did not use it often (Table 2).

2. Behavior stage of change

The average score of behavior modification of eating habits increased significantly after the intervention ($p = 0.012$). There were no significant changes in the stages of health management and exercise habits (Table 3). In the health management and eating habits of the group in their 50s, there was a significant increase after the intervention ($p = 0.043, p = 0.020$). The stages of behavior change in health management and eating habits in the continuation group of the input of the menopausal application increased significantly ($p = 0.043, p = 0.016$).

3. SMI

There was no significant difference in the average total score before and after the intervention. The group assessed as having menopausal symptoms showed a drop in SMI after the intervention (p = 0.004; Table 4).

4. Self-health evaluation score

There was no significant difference in the average total score before and after the intervention (Table 4). Before the intervention, there were two self-health evaluations of 0 points, but their scores after the intervention increased to 20 points and 50 points. In the group in their 40s, the scores increased significantly after the intervention ($p = 0.026$), and for the group assessed as having menopausal symptoms, the score also increased significantly after the intervention ($p = 0.023$; Table 4).

5. Menopausal application input status and opinions after using the application

The overall average number of input days was 43.3 ± 18.1 days. There was no significant difference in the number of days in the inputs in the age and SMI intragroup comparisons (Table 5). Eight participants (20.5%) were able to input daily for 62 days. While using the menopausal application, there was one person who went to the hospital, one who started hormone therapy, and one who decided to have surgery. About the application usage status, more than half of the

Table 2 Characteristics of participants

		Overrall n=39
Age		49.1 ± 4.1
Work style	Full-time	23 (59.0)
	Part	13 (33.3)
	Unemployed	3 (7.7)
History of obstetrics and gynecology surgery	Surgery	12 (30.8)
	Not operated	27 (69.2)
Menstrual status	Regular	11 (28.2)
	Irregular	14 (35.9)
	Haven't come recently	3 (7.7)
	Menopause	11 (28.2)
Menopausal drug use	None	33 (84.6)
	Chinese herbal medicine	6 (15.4)
Supplement usage	Not used	24 (61.5)
	Are using	14 (35.9)
Sleep quality	I'm sleeping	20 (51.3)
	I'm not sleeping	19 (48.7)
1 hour of activity every day	Can	7 (17.9)
	Can not	32 (82.1)
Exercise for about 30 minutes twice a week	Can	3 (7.7)
	Can not	36 (92.3)
Daily application usage	Used on a daily basis	30 (76.9)
	Occasionally used	8 (20.5)
	I don't use it much	1 (2.6)
Use of health application	Are using	16 (41.0)
	Not used	23 (59.0)

Values are expressed as the number (%) or mean ± standard deviation

Table 3 Changes in behavior stage

		n (%)	Pre-use application Mean ± SD	Post-use application Mean ± SD	*p*
Health managemen	Overall	39	2.3 ± 1.4	2.6 ± 1.4	.126
Age	40s	18 (46.2)	2.5 ± 1.4	2.6 ± 1.3	.441
	50s	21 (53.8)	2.1 ± 1.4	2.7 ± 1.5	.043
SMI	No issues	7 (17.9)	2.4 ± 1.5	2.7 ± 1.4	.317
	Borderline	20 (51.3)	2.7 ± 1.4	3.0 ± 1.4	.382
	Menopausal symptoms	12 (30.8)	2.7 ± 1.4	2.7 ± 1.4	.281
Continuation	Continuation group	16 (41.0)	2.6 ± 1.5	3.2 ± 1.3	.043
	Non-continuation group	23 (59.0)	2.1 ± 1.2	2.3 ± 1.3	.336
Eating habits	Overall	39	2.5 ± 1.4	2.9 ± 1.5	.012
Age	40s	18 (46.2)	2.2 ± 1.4	2.5 ± 1.2	.129
	50s	21 (53.8)	2.7 ± 1.3	3.3 ± 1.5	.020
SMI	No issues	7 (17.9)	2.7 ± 1.9	2.7 ± 1.9	1.00
	Borderline	20 (51.3)	2.9 ± 1.2	3.4 ± 1.2	.055
	Menopausal symptoms	12 (30.8)	2.7 ± 1.4	2.7 ± 1.4	.043
Continuation	Continuation group	16 (41.1)	2.6 ± 1.4	3.3 ± 1.5	.016
	Non-continuation group	23 (59.1)	2.3 ± 1.3	2.7 ± 1.3	.083
Exercise habits	Overall	39	1.9 ± 1.4	2.0 ± 1.4	.089
Age	40s	18 (46.2)	2.3 ± 1.5	2.3 ± 1.4	.500
	50s	21 (53.8)	1.7 ± 1.2	1.7 ± 1.4	.496
SMI	No issues	7 (17.9)	1.9 ± 1.1	1.9 ± 1.1	1.00
	Borderline	20 (51.3)	2.1 ± 1.6	2.4 ± 1.6	.285
	Menopausal symptoms	12 (30.8)	1.8 ± 1.1	1.8 ± 1.1	1.00
Continuation	Continuation group	16 (41.2)	2.0 ± 1.5	2.3 ± 1.5	.313
	Non-continuation group	23 (59.2)	1.9 ± 1.3	1.8 ± 1.2	.656

Wilcoxon signed-ranks test
SD：standard deviation, SMI：Simplified Menopausai Index

Table 4 Changes in SMI and self-health evaluation

		n (%)	Pre-use application Mean ± SD	Post-use application Mean ± SD	*p*
SMI	Overall	39	41.9 ± 19.2	40.7 ± 18.3	.435
Age	40 s	18 (46.2)	40.4 ± 14.7	40.1 ± 14.5	.879
	50 s	21 (53.8)	43.1 ± 22.7	41.2 ± 21.4	.414
SMI	No issues SMI≦25	7 (17.9)	18.1 ± 7.3	25.1 ± 13.6	.063
	Borderline 26≦SMI≦50	20 (51.3)	36.2 ± 7.4	36.6 ± 15.4	.985
	Menopausal symptoms 51≦SMI	12 (30.8)	65.3 ± 11.8	56.6 ± 13.9	.004
Continuation	Continuation group	16 (41.0)	41.7 ± 18.8	41.0 ± 18.4	.643
	Non-continuation group	23 (59.0)	42.0 ± 19.1	40.4 ± 17.9	.766
Self-health evaluation	Overall	39	61.0 ± 21.3	66.2 ± 15.3	.075
Age	40s	18 (46.2)	57.8 ± 22.0	66.7 ± 15.6	.026
	50s	21 (53.8)	63.8 ± 19.7	65.7 ± 14.6	.417
SMI	No issues	7 (17.9)	80.7 ± 6.1	76.4 ± 12.5	.750
	Borderline	20 (51.3)	66.3 ± 11.1	69.3 ± 13.4	.171
	Menopausal symptoms	12 (30.8)	40.8 ± 24.3	55.0 ± 13.8	.023
Continuation	Continuation group	16 (41.0)	61.3 ± 17.7	69.1 ± 13.7	.053
	Non-continuation group	23 (59.0)	60.9 ± 23.0	64.1 ± 15.6	.224

Wilcoxon signed-ranks test
SD：standard deviation, SMI：Simplified Menopausai Index

Table 5 Number of input days

		n (%)	Number of input days Mean ± SD	*p*
	Overall	39	43.3 ± 18.1	
Age	40s	18 (46.2)	37.6 ± 19.2	.075 [1]
	50s	21 (53.8)	48.1 ± 16.0	
SMI	No issues	7 (17.9)	42.7 ± 22.2	.945 [2]
	Borderline	20 (51.3)	41.5 ± 19.8	
	Menopausal symptoms	12 (30.8)	46.6 ± 12.8	

1. Welch's test 2. Kruskal-Wallis test
SD：standard deviation, SMI：Simplified Menopausai Index

participants selected the following items were "Good not to have to input every day" (69.2%), "Easy to input" (59.0%), and "I was able to do it at my favorite time" (51.2%), and regarding the influence on one's own health management, "It helped me to know my physical condition" (64.1%) and "Can also be used for health management" (51.3%) were highest-ranked (Table 6).

Discussion

A significant increase was indicated in eating habits as a change in action habits due to the use of a menopausal application by menopausal women. This result suggests that the use of the menopausal application allowed menopausal women to know themselves and led to changes in their behavior. We have thus shown that the menopausal application can be used as a self-health management method.

Menopausal women have diverse roles in their lives, including work, child-rearing, housework, and family care[3]. Therefore, they experience much stress and many burdens, both mentally and physically[4)16)]. It has been reported that many of them want to improve their lives but are unable to adjust due to their multiple roles[2)]. Applications have been found to facilitate health management. A previous study reported that the use of email promoted successful weight loss through nutritional guidance[17)]. Similarly, it has been reported that keeping a record of menstrual symptoms using an application enhanced us-

Table 6 Participant's opinions (Multiple items can selected.) n=39

Usage of menopausal apps	n (%)
Good not to have to input every day	27 (69.2)
Easy to input	23 (59.0)
I was able to do it at my favorite time	20 (51.2)
Easier to record than paper	19 (48.7)
Easy to forget to enter	17 (43.6)
Items you want to see can be graphed	12 (30.8)
There was an item to be worried about	7 (17.9)
Many items	6 (15.4)
Input is troublesome	5 (12.8)
It takes time to input	4 (10.3)
Installation complexity	0 (0.0)
Impact on your health care	
It helped me to know my physical condition	25 (64.1)
Can also be used for health management	20 (51.3)
Especially the way of life did not change	16 (41.0)
Increased interest in health	12 (30.8)
Became a habit of using	9 (23.1)
I noticed a change in my body	7 (17.9)
You don't have to be an "attractor"	6 (15.4)
The way of thinking about healthcare has changed	5 (12.8)
Healthcare does not change the way of thinking	5 (12.8)
Started working on health care	3 (7.7)
Understand the need for a health check	1 (2.6)
I had a medical examination	1 (2.6)
Not very useful	0 (0.0)

ers' awareness of their self-state and changes in their daily life as effectively as the conventional method of recording such information on paper[8]. This study similarly suggests that the use of the menopausal app made the users aware of their own health condition and led to changes in their daily lives. It is probable that the significant behavior changes in the continuation group were caused by the continuous recording of one's living condition in the menopausal application, which triggered participants to "look at themselves" and led to coping behavior. Shima[18] mentioned that "a system for supporting selfcare requires an approach to promote interest in it and the establishment of a method to understand our health conditions." We consider the menopausal application a useful item to promote such selfcare.

In the SMI evaluation of menopausal symptoms, the SMI scores decreased after the intervention. There is a report that menopausal women do not take an action to receive medical checkup until feeling the need of treatment, even though they have had physical symptoms and high SMI[16]. However, there are some of the participants who got a check-up at a hospital, who started hormone therapy, or who decided to have surgery for the duration of the intervention. Fujita[7] mentioned that "the record of symptoms, which subjects with premenstrual syndrome are keeping in an application, is useful for the diagnosis of PMS and has a cognitive therapeutic effect on itself." The menopausal application made them conscious of menopausal symptoms by recording their health conditions and led many of them to see a doctor or receive treatment. Because the menopausal application could be carried with them at all times, 64.1% of the participants responded that it was helpful to them knowing their physical conditions. We consider that recording their health status in the menopausal application helped them to recognize abnormalities and to move on to the next behavioral stage. Therefore, we suggest that the use of the menopausal application leads to behavior modification.

In terms of self-health evaluation scores, the scores of the group in their 40s and the meno-

pausal symptom group increased after intervention. The self-health evaluation scores increased significantly for the group assessed as having menopausal symptoms after the intervention. As indicated by the response that it can be used for health management (51.3%), we consider that the health evaluation score improved because the application helped participants take action to adjust their health conditions.

It has been reported that increasing numbers of menstrual application users who have unpleasant symptoms such as menstrual syndrome are recording their experiences[7]. Regarding the number of input days for the menopausal application, 20.5% of the respondents were able to input data every day, and in the continuation group this was true of 16 users (41.1%), and no significant difference was found between groups in the number of input days. Therefore, it is necessary to examine the contents of the menopausal application to increase the continuation rate. Since we considered that many menopausal women might not be adept at operating smartphones, we customized the application so as to be easily and quickly operable by menopausal women in one operation, which contributed to the response that "easy to input" (59.0%). The menopausal app has the advantage that it is always with the user everywhere, so the data can be entered immediately. This contributed to the response, it was "good not to have to input every day" (69.2%). However, there were also comments that it was "troublesome" and "time-consuming." We found that the menopausal application could be a unfamiliar method for those who are not adept at using smartphones. Therefore, certain support measures are required, such as the initial connection and ongoing support.

It was inferred that there were also changes in daily physical symptoms in the participants' diverse lifestyles. As the standard deviation of the mean shows a wide range, there are expected to be large individual differences. It has been reported that menopausal women can successfully overcome the challenge of menopause if they can find and practice a coping method that suits them[10]. The use of this menopausal application has the effect of promoting self-understanding and self-care in managing health, and thus can be considered a method that leads to self-health management.

There are several limitations to this study. The input period for the menopausal application was two menstrual cycles, but it seems that it takes about 6 months to note one's progress and change one's behavior. In addition, the input is from the continuation group (16, 41.1%), and it is necessary to devise ways to increase the continuation rate. In addition, in order to lead to clear results by age, it is necessary to increase the number of participants in each 5-year-interval group and verify the findings in greater detail. Smartphone penetration among people in their 40s and younger is high, so it is predicted that they will have little difficulty using the application. Therefore, we believe that using apps tailored to each period of a woman's life cycle will help lead to behavior change.

Conclusion

It was hypothesized that the use of a menopausal application customized for the health management of menopausal women would lead them to better visualize their own health condition, leading in turn to behavior change. This study found that the effect of the menopausal application does indeed promote behavioral changes in eating habits and help users relieve menopausal symptoms, enhancing the self-health evaluation of the participants in their 40s and those with menopausal symptoms. On the other hand, it is necessary to devise ways to increase the continuation rate in the future.

Conflict of Interest

There is not conflict of interest to be disclosed.
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References

1）Kume M：Women's life stages and their characteristics, menopause and old age, Kume M ed.：Women's Healthcare and Life stage, Ishiyaku Publishers, Inc., 96－123, Tokyo, 2007（in Japanese）

2）Ikeda T, Maeda T：Investigating health support for menopausal women. Journal of Japanese Society of Psychosomatic Obstetrics and Gynecology, 15(1), 162－168, 2010（in Japanese）
3）Ikeda T, Maeda T：Study on the health support for the menopausal women in rural areas. Japanese Journal of Maternal Health, 50(4), 656－664, 2010（in Japanese）
4）Iioka Y：Mental and Physical Changes Experienced by Perimenopausal Women and Coping Methods. Journal of Japanese Society of Psychosomatic Obstetrics and Gynecology, 15(2), 237－247, 2010（in Japanese）
5）Miyauchi K：Effect of a health education intervention with a feedback leaflet for middle-aged female workers. Japanese Journal of Health Education and Promotion, 18(3), 186－198, 2010（in Japanese）
6）Ministry of Internal Affairs and Communications：communication usage trend survey points, 2018［online, https://www.soumu.go.jp/johotsusintokei/statistics/data/190531_1.pdf］Ministry of Internal Affairs and Communications, 2. 1. 2019（in Japanese）
7）Fujita S, Horikawa K, Hamada T：Effective use of an application software of smartphone for the self-monitoring of menstruation. Journal of Japanese Society of Psychosomatic Obstetrics and Gynecology, 22(3), 271－277, 2017（in Japanese）
8）Egawa M, Okamoto K, Nishimura F, et al.：Development of a smartphone application system of symptom-recording to manage premenstrual syndrome and its clinical use. Journal of Japanese Society of Psychosomatic Obstetrics and Gynecology, 21(1), 105－113, 2016（in Japanese）
9）Ueda M：Health support desired by menopausal women and the methods to collect the information. Japanese Journal of Maternal Health, 49(1), 57－64, 2008（in Japanese）
10）Honda C, Kabeyama K：Changes in perception of menstruation in menopausal women. Journal of Japan Academy of Midwifery, 30(1), 131－140, 2016（in Japanese）
11）Tanaka Y：The effects of coping with menopausal symptoms on the psychological adjustment of middle-aged women. The Japanese Journal of Developmental Psychology, 26(4), 322－331, 2015（in Japanese）
12）Tsuda A, Horiuchi S, Kim E, et al.：A guide for differential approach to stage of change for practicing effective stress management based on transtheoretical model（TTM）. Kurume University Psychological Research, 9, 77－88, 2010（in Japanese）
13）Takenaka K：Creating a mechanism to encourage the start and continuation of health behavior, Public Interest Incorporated Foundation Health and Physical Fitness Foundation, Shakaihoken-kenkyusho, 1－80, 2013（in Japanese）
14）Honjyo H, Ohama K, Aso T, et al.: Report of "Establishment of Menopausal and Geriatric Scores for Japanese and HRT Side Effect Investigation Subcommittee". Preparation of menopausal symptom evaluation table for Japanese women. Acta Obstetrica et Gynaecologica Japonica, 53(5), 883－888, 2001（in Japanese）
15）Ministry of Health, Labor and Welfare：Standard medical examination health guidance program, 2018(4)
［online, https://www.mhlw.go.jp/stf/seisakunitsuite/bunya/0000194155.html］Ministry of Health, Labor and Welfare 2. 1. 2019（in Japanese）
16）Ueda K, Miyatake H, Takiguchi N：The Relation Between Health Perception and Menopausal Symptoms and Life Style in Middle-aged Women. The Japanese Red Cross Hiroshima Coll. Nurs, 2, 65－71, 2002（in Japanese）
17）Okamoto K, Makino A, Makino T：A case of successful reducing body weight got ovulate using picture mails by mobile phone in infertility obese woman. Treatises and Studies by the Faculty of Kinjo Gakuin University. Studies in Natural Sciences, 10(2), 1－4, 2014（in Japanese）
18）Shima A, Takamami S：Research on Establishment of Community-Based Health Care System for Women in Menopause-Demands for Health Care Services According to Ages in Urban Area. Journal of comprehensive nursing research, 8(2), 15－24, 2005（in Japanese）

更年期女性のスマートフォンアプリケーションを用いた自己健康管理方法の有効性

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要　旨

【目的】更年期専用のスマートフォンアプリケーション（アプリ）の利用が、自己の健康管理に有効であるか、継続性があるかを検証することを目的とした。

【方法】40歳～57歳の39名の女性が、更年期のアプリを２か月間使用し、健康状態を自由に記録した。介入前後の行動変容、簡略更年期指数（SMI）、自己健康評価点数、および更年期のアプリの継続性を調査した。

【結果】更年期のアプリの使用後に、食習慣の行動変容ステージに有意差がみられた。また「更年期症状群」のSMIが低下した。平均入力日数は43.3±18.1日であった。更年期のアプリは「自分の身体状況を知るのに役立った（64.1%）」、「健康管理に使えると感じる（51.3%）」と回答した。

【結論】更年期の女性が更年期のアプリを２か月間の使用したことで、食習慣の行動変容を促し、更年期症状のある者の症状を緩和することが分かった。更年期のアプリの継続については、今後、継続率を高める工夫が必要である。