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Recruitment and Retention of Asian Americans in Web-Based Physical Activity Promotion Programs

A Discussion Paper

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Web-based interventions that promote physical activity have been tested in various populations and proven effective. However, information on recruiting and retaining ethnic minorities in these interventions is limited. This study discusses practical issues in recruitment and retention of Asian Americans using three strategies: (1) only Web-based intervention (Group 1), (2) one with Fitbit Charge HR (Group 2), and (3) one with Fitbit Charge HR and office visits (Group 3). Recruitment and retention rates, minutes of weekly research team meetings, and the researchers' memos were collected. Retention rates were analyzed using descriptive statistics, and the minutes and memos were content analyzed following Weber's methods. Retention rates varied by the end of the first (12% in Group 3, 36.9% in Group 2) and third month (0% in Group 3, 36.9% in Group 2). The practical issues were (1) difficulties in recruitment across strategies, (2) the necessity of using community consultants/leaders across strategies, (3) subethnic differences across strategies, (4) timing issues across strategies, (5) Fitbit as a facilitator with several hindrances, and (6) office visits as an inhibitor. Fitbits with user guidelines and community consultants'/leaders' involvement are proposed for future Web-based interventions to promote physical activity in Asian Americans.

KEY WORDS: intervention, physical activity, recruitment, retention, Web-based

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With advances in technologies, various types of strategies using technology, such as Web-based interventions, have been adopted to promote physical activity.¹⁻³ These interventions are widely accepted and welcomed by users, healthcare providers, and researchers,¹⁻³ because they offer access 24 hours a day without the need for physical attendance. For the same reason, they are reportedly effective in changing health behaviors, such as physical activity, even among isolated or marginalized people by race or ethnicity and geographical areas, and/or with stigmatized conditions.^{4,5} Web-based programs work better and are more beneficial to racial or ethnic minorities than whites.^{4,5} An increasing number of experts envision Web-based programs as having the potential to minimize ethnic disparities in health and illness, by providing ethnic minorities with the necessary information and support that are rarely provided in traditional settings.^{2,6}

The changing demographics of Internet populations, with an increasing number of ethnic minorities, spurs interest in using the Internet as an intervention medium for racial and ethnic minorities.⁴ Despite the reported benefits of Web-based interventions on physical activity promotion,¹⁻³ they rarely target racial or ethnic minorities, especially Asian American midlife women who are reportedly at a high risk for chronic diseases, including cardiovascular diseases, hypertension, and Type 2 diabetes.⁷⁻⁹ Asian American midlife women are less likely to participate in physical activity compared to their white and Asian counterparts who reside in their country of origin.^{10,11} Consequently, promoting physical activity among Asian Americans, through various methods, including Web-based programs, is necessary.

Although many researchers adopted various strategies in Web-based interventions using different emerging technologies, information on the best strategies to recruit and retain ethnic minorities in a Web-based physical activity promotion intervention is limited. In recent years, accelerometers have been used in physical activity promotion interventions for diverse populations. Fitbits (Fitbit Inc, San Francisco, CA) are among those frequently used in research.¹²⁻¹⁵ Fitbits include

triple axis accelerometers to measure motion patterns in three different planes and an altimeter to calculate the number of stairs climbed.^{12–15} Specifically, the Fitbit Charge HR stores unlimited days of steps, distance, and moderate-to-vigorous physical activity minutes; automatically resets to 0 at midnight; and records time, total steps, resting heart rates, and bout steps per hour.¹⁶ However, Fitbits are rarely incorporated into Web-based interventions, especially those involving racial and ethnic minorities; materials on issues related to Web-based interventions using accelerometers are also scarce.^{17,18} When MEDLINE was searched using the keywords *Fitbits* and *Web-based*, only six articles were retrieved; none of them discussed practical issues in using Fitbits in Web-based physical activity promotion programs. Likewise, materials are lacking regarding practical issues in recruitment into and retention of racial and ethnic minorities in Web-based interventions promoting physical activity and using Fitbits. Such information is essential to provide directions for the future usage of Web-based programs. To address the literature gap, this paper discusses the practical issues in recruitment and retention of Asian Americans using three strategies for Web-based physical activity promotion interventions: (1) only Web-based intervention, (2) a Web-based intervention with the use of Fitbit Charge HR, and (3) a Web-based intervention with the use of Fitbit Charge HR and with office visits. Here, *Asian American* means only Chinese and Korean Americans; Chinese were chosen because they are the major subethnic group within Asian Americans, and Koreans were chosen because they are the most rapidly increasing subethnic group within Asian Americans.¹⁹ The discussion points are based on a Web-based intervention study among Asian Americans as an example. In the subsequent sections, first, the parent study that serves as the basis for discussion and the method to extract the discussion points are explained. Second, the identified recruitment and retention issues are discussed. Finally, suggestions for future Web-based interventions that promote physical activity are proposed.

THE PARENT STUDY: BASIS FOR DISCUSSION

The parent study aimed to promote physical activity among Asian Americans using a Web-based physical activity promotion program with three different strategies: (1) only Web-based intervention (Group 1), (2) a Web-based intervention with the use of Fitbit Charge HR (Group 2), and (3) a Web-based intervention with the use of Fitbit Charge HR and office visits (Group 3). The study was approved by the institutional review board of the institutes where the study was conducted. Using a convenience sampling, 165 Asian Americans were recruited into a repeated-measures pretest/posttest (pretest, 1-month and 3-months posttests) randomized controlled group study. The participants volunteered and selected their own group. In each group, they were

randomized into an intervention or control group. The sample size was determined based on the number of participants adequate for a pilot study (ie, approximately 30).²⁰ The inclusion criteria were self-reported Asian Americans aged 20 to 60 years whose parents and grandparents were of Asian descent; who were literate in English, Mandarin Chinese, or Korean and currently residing in the US; and who had access to the Internet using computers or mobile phones. To prevent any potential unexpected harmful effects of increasing physical activity during the intervention, the risk factors were screened using the screening questions by Wilbur et al.²¹ The study was announced in the Internet and local communities using Web announcements and flyers, respectively. Potential participants who visited the project Web site and consented to participate in the study after reviewing the electronic informed consent form were screened against the inclusion criteria. When they met the inclusion criteria, they were linked automatically to the Internet surveys. Once they completed a pretest survey, they were automatically randomly assigned to the intervention and control groups using the randomization program by the survey system. Then, only the intervention group was asked to visit the project Web site and use the intervention through the Web site. The control group was asked to use the Web site on physical activity promotion by the Centers for Disease Control and Prevention.

Figure 1 illustrates the recruitment and retention process (a CONSORT flow diagram). Across the three groups, the same instruments were used. They included the questions on background characteristics and health/disease status; questions on attitudes toward physical activity, subjective norm, perceived behavioral control, and behavioral intention²²; the Perceived Isolation Scale^{23,24}; the Physical Activity Assessment Inventory²⁵; the modified Barriers to Health Activities Scale²⁶; and the Kaiser Physical Activity Survey.²⁷ The reliability and validity of all instruments were established in Asian populations with Cronbach's α ranging from .62 to .97.^{23–27} All participants were reimbursed with US \$50 gift cards regardless of the group to which they were assigned. The data were analyzed using the generalized linear mixed modeling method. More detailed information on the parent study and the interventions could be found elsewhere (“A Pilot Physical Activity Intervention Study on Depressive Symptoms of Midlife Korean Americans” [in preparation]).^{28,29}

METHODS TO IDENTIFY THE ISSUES

To support the discussion points, recruitment and retention rates in the three groups were calculated using descriptive statistics, specifically the numbers of participants in the pretest, 1-month and 3-months posttests that were recorded in the database of the Web-based program. Then, the researchers' individual memos on practical issues in using each of the three strategies and the minutes of weekly research

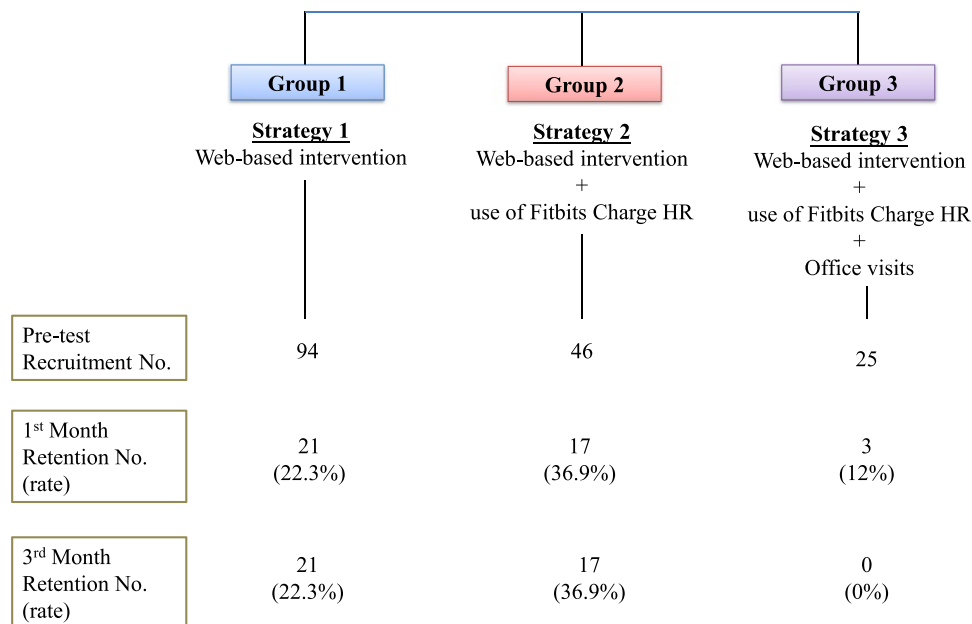


FIGURE 1. Web-based physical activity program.

team meetings were used to support the discussion points. The research team wrote individual memos (research diaries) whenever issues came up and kept the minutes of weekly research team meetings. The memos and minutes were analyzed using the content analysis method by Weber.³⁰ Individual words were the unit of analysis; line-by-line coding was done; and themes were extracted from categorization. The themes reflecting the recruitment and retention issues included (1) difficulties in participant recruitment across strategies, (2) the necessity of using community consultants/leaders in recruitment and retention across strategies, (3) subethnic differences across strategies, (4) timing issues across strategies, (5) Fitbit as a facilitator with several hindrances, and (6) office visits as an inhibitor.

ISSUES IN RECRUITMENT AND RETENTION

Table 1 summarizes the recruitment and retention rates. In total, 217 Asian Americans agreed to participate in the study and were screened against the inclusion and exclusion criteria. Among them, 165 were eligible for and included in the study.

By the end of the first month, 41 participants (24.8%) were retained across the groups. By the end of the third month, 38 participants (23%) were retained across the groups. The retention rates per group varied at the end of both the first month (36.9% in Group 2 as the highest and 12% in Group 3 as the lowest) and the third month (36.9% in Group 2 as the highest and 0% in Group 3 as the lowest). A total of six themes reflecting the issues in recruitment and retention were identified. Four themes were common across three strategies: (1) difficulties in recruitment, (2) the necessity of using community consultants/leaders in recruitment and retention, (3) subethnic differences, and (4) timing issues. Two themes reflected the differences across the strategies: (1) Fitbit as a facilitator with several hindrances and (2) office visits as an inhibitor. These five themes are discussed further below.

Recruitment Difficulties

In general, the recruitment of Asian Americans into the Web-based intervention study was a difficult task. The researchers contacted 935 communities or groups of Asian

Table 1. Recruitment and Retention Rates in the Intervention Groups Using Three Different Strategies

	Group 1	Group 2	Group 3	Total
No. of those screened	112	70	35	217
No. of those recruited	94	46	25	165
No. of those retained by the end of the first month	21	17	3	41
Retention rates by the end of the first month, %	22.3	36.9	12.0	24.8
No. of those retained by the end of the third month	21	17	0	38
Retention rates by the end of the third month, %	22.3	36.9	0.0	23.0

Americans for study announcements, and only 310 agreed to post and, subsequently, posted the study announcements through their Web sites and email lists. Indeed, few intervention studies have reached ethnic minorities in numbers that produce valid data, which is a methodological difficulty of racial and ethnic minority studies in general.^{31,32} The recruitment of Group 3 was the most difficult, as all the participants in this group did not like multiple office visits because of time commitment for the study. Group 3's retention rate was also the lowest. Three participants in Group 3 who retained by the end of the first month also reported their dissatisfaction with the amount of participation reimbursement (US \$50); they believed the amount was small considering their efforts to participate in the study.

A possible reason for the difficulties in recruitment would be Asian Americans' own perception of their level of physical activity. Im and Choe³³ reported that Korean American midlife women defined physical activity broadly and deemed death as the only physical inactivity; breathing is perceived as a physical activity in Asian Americans.³³ This broad definition of physical activity could possibly make them perceive that their physical activity is adequate and thus are not in need of any further information, coaching, or support, thereby hindering participation in a research study on enhancing physical activity.

Participant recruitment and retention in Web-based research are also generally difficult. Low response and high dropout rates in Web-based research have been reported.¹⁻³ A Web-based approach is usually assumed to be easier than the traditional one because of its nature (eg, flexible approach, 24-hour accessibility, high speed).³⁴ Moreover, the recruitment and retention of Asian Americans through non-face-to-face interactions were reportedly difficult.¹⁻³ Especially in Web-based interventions, the participants would not feel committed to complete the intervention, could easily stop their participation by leaving the Web site, and/or might feel uncomfortable or incompetent in using Web-based tools.³⁴

Using Community Consultants and Leaders as a Necessity

The use of community consultants and leaders was essential in recruitment and retention of the participants across the three groups. However, involving community consultants and leaders in the participants' recruitment and retention was difficult without previously established relations. In one case, the research team received a phone call from a pastor of an Asian church who advised the team to change the strategy of contacting community consultants and leaders. He suggested that using emails and/or phone calls in English would not work and that the research team members should make actual visits to the sites and use subethnic languages (eg, Mandarin Chinese and Korean), so that the community members could see them. Following his

suggestion, the research team visited several community sites, resulting in the recruitment of several participants. Especially for Group 3, having a research team member who knew the communities and groups was essential. The research team could not recruit any participant for 3 months until a culturally matched team member was hired.

Subethnic Differences

Only three languages, including English, Mandarin Chinese, and Korean, were used in the study because they are the major languages of Chinese and Korean Americans. As mentioned above, only Chinese and Korean Americans were included in this study as the first group to target. Interestingly, the recruitment of Chinese participants was much easier than for Koreans across the three groups. For example, in recruiting 33 Chinese participants, 72 communities and groups were contacted, and 52 of them announced the study. In contrast, in recruiting 13 Korean participants, 422 communities and groups were contacted, and 72 of them announced the study. In other words, two communities or groups must be contacted to recruit one Chinese participant, whereas 32 were needed to recruit one Korean participant. This subethnic difference could be due to differences in population sizes in the US, which could influence the number of potential participants available in a community or group. Again, Chinese is the largest group of Asian Americans (3.79 million), whereas Korean is the fifth (1.7 million).³⁵

The difference in their attitudes toward research is another reason. Although cultural differences in the attitudes were not explored in this study, Korean Americans were more hesitant to participate compared to Chinese Americans across the three groups. A third possible reason would be their attitudes toward the amount of participant reimbursement. Although the reason was not clear, Korean Americans found the amount (US \$50) inadequate, whereas Chinese Americans considered it adequate.

Timing Issues

Timing issues in Web-based interventions have been reported in the literature.^{34,36} In this study, timing issues refer to those related to timing of recruitment and retention in the interventions using the three strategies.^{34,36} Our findings were consistent with the literature. Indeed, during Thanksgiving and Christmas holidays, recruiting and retaining the participants were especially difficult. In early December, 33 participants in Group 2 completed the pretest, but only three of them were retained at the 1-month post-survey despite multiple reminder emails. In mid-January, we recontacted and reminded the participants and retained six more participants successfully within a week. These instances illustrate the importance of the timing of recruitment and

retention in using any strategies in Web-based physical activity promotion programs.

Fitbit as a Facilitator With Several Hindrances

The use of Fitbits attracted more participants, especially younger ones aged between 20 and 30 years in Group 3. Most of them indicated that they were interested in the study for the Fitbits, but they were not retained in the surveys because of the required office visits for data collection and face-to-face interactions. Only when they were reminded to return the Fitbits did a few of them complete the 1-month post-survey. The use of Fitbits was also successful in recruiting and retaining Group 2 participants, whose retention rate (37%) was higher than Group 1 (22%) who did not use Fitbits (Table 1). Moreover, they indicated that they wanted to keep the Fitbits after completing the study.

There were several hindrances in the use of Fitbits, however. First, we needed to develop the guidelines for the use of Fitbits, as the company provided the instructions only in English. Additionally, the instructions were technical, and the participants needed to install the program on their desktop computers. Therefore, more detailed instructions were developed by the research team in three languages, including English, Mandarin Chinese, and Korean. Individual accounts for each participant were also created, and account IDs and passwords were provided to them because of anticipated difficulties in creating the IDs and passwords. Also, the research team needed to monitor the Fitbit data for coaching and support.

Another hindrance was the possible loss of Fitbits. To prevent such instances, we needed to track the mailing process by using certified mail and purchasing insurance. Subsequently, we needed to adjust the budget to accommodate the high mailing fees. During the study period, there was no problem with the mailing process that we adopted. However, in one case, the participant lost her Fitbit, prompting the research team to contact her because her data on the Fitbit dashboard were not updated for 2 weeks. She reported the loss of her Fitbit and wanted to pay for it. Fortunately, the Fitbit company replaced her Fitbit with a new one and linked it to the previous data on the Fitbit dashboard. Nevertheless, based on the research team meetings, we needed to drop her data because her intervention was stopped during the implementation. We also needed to set policies related to the loss of Fitbits.

The synchronizing process for the participants raised another issue. Several participants perceived the setup and synchronizing procedures related to the use of Fitbits as complicated and time consuming. Despite our detailed instructions and multiple reminders, one participant did not finish the initial step to install until the end of the first month after receiving her Fitbit. Additionally, even though a participant

used the device as instructed, her data could not be obtained if she had not synchronized her wrist band with the Fitbit Web site (the tracker could save the data only up to 7 days without synchronizing). Despite frequent reminders on synchronizing by the research team, data were lost due to the participants' delayed synchronization.

Swimming was a major type of physical activity for many Chinese women, but Fitbits did not support the data collection on the duration and intensity of swimming. Thus, the participants were asked to record their swimming activities on the activity log in their Fitbit accounts, which was also perceived as burdensome by several participants. The participants also had to take off their Fitbits before swimming, which, subsequently, increased the possibility of losing their Fitbits in the swimming pool.

Finally, another hindrance was keeping Fitbits charged all the time. As the participants were required to use Fitbits for 3 months, they needed to charge their Fitbits regularly. Although the charging process was easy, charging Fitbits completely took a long time, and Fitbits needed to be charged every 3 to 4 days for continuous measurements of physical activity (although Fitbits could work up to 1 week).

Office Visits as an Inhibitor

The recruitment and retention rates for Group 3 (those required to make multiple office visits for data collection and face-to-face interactions) were the lowest (Table 1). They reported difficulties in making multiple office visits because of transportation and parking problems and in finding time during busy daily schedules. We expected that multiple office visits would boost adherence to the intervention because of trust building through face-to-face interactions and clearer coaching and support provided by the interventionists. Moreover, the physiological measurements conducted in office visits (urine collection, blood pressure, and heart rate measurements) were expected to increase their interest in the study because these measurements could provide important health data. However, rather than boosting adherence to the intervention, office visits made them avoid the email reminders and, eventually, drop out of the study.

SUGGESTIONS FOR FUTURE RESEARCH AND PRACTICE

Based on the findings, we propose the following suggestions for future research and practice using Web-based programs to promote physical activity. First, further studies on the reasons for the issues that we discussed in this study are needed. The discussion points were just based on recruitment and retention rates, the minutes of research team meetings, and the researchers' memos, limiting the generalizability of the discussion. More in-depth qualitative studies among diverse groups of actual users must explore the issues discussed in this study. Second, the use of Fitbits could boost the recruitment

and retention rates of participants in Web-based interventions to promote physical activity. Specifically, the participants wanted to join the study because of Fitbits, which, in turn, helped their retention. Thus, researchers may want to adopt accelerometers, such as Fitbits, in their Web-based programs to promote physical activity. In this way, they could facilitate participant recruitment and retention while providing objective measurements of physical activity. However, the guidelines for the use of accelerometers must be prepared in advance.

Second, more studies on cultural attitudes toward physical activity, research participation, and Web-based interventions are needed. Because of culturally unique attitudes toward physical activity, the recruitment of Asian Americans into physical activity promotion research, especially Web-based intervention research, was challenging. When potential participants do not perceive their needs for physical activity, recruiting them is a challenge regardless of the types of media used for interventions. There were also subethnic differences in recruitment and retention rates, which may reflect subethnic disparities in cultural attitudes toward research participation. We suspected that cultural differences would have resulted in subethnic differences in the recruitment and retention rates, but we lacked the data to explore the actual differences. Further cultural studies could help reveal the subethnic differences and provide directions for future research.

Finally, as previously suggested by many researchers working with racial and ethnic minorities, the use of community consultants and leaders and culturally matched research team members would be essential in the recruitment of ethnic minorities regardless of the strategies adopted in Web-based interventions. The literature is clear that culturally matched research team members are essential in ensuring effective interactions while considering cultural contexts, minimizing harmful communications, providing reliable information and resources, monitoring and intervening potential liabilities, confirming a nurturing and supporting group culture, and monitoring and managing group interactions.^{37,38}

CONCLUSIONS

In this study, practical issues in recruitment and retention were discussed based on a Web-based intervention study to promote physical activity of Asian Americans using three strategies: (1) only Web-based intervention (Group 1), (2) a Web-based intervention with the use of Fitbit Charge HR (Group 2), and (3) a Web-based intervention with the use of Fitbit Charge HR and office visits (Group 3). The retention rates at the end of the first and third month were different among the three groups. Practical issues in participant recruitment and retention using the different strategies

included (1) difficulties in recruitment across strategies, (2) the necessity of using community consultants/leaders across strategies, (3) subethnic differences across strategies, (4) timing issues across strategies, (5) Fitbit as a facilitator with several hindrances, and (6) office visits as an inhibitor. As discussed, these issues could be confounded by multiple factors. Based on the findings, we suggest (1) the use of accelerometers in Web-based interventions to promote physical activity of ethnic minorities; (2) further studies on cultural attitudes toward physical activity, research participation, and Web-based interventions; and (3) the use of community consultants/leaders and culturally matched research team members in recruiting ethnic minorities regardless of the strategies used in Web-based interventions.

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