





# Evaluating a frailty education program implemented through barbershops/salons in Japan: A preliminary study

Sachiko Makabe<sup>1</sup>  · Katsuya Fujiwara<sup>2</sup> · Yu Kume<sup>3</sup>  · Midori Kaga<sup>1</sup> · Nobuko Munemura<sup>1</sup> · Shoko Kemuyama<sup>1</sup> · Kazutaka Mitobe<sup>2</sup>

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## Abstract

Although frailty has detrimental physical and psychological effects on elderly people, it is potentially reversible. In this study, we aim to evaluate the effectiveness of a pilot frailty education program implemented through barbershops/salons in Japan. In January 2018, we selected five barbershops/salons in Japan where customers were educated on frailty, which was classified as “normal,” “prefrail,” and “frail.” We developed a web-based assessment tool to reduce the workload for barbers/stylists. Participants included 45 customers (82% women), with a median (interquartile range) age of 53.0 (47.5–57.5) years, and a mean  $\pm$  SD BMI of  $22.3 \pm 2.7$ . Frailty scores indicated that 35% of participants were normal, 58% were prefrail, and 7% were frail. Frailty status scores reflected no significant differences after the intervention. Customers classified as frail were advised to visit the regional comprehensive support center for further professional frailty assessment. Participants, especially those aged over 65 years, found the web-based assessment difficult to use. In conclusion, a frailty education program implemented through barbershops/salons is possible because barbers/stylists can provide information on and assessment of frailty. Females and highly educated customers are more likely to be interested in participating. Nevertheless, a simple intervention is essential to expand the program nationwide.

**Keywords** Barbershop · Salon · Frailty · Health educator · Super-aging society

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✉ Sachiko Makabe  
smaka@hs.akita-u.ac.jp

<sup>1</sup> Department of Nursing, Akita University Graduate School of Health Sciences, 1-1-1 Hondo, Akita 010-8543, Japan

<sup>2</sup> Department of Mathematical Science and Electrical-Electronic-Computer Engineering, Akita University Graduate School of Engineering Science, Akita, Japan

<sup>3</sup> Department of Occupational Therapy, Akita University Graduate School of Health Sciences, Akita, Japan

## Introduction

Japan has become the world's leading super-aging society because it has the world's longest life expectancy and a persistently low birth rate (Suzuki 2018). In 2025, 30.3% of Japanese will be more than 65 years old and 18.1% will be more than 75 years old. By 2055, these percentages are set to increase to 39.4% and 26.1%, respectively (Cabinet Office 2018). The current system of long-term care includes governmental insurance to support healthcare costs, nationally licensed long-term care specialists to care for the elderly, and regional comprehensive care centers, as one-stop resources to address any concerns (Ministry of Health 2018). Nevertheless, this system is not robust enough to cope with the growing super-aging society of the future. Therefore, a novel system is essential for not only promoting their well-being but also maintaining their active social life, which is also included in the Sustainable Development Goals (Nunes et al. 2016).

Prevention of frailty is the cornerstone of successful aging. Frailty indicates the pre-disability stage and is associated with various negative health outcomes, including falls, hospitalization, institutionalization, fractures, disability, dementia, low quality of life, social isolation, and mortality (Duppen Rn et al. 2019; Rockwood and Howlett 2018). As frailty has a detrimental physical and psychological impact on elderly individuals, its potential reversibility has received increasing attention from scholars. Early detection of frailty in a population is necessary because of its nature. Frailty can occur not only in the elderly population but also at an earlier age. A large gap exists between the status of normal and long-term care. Thus, an outreach gap system is necessary to identify and regularly assess people in the community for seamless frailty prevention.

Currently, barbershops/salons are scattered throughout communities, and people visit them regularly. Leveraging these occupational-nature-related concentrations, barbers/stylists could facilitate the monitoring of health and offer relevant information to people, thus fostering the larger objective of improving community health. In particular, barbers hold people's trust because of their background in performing surgery during ancient times—historically, barbers served as surgeons (Van Dellen 2012). In the United States (US), barbers were trained to provide educational interventions for prostate cancer to African American men who disliked visiting hospitals, thereby raising prostate cancer awareness among the priority population (Luque et al. 2010, 2011). Numerous other studies have been conducted on barbershop/salon health interventions, especially in the US, in the areas of hypertension, skin disease, kidney disease, dementia, sexual health education, eating habit improvement, and physical activity improvement (Floyd et al. 2017; Linnan and Ferguson 2007; Linnan et al. 2011; Luque et al. 2014; Madigan et al. 2007; Releford et al. 2010; Roosta et al. 2012; Roy et al. 2018; Victor et al. 2011; Ward et al. 2016).

An international cross-sectional survey was conducted between March and December 2017 in Japan and Thailand to determine the feasibility of this barber project theory in Asian countries (Makabe et al. 2020). In Japan, more health promotion-related services were provided through shops, and health care awareness

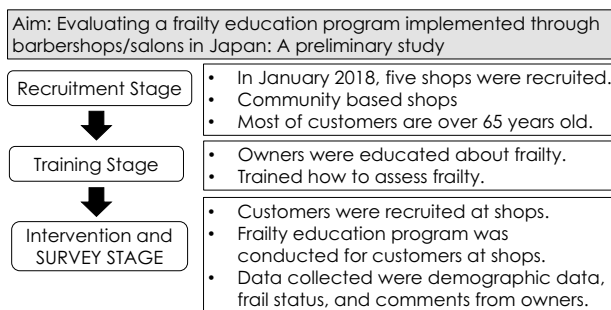
was higher than that in Thailand. A new concept of health care intervention through collaboration with health care professionals who provide community health education through shops was identified, thereby opening up the possibility of frailty education through shops, although this type of study has rarely been reported. In this study, a barbershop/salon setting was selected to provide frailty education to the community. The concept of barber projects to improve community health can be applied not only in the US but also in Japan. The Japanese barber/stylist license entails passing a national-level examination, and the curriculum includes detecting skin troubles and understanding general health conditions to maintain healthy hair. The educational background of barbers/stylists and their interest in general health provide a great opportunity to implement this barber-shop/salon project in Japan.

Akita prefecture is known to have the highest elderly population in Japan. In addition, the prefecture is reported to have a low birth rate, high depopulation, high mortality rate, and a low number of general hospitals (Statistics Bureau 2020). In contrast to other prefectures in Japan, Akita has the highest number of barbershops/salons with respect to population density (Statistics Bureau 2020). Consequently, despite its many challenges, examining frailty education in Akita is worthwhile, utilizing the strength of the high density of barbershops/salons. In this study, we aim to evaluate the effectiveness and challenges of a frailty education program delivered through barbershops/salons in Akita, Japan. The specific research issues that we seek to address are to identify (1) the frailty status of customers visiting barbershops, (2) the relationship between demographic data and frailty, (3) the effectiveness of the frailty education program, and (4) the challenges of the frailty education program at barbershops/salons.

## Methods

The entire methodological process is displayed in Fig. 1.

Design: Intervention design and preliminary pilot test.



**Fig. 1** Study process

## Setting and participants

In January 2018, five shops, comprising two barbershops, two salons, and one mixed facility, were selected to participate in a questionnaire study (Makabe et al. 2020) in Akita prefecture, Japan, a region with a high proportion of elderly residents. These shops were characterized as community-based for more than two decades, and most of their regular customers were aged over 65 years. One of the shops focused on providing home visit haircutting services with its barbers holding a health care license. All owners were educated about frailty and trained how to assess frailty. Education and training were conducted one-on-one by the first author of this study at the respective shops. Education included imparting knowledge on frailty, prevention of frailty, and information on the regional comprehensive support center near the shop. The training comprised an assessment of frailty and continued until the owner could perform the assessment accurately. The duration of this education and training program was approximately one hour for each owner. The effectiveness of this program was validated by the first author of this study based on owners' confidence and ability to assess customers' frailty during their visits to these shops. To participate in this study, customers were recruited between August and December 2018 by the owners. Inclusion criteria were (1) regular customers, (2) any sex, and (3) age between 40 and 79 years based on the existed evidence of prevalence of frailty (Kehler et al. 2017). In particular, pre-frailty can occur at an early age (Kehler et al. 2017) declining handgrip's strength (Abe et al. 2016) and walking speed (Bohannon and Andrews 2011) from 40's. Handgrip's strength and walking speed are crucial items for a frailty assessment (Dent et al. 2016; Fried et al. 2001). Therefore, the age interval for customers was selected to begin from 40 years. This study had no specific exclusion criteria. Moreover, shop owners could not afford to persuade customers too aggressively to participate in this study to avoid losing regular customers.

## Frailty assessment

A frailty assessment was conducted to check the improvement in frailty status and participants assessed as "frail" were advised to visit the regional comprehensive support center for further frailty assessment and enroll in a frailty prevention program. Five items were used for frailty assessment: weight loss, unintentional exhaustion, handgrip power weakness, slow walking speed, and low physical activity (Dent et al. 2016; Fried et al. 2001). The scores ranged between 0 and 5; 0 was classified as "normal," 1 or 2 as "prefrail," and  $\geq 3$  as "frail." For weight loss, participants were asked, "Have you lost more than 2–3 kg in the last six months?" For unintentional exhaustion, they were asked, "Have you unintentionally experienced continuous exhaustion during the last two weeks?" For handgrip power weakness, measurements used were  $< 26$  kg for men and  $< 18$  kg for women, with no dominant hand. Slow walking speed was assessed as  $< 1$  m/s. For low physical activity, participants were asked, "Do you exercise or play sports regularly?" The options for answers were either "yes" or "no." For slow walking speed, the official assessment required

2–3 m of walking (Muñoz-Mendoza et al. 2010). Considering the shops' space, a length of 3 m within shops was used to measure speed. The owners were taught how to measure and assess walking speed and handgrip strength. Measurement of frailty was conducted twice: once during the first visit and again when customers returned for a haircut. The duration between visits varied from one month to three months, depending on customers' duration between two haircuts, which ensured that customers did not need to visit the shop only to participate in this study.

## Demographic data

Demographic data included age, sex, height and weight to calculate BMI, education level, employment status, sleeping status, smoking status, alcohol intake, current medical treatment status, and the number of bodily pains. Physical activity was also assessed because of its strong relationship with frailty (Kume et al. 2019; Maekawa and Kume 2019). For physical activity assessment, a short questionnaire to assess health-enhancing physical activity and a self-report that required 3–5 min to answer was used (Makabe et al. 2015; Wendel-Vos et al. 2003). Using the international Ainsworth's compendium metabolic equivalents (METs) list, activities that were more than 2 MET were included to evaluate health-enhancing physical activities. Activity scores per week were calculated in the categories of "walk/bicycle for commuting," "light/intense for activities at work/school," "light/intense for household activities," "leisure time, including walking, cycling, gardening, and playing," and finally, "total scores of all categories."

## Interventions

For the environment, at each shop, a handgrip meter, a poster about frailty, and a leaflet about physical activities were displayed on the mirror in front of customers' seats during a haircut. Free use of the handgrip meter was allowed, regardless of customers' participation in the study, to increase their interest in participation as well as for their benefit. Although the handgrip meter was a tool for assessing frailty, its presence at a haircut shop and appearance was unique, raising customers' curiosity, thereby helping accelerate recruitment for this study.

The poster used for educational aspects included (1) an explanation of frailty and (2) how to assess it. The leaflet included (1) ideal physical activity level (Ministry of Health 2013), (2) how to improve it, and (3) detailed examples of physical activity depending on individuals' lifestyles. Increasing physical activity is essential to improve one's frailty status. Barbers/stylists acted as health educators and listened to and supported customers to help them understand the contents of the poster/leaflet. They also advised customers how to improve their physical activity. Researchers regularly visited and consulted shop owners to listen to and/or offer advice about any concerns during the intervention period. For motivation aspects, customers were offered a pedometer, which helped improve their physical activity awareness.

For technical aspects, a web-based questionnaire was developed (Makabe 2018) to reduce the workload for barbers/stylists. Our web system collected customers'

e-mail addresses for participant identification and providing graphical feedback. Frailty status was provided narratively, while physical activity levels were demonstrated through a bar graph as well as narratively through e-mail directly to customers. If participants were assessed as frail, the message of “a brief explanation of frail and recommendation of visiting the regional comprehensive support center for further frailty assessment and enrolling in a frailty prevention program” was provided. If participants were assessed prefrail, the message of “a brief explanation of prefrail and advice to improve physical activity” was provided. If participants were assessed as normal, that is not being frail, the message of “positive feedback of maintaining the status of no frail, and recommendation of further improving physical activity” was provided through e-mail directly and instantly to customers. Participants were asked to use the same e-mail address before and after the intervention to match the data. To address any potential security issues, an official information technology company registered as a privacy/security provider (16190236(01)) to conduct a standard security update or computer virus check, was used. User identification and password were mandatory to complete the web-based questionnaire. Only the initial researcher could access the uniform resource locator for downloading data using a specific identification and password.

## Analysis

Demographic data and physical activity scores were aggregated using percentage or mean  $\pm$  standard deviation. To identify the factors of frailty, the first assessment of frailty status was examined in terms of the relationship with demographic data and physical activity scores using Spearman's *t*-test or Mann–Whitney U-test, or chi-square tests, depending on the data characteristics. The pre- and post-intervention differences in frailty status were compared using a chi-square test. JMP 13 (SAS Institute) was used, and the significance level was set at  $p < 0.05$ . Lastly, comments from owners when visiting during the intervention periods were summarized using qualitative analysis.

## Ethical considerations

The study was approved by the ethics committee (registration number: 1764) and was also registered as a clinical trial at the University Hospital Medical Information Network in Japan (registration number UMIN000027869). Customers received a letter about the study's aims and methods, which also included the following information: (1) participants' privacy would be strictly protected; (2) refusal to participate would not influence customers' haircut service; (3) participation was voluntary; (4) the data would be presented only in an aggregated form in professional journals; (5) the benefit of participation was that participants could evaluate their frailty; and (6) the disadvantage was the time required to respond to the questionnaire. Returning a questionnaire was regarded as consent to participate in the study. A pedometer was offered to customers as a motivation

to participate and a handgrip meter, a stopwatch to measure walking speed, and a book on frailty were provided to shop owners as incentives.

**Table 1** Demographic data and physical activity score ( $N=45$ )

Contents	Number	(%)	Mean $\pm$ SD or Median (Interquartile range)
<b>Individual aspects</b>			
<b>Sex</b>			
Man	8	(18)	
Woman	37	(82)	
<b>Age</b>			
70 s	5	(11)	53.0 (47.5–57.5)
60 s	1	(2)	
50 s	23	(51)	
40 s	16	(36)	
BMI			22.3 $\pm$ 2.7
<b>Educational level</b>			
More than high school	28	(62)	
High school or less	17	(38)	
<b>Employment status</b>			
Yes	42	(93)	
No	3	(7)	
<b>Health-related status</b>			
<b>Sleeping</b>			
Can sleep	33	(73)	
Can't sleep or neither	12	(27)	
<b>Smoking</b>			
No smoking	41	(91)	
Smoking	4	(9)	
<b>Alcohol</b>			
No drinking	18	(40)	
Drinking	27	(60)	
<b>Current medical treatment status</b>			
No	22	(49)	
Yes	23	(51)	
Number of bodily pains			3.0 (0.5–5.0)
Physical activity score			4830.0 (2825.0–9335.0)

## Results

As illustrated in Table 1, 45 customers participated in this study. The majority were women (82%), employed (93%), had high school education or above (62%), with a median (interquartile range) age of 53.0 (47.5–57.5) years. Most participants could sleep (73%), did not smoke (91%), answered positively for alcohol intake (40%), and were currently undergoing medical treatment (51%). The majority of participants had pain in more than three body parts. The median (interquartile range) physical activity score was 4830.0 (2825.0–9335.0).

**Table 2** Relationship between demographic data and frailty status ( $N=45$ )

Contents	Frailty or Pre-frailty ( $n=13$ )	Normal ( $n=32$ )	$p$ value
Individual aspects			
Sex			
Man	5 (62.5)	3 (37.5)	0.67
Woman	27 (73.0)	10 (27.0)	
Age	53.5 (47.3–57.8)	53.0 (47.5–57.5)	0.83
BMI	21.9±2.3	23.5±3.3	n.s
Educational level			
More than high school	16 (57.1)	12 (42.9)	0.02*
High school or less	16 (94.1)	1 (5.9)	
Employment status			
Yes	30 (71.4)	12 (28.6)	1.00
No	2 (66.7)	1(33.3)	
Health-related status			
Sleeping			
Can sleep	23 (69.7)	10 (30.3)	1.00
Can't sleep or neither	9 (75.0)	3 (25.0)	
Smoking			
No smoking	30 (73..2)	11 (26.8)	0.57
Smoking	2 (50.0)	2 (50.0)	
Alcohol			
No drinking	13 (72.2)	5 (27.8)	1.00
Drinking	19 (70.4)	8 (29.6)	
Current medical treatment status			
No	13 (59.1)	9 (40.9)	0.11
Yes	19 (82.6)	4 (17.4)	
Number of bodily pains	4.0 (1.3–5)	1.0 (0.0–3.5)	0.08
Physical activity score	4725.0 (2280.0–9562.5)	5800.0 (3390.0–9265.0)	0.63

Data displayed either mean±SD, median (Interquartile range), or number (%); and are analyzed using a  $t$ -test, Mann–Whitney  $U$  or chi-square tests depends on their characteristics with significant level with \* $p<0.05$ , and not significant (n.s.)



The analysis of the relationship between demographic characteristics and frailty status using the baseline data (Table 2) revealed that educational level was significantly related ( $p=0.02$ ) with frailty—frailty status was confirmed to be higher among those with less than high school education than among those with higher education. Some trends were confirmed in the current medical treatment status and the number of body parts in pain. Individuals currently undergoing medical treatment and those having pain in more body parts had a high proportion of frailty status.

Pre-intervention frailty scores indicated that 35% of participants were normal, 58% were prefrail, and 7% were frail. As reflected in Fig. 2, a comparison of pre- and post-intervention frailty status indicated no significant difference ( $p < 0.29$ ). Some customers' frailty status improved or remained the same, whereas those of others deteriorated. Customers assessed as frail were advised to visit the regional comprehensive support center for further frailty assessment and enroll in a prevention program. Comments from barbers/stylists during this study were "I was confident to provide frailty education because health information was evidence-based"; "Better trust and conversation about health because of this intervention"; "Sometimes customers' families were interested, especially about home visiting service"; "Many customers were interested in using the handgrip meter but felt a considerable effort was needed to participate in the study"; "A web-based questionnaire was challenging for elderly individuals because of smartphone limitations as well as unfamiliar functions"; and lastly, "Customers who look unhealthy tend not to participate in the study."

## Discussion

The effectiveness and challenges of a frailty education program implemented through barbershops/salons were evaluated in Japan. In this study, barbers/stylists were well educated and able to provide knowledge on and assessment of frailty. Female customers, and highly educated customers were interested in participating in the study. Frailty status was identified and found to be unrelated to age. Further, the frailty status was not affected by the intervention. Nevertheless, customers assessed

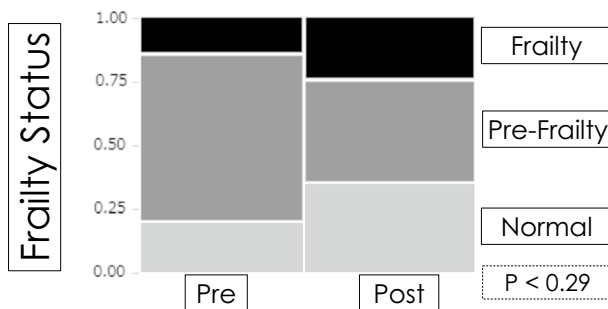


Fig. 2 Comparison of frailty status for pre/post-intervention ( $n=20$ )

as frail were advised to visit the regional comprehensive support center for further frailty assessment and enroll in a prevention program. The advantages and limitations of this barber/salon project, such as confirming the interests of customers, except for those appearing unhealthy, in preventing frailty, were identified for further development.

The characteristics of barbers/stylists in Japan indicate that they are nationally registered. Although their training concentrates on the health of hair and scalp, they are knowledgeable about hygiene, take pride in professional continuous self-development, and have a high awareness of customers' health as it relates to a super-aging society (Makabe et al. 2020). This type of frailty check can be performed either while waiting or during the haircut session. Barbershops/salons are a potential setting because of a lower bias than exercise classes in measuring frailty. Moreover, those aged in their 40 s and 50 s who are busy in social life can be recruited and assessed for frailty. Improving well-being in this study implied that once a barber/stylist realizes his or her value in an existing social role, an innovative universally usable service can be provided in their industry as a contribution to society.

However, several challenges, including expansion of the barbershop/salon frailty project, recruitment methods, education of barbers/stylists, feasibility of contexts such as targeted population/timing, mechanism of conducting the intervention, and setting an amicable outcome, were identified. Differences in geographic regions (north–south) and residential status (metropolitan–rural) need to be considered in addition to a randomized control trial design. The National Association for Barber/Stylist Network can be leveraged to engage shops through regular monthly newsletters or connecting with chief directors at the national or prefecture-level. Face-to-face education is not cost-effective and is time-consuming; thus, developing e-learning content is ideal. Those in their 50 s and above should be targeted as they belong to the second baby boom generation and will form an integral part of the second most populated and impacted aging society in 2055 (Ministry of Health 2018), although how to attract participants requires further consideration. Understanding the mechanism for the success of the project entails a realistic inquiry (Wong et al. 2013, 2016) by observing the US barber projects, and theoretical developments through expert meetings are crucial. Balancing the conflicts between the barber/stylist industry and the health care sector is important for generalizing this innovative idea. How much do we aim for is challenging: a bridge to fill a gap and produce new value for both sectors is possible.

In terms of limitations, this is a preliminary pilot study. Nonetheless, it represents a vital phase for the barber project in Japan. The sample size and methods are reasonable for pinpointing the effectiveness and challenges. To address issues of finance and time consumption, more grants and effective methods are necessary as the importance of social science increases (Editorial 2021). Lastly, for the second assessment of frailty, the participation rate was less than 50%. An attractive mechanism and a larger baseline sample size are required for the next phase of the project. Maintaining a certain duration of regular haircut timing is customer-centered (Linan et al. 2014), although various limitations exist individually. Finally, following the lack of improvement in the frailty status reported in this study, providing information and assessment of frailty is suggested to be beneficial for detecting frailty to

maintain community health. Improving the frailty status through barbershop/salon education is limited.

The significance of this study is that this type of barbershop/salon project to improve community health in Asia has not been reported and to the best of our knowledge, this is the first pilot study. As one of the main implications for community health and governmental policy, barbershops/salons can be established as a one-stop service for long-term care in Japan. The effectiveness of physical activity intervention is positive as it increases muscle strength and physical performance (Haider et al. 2019). As a barbershop/salon is an essential lifeline that remained open even during the outbreak of the coronavirus pandemic in 2020 (Saadat et al. 2020), collaboration with the health care sector is effective and beneficial. Moreover, barber licenses are registered by the Ministry of Health. The current school curriculum for barbers/stylists includes health, although it mainly includes scalp skin conditions, not aging issues. Extended discussion and understanding of each occupational background between the barber/stylist industry and the health care sector are required to drive and enhance this project. The official acceptability of citizens needs to be improved before introducing this project. To tackle issues in a super-aging society, long-term care and the creation of a new system are vital. Hair grows in any population. National finance is limited because of high costs for elderly people and low birth rates. Authorizing co-health educators by utilizing community resources is essential.

## Conclusion

A frailty education program implemented through barbershops/salons is possible because barbers/stylists can provide information on and assessment of frailty. Females, and highly educated customers are more likely to be interested in participating. Customers assessed as frail can be advised to visit the regional comprehensive support center for further frailty assessment and enroll in a prevention program. Further, consolidated nationwide research is compulsory for acceptability by citizens.

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**Author contributions** All authors contributed to the conception and design of the study. Material preparation, data collection, and analysis were performed by SM, KF, and YK. The first draft of the manuscript was written by SM, and all authors commented on the previous versions of the manuscript. All authors read and approved the final manuscript.

**Data availability** This study has no associate data.

## Declarations

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical statements** The study was approved by the ethics committee (registration number: 1764). It was also registered as a clinical trial at the University Hospital Medical Information Network in Japan (registration number UMIN000027869). Customers received a letter about the study's aims and methods. Returning a questionnaire was regarded as consent to participate in the study.

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