Supplementary materials

Supplementary Table 1. Guiding questions of the semi-structured moderator guide

Section 1: Feedback on the prototype telehealth education program

- 1. What are some differences between this session and other health education that you attended in the past, if any?
- 2. How do you evaluate the content of this session?
- 3. How do you evaluate the format of this session?
- 4. What are some challenges you faced in this session?
- 5. What are some improvements that you expect?
- 6. How are you going to apply what you learnt today in your life?
- 7. How do you accept this format of health education provision? Is there any change before and after this session?

Section 2: General health education and health information needs

- 8. Besides topics about frailty, what other topics do you think are important to you?
- 9. Can you recall any changes in your health information needs from the past to the present?
- 10. If you are offered a tele-education on these health topics, what formats (purely teleeducation, purely physical, or hybrid format), class size, frequency and duration do you prefer?
- 11. Do you have any concerns about tele-education?

Ending questions

12. Before we end this co-design workshop, is there anything that you feel is important but we didn't cover?

Supplementary	[,] Table 2. Detailea	l demographic	characteristics of	^f participants
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UID	Age	Sex	Ethnicity	Highest education achievement	Marital status	Living alone	Employment status	Personal monthly income (in SGD)	Housing type	Pre-existing health condition
P01	71	Female	Chinese	O-level	Single	Yes	Retired	0	4-room HDB flat	None
P02	64	Male	Chinese	A-level/Diploma	Married	No	Self-employed	S\$2,000 – S\$2,999	4-room HDB flat	Diabetes, Hypertension, High cholesterol
P03	55	Female	Chinese	A-level/Diploma	Married	No	Part-time	S\$2,000 – S\$2,999	5-room HDB flat	None
P04	57	Male	Indian	Postgraduate	Single	Yes	Full-time	S\$4,000 – S\$4,999	5-room HDB flat	None
P05	69	Female	Chinese	O-level	Married	No	Retired	0	HDB studio apartment for seniors	Diabetes, Hypertension
P06	66	Female	Chinese	O-level	Married	No	Retired	0	Condominium (excluding EC)	None
P07	71	Male	Chinese	Some secondary	Married	No	Retired	0	HDB studio apartment for seniors	None
P08	73	Male	Chinese	Degree	Married	No	Part-time	S\$7,000 – S\$7,999	3-room HDB flat	Hyperthyroidism
P09	68	Female	Chinese	O-level	Married	No	Homemaker	0	4-room HDB flat	Hypertension
P10	68	Female	Chinese	Degree	Married	No	Retired	0	5-room HDB flat	None
P11	63	Female	Chinese	Degree	Married	No	Retired	S\$4,000 – S\$4,999	Semi-Detached house	None
P12	64	Male	Chinese	Postgraduate	Married	No	Self-employed	S\$2,000 – S\$2,999	3-room HDB flat	Hypertension
P13	82	Female	Chinese	O-level	Married	No	Retired	0	5-room HDB flat	Heart disease
P14	60	Female	Chinese	A-level/Diploma	Married	No	Retired	S\$4,000 – S\$4,999	5-room HDB flat	None
P15	59	Female	Chinese	O-level	Married	No	Homemaker	S\$1,000 – S\$1,999	Executive condominium (EC)	Hypertension
P16	73	Female	Chinese	O-level	Single	No	Retired	0	4-room HDB flat	Hypertension High cholesterol
P17	56	Male	Chinese	A-level/Diploma	Married	No	Full-time	S\$2,000 – S\$2,999	4-room HDB flat	Moderate high blood pressure with medication
P18	62	Female	Chinese	Degree	Single	No	Retired	< S\$1,000	5-room HDB flat	None
P19	64	Male	Chinese	Postgraduate	Married	No	Self-employed	S\$3,000 – S\$3,999	5-room HDB flat	None
P20	63	Female	Chinese	A-level/Diploma	Single	Yes	Retired	0	2-room HDB flat	Diabetes, Hypertension, High cholesterol
P21	76	Male	Chinese	A-level/Diploma	Married	No	Part-time	S\$1,000 – S\$1,999	Terrace House	Hypertension
P22	53	Female	Chinese	Postgraduate	Married	No	Part-time	S\$4,000 – S\$4,999	3-room HDB flat	None

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P23	67	Female	Chinese	A-level/Diploma	Married	No	Retired	0	3-room HDB flat	Diabetes
P24	68	Female	Indian	O-level	Single	Yes	Retired	0	3-room HDB flat	None
P25	74	Female	Chinese	O-level	Widowed	No	Retired	S\$1,000 – S\$1,999	Condominium (excluding EC)	High cholesterol, Hypertension
P26	60	Male	Chinese	Some secondary	Single	Yes	Part-time	< \$\$1,000	3-room HDB flat	None
P27	72	Female	Chinese	Degree	Single	Yes	Retired	< \$\$1,000	5-room HDB flat	Hypertension, Cancer, High cholesterol, Fatty liver, Osteoporisis
P28	68	Female	Chinese	O-level	Married	No	Part-time	S\$1,000 – S\$1,999	3-room HDB flat	None
P29	72	Male	Chinese	A-level/Diploma	Married	No	Retired	< \$\$1,000	3-room HDB flat	None
P30	63	Female	Chinese	O-level	Single	Yes	Retired	< S\$1,000	3-room HDB flat	None
P31	68	Female	Chinese	O-level	Married	No	Self-employed	< \$\$1,000	3-room HDB flat	Diabetes, Hypertension, High cholesterol
P32	68	Male	Chinese	O-level	Single	No	Part-time	S\$1,000 – S\$1,999	3-room HDB flat	Diabetes, Hypertension, High cholesterol
P33	62	Female	Chinese	Degree	Married	No	Part-time	S\$1,000 - S\$1,999	5-room HDB flat	None
P34	70	Female	Chinese	O-level	Married	No	Part-time	< S\$1,000	Terrace House	High cholesterol
P35	65	Female	Chinese	Postgraduate	Single	Yes	Part-time	S\$1,000 – S\$1,999	4-room HDB flat	Diabetes, Hypertension

Supplementary Table 3. Sample quotes regarding participants' perceived impacts of the prototype

Theme	Sample Quotes
The tele-education prototype helped participants acquire deeper knowledge about dementia, corrected some misconceptions, and increased	"I'm new to dementia, because I haven't come across any of my relatives having dementia before. At least I learnt a lot today." – PO2
their awareness.	"I think some of the topics discussed are quite eye-opening, some can be applied, some can be learned, some also can be shared with your friends, especially 1 in 10 Singaporeans have dementia, and something we mentioned that is interesting." – PO4
	"I think you chose a very good topic for mental wellness, especially during this covid period. A lot of people are feeling lonely, and mental health is really something that is really affecting a lot of people. So I think you chose this topic is very good, and it's something that is quite new, and we are all learning, and I think overall I would say I do learn a lot about dementia today." – P06
	"Maybe there are some resources around us, but maybe we are not aware. We don't bother until I attend this tele-education, that's where awareness comes in Iah." – P12
	"We have a general sense of the illness, but we don't really understand the details and sometimes we could give the wrong answers because we thought we were right. I like your set of questions than true and false because it cut the answers very well exactly what it meant rather than a general one." – P19
	"I think the content is very educational. [There are] a lot of things we heard, but we are not sure. [It's] informative. After attending this, we are more sure and assertive Actually, what you are doing now is actually related to what P22 said, how to recognize misinformation on dementia. But now we are more sure. So when we talk to people we are more assertive. It depends on what we are doing, and sometimes we need to be better in certain topics." – P21
	"By answering these questions, first of all you can know how much you know about it, whether it's right or wrong. Actually, by reading the questions, I actually have a wider view of what it can and may not be. I mean so far dementia people who suffer this and that, but we never look into those questions you give us, we never look more in depth like those questions. We just say okay this person has dementia and he/she is doing this and that, we read in newspaper that people are getting lost, that's it. By doing those questions, we can sort of understand better and know okay, this is what it is all about." – P24

The tele-education prototype aided participants in gaining a more profound comprehension of people with dementia and the responsibilities of dementia caregivers, which in turn could enable them to communicate more effectively with other people.		 "Initially I could not answer a lot of questions so I put "unsure". But after attending after you have explained, I find that I'm able to answer some of the questions accurately, then I say well it's good for someone who doesn't know anything about dementia." – P28 "Basically look out for, like you say, now I'm equipped with this knowledge, I will not purposely or make it so obviously "Are you ok or not ah?" I won't purposely go to look for dementia people. But just understand the caregiver, you know sometimes I see caregiver pushing the dementia patient or whatever, now I understand why because they [the caregivers] themselves are frustrated, they can burn out also, they are human beings. [This session] is more eye-opening, and I will see how I can help to understand the caregiver and dementia patients, and apply what I learnt today." – P12 "For me, I'm a volunteer to interview the seniors. So I recently came across one, I think she has dementia, so I want to know more about this so that I can understand her behavior." – P13 "For example, as a volunteer, now I'm able to communicate better because I understand more on this topic. Caregivers actually are very stressed, especially in their family, the spouse has to take care of another
		spouse, and you know between spouse and spouse they take things for granted. So that's why people want to send the patient to the nursing home, it's because of this reason, because they find it very difficult to communicate, they just don't want to listen, but they will listen to another person but on the same thing." – P21
	1	"Speak and treat kindly daily to dementia patient and join dementia support group." – P26
Participants would like to apply the knowledge acquired to	motivate their learning	"I want to know more about dementia. I think a lot of people are concerned, especially my group of friends, they are very worried." – P21
		"I actually pick up some very good points that I can use for myself to do some self-assessment, or I am given information that I can actually further explore on my own, if I want to go slightly further, because this topic is a very common topic, and is a topic that is of much interest to people aged 65 and above." – P27
	enhance their self- care practices	"For me, I find the session very informative, [covering] how to prevent and what are the early symptoms, so that we ourselves are aware and take note of all these things, as well as the people surrounding you, [like] our family members. We are ageing, but not only we are ageing, [but] our family members are also ageing, we have to be aware of the signs, symptoms of all these things, and to prevent, and if we find out that

	there is [diagnosis], then we have to prevent it for further deterioration. So [it is important to] take precaution." – P03
	"Eat healthily, sufficient sleep, and also walking exercise, healthy living!" – P05
	"I think all the preventive measures we mentioned are useful, like keeping ourselves active physically as well as mentally, that's the thing I learnt today lah." – P06
	"I think I need to stay socially and mentally active. If any of my family members get dementia, I will know a little bit better how to take care of them." – P23
	"I agree with P25 that we should stay active, and we can pick up something like arts. I volunteer with the Sports Hub and try to walk every day and meet people, young and old, go out for lunch and all that. And I learn languages, I learn French, Italian, German and Mandarin. I can play a little bit of piano, I'm learning piano. I'm learning ukelele. I read books, and I try to go out. I cannot stay home, I'm so lonely, and this may lead to dementia haha. I have a group of friends, I go with my ex-colleagues, some of them are older than me, some are younger than me. So we just meet and then have lunch and talk and talk. Yeah, laughter is very important because [if] we cannot laugh and smile, we feel miserable, then out life is miserable, and it may lead to dementia!" – P24
	"Going to a healthy lifestyle, have to make more small efforts, have to go out more often. If possible, maybe we can take some short courses, maybe in art, drawing, etc. And keep the mind active. Some people do volunteer work." – P25
	"Actually, today one is a very good lesson, and another thing I like to share is my own momSo now what I feel the most important thing is what the doctor said "you retired, you cannot sit at home and watch TV, you have to read, not only read but also read it out to make your brain work. Sometimes even nowadays I have this memory problem, not so good now. I'll try to recall and make my brain work, this is what my doctor told me. I think we need to do is to exercise. I retired in 2008 but I keep doing stuff, freelance or admin [jobs], and if I have the time I will hit the gym every day; if not at least every other day. This is what I can do for myself now to keep myself healthy. I make sure I have lots of things to do, even at home. I'll try to draw something, and I'll try to make my brain work." – P34
share the	"We can call people to look out, especially in the ageing society. We can also share the tips [on how to
information within	reduce the risk of dementia] with my friends. I am already doing some of the checks like going for checks,

their social network	but I never know all these can also contribute to dementia, and diabetes, high blood pressure can also contribute to a higher risk of dementia. Now I know, so I can tell my siblings and friends to go to check also." – P04
	"Right now everybody hopes to be healthy, but how? Eat well, how? Exercise, how? We know in words, but how do we go about it? So if we can teach or show people the steps [of] how to build muscle, okay this is what you're gonna do, then it may motivate people, oh this is how, not that bad, not that difficult, so I start doing it. Because you can tell me eat healthy, so what? You know but you cannot apply. Knowledge must go into action, and action can be one step at a time, considering now we are talking about the older people right? So one step at a time, one step at a time, then gradually they get used to it." – P11
	"Actually, it will help, because there are many people who are in contact with people with dementia. They don't know what to do, they are actually quite lost. So that the little [things] we know from today's session, we can share with them." – P24
extend assistance to those in need	"After you tell me all these and listening to so much information and knowledge, emotionally I feel I can do more, maybe volunteer." – P12

Supplementary Table 4. Sample quotes regarding participants' ability to carry out the activities in the prototype

Theme	Sample Quotes
Most participants could follow the instructor and did not encounter any	"I didn't come across any challenges." – P08
difficulties.	"I'm comfortable with this." – P09
	"I think it's quite simple" – P11
One participant reported occasional Wi-Fi instability.	"For myself, I don't know whether you noticed just now I got disconnected for very short time twice. Maybe it's my connection issue here, so I was lost for 1 or 2 mins at that time just trying to connect." – P30

Supplementary Table 5. Sample quotes regarding participants' satisfaction with the prototype and perceived appropriateness in the local setting

Theme	Sample Quotes
All participants expressed satisfaction with the tele-education prototype and	"Basically I find the information here is quite clear, very direct, easy to understand" – P04
found it easy to understand, although most of them were new to tele- education.	"Assume that I have enough time, then this format is okay, because if very comfortable to sit and home and do Zoom. This is the first time I really do something on Zoom for so long, I've never really done it on Zoom before. I managed to keep myself occupied on Zoom. It is something new I learnt." – P05
	"To me, I think both ways are ok. I prefer this, if this is the mode for communication over zoom, I think I would rather choose this option [rather than] go for physical or on-site." – P06
	"I agree with P11 that I'm very comfortable with zoom because it really saves time, saves transport. Each time I attend a one hour activity or half an hour activity, if I have to go onsite, it's actually one whole afternoon wasted. And we have so many events back to back sometimes, if it is with zoom, you can go through all the zoom sessions because they are back-to-back. No time [is] wasted on travelling. But if you have to do it onsite, you probably have to accept only one of the session and maybe you have to cancel it. So for me Zoom is very comfortable." – P10
	"Actually, for me, I am really quite happy on Zoom. In fact, the COVID actually created a lot of good things for me. I mean as far as I'm concerned, some people like to go out, I don't like to go out, so I take up a lot of courses whenever it's on Zoom, because I find that it really saves a lot of time and personally for me having a zoom education, I really like it because I find that travelling out is really a lot of time taken, and even telemedicine, when I go for blood test, all the doctor need to do is to just call me and tell me my result and explain to me. I really like [it, I] think it's a fantastic idea. Otherwise we have to travel to the hospital, wait for half an hour or one hour for the doctor to tell me the same thing, whereas I can stay at home and just talk to a doctor for 10 or 15 mins. So if you ask me if telehealth program, teleeducation program is good for me, I like it. It saves up on my traveling, I don't have to travel, it saves a lot of time. Especially for us women, we have a lot of things to do at home on the day." – P11
	"Tele-education is ok, you can go even more high-tech." – P12
	"I also feel that [tele-education] is very convenient, I don't have to go here and there, I can just stay home." – P13
	"I think it's good overall, it's a good introduction I think it [your prototype] is very good as a basic education program for people to have this awareness." – P18

	"I'm very happy [about tele-education]." – P21
	"Generally, if it's just conducted in a simple way I think it's okay like this, there is no stress on us, so we are very comfortable. Today one is okay, comfortable." – P32
	"This zoom session is very very good." – P34
Some participants shared that their daily schedules were packed with household chores or caregiving duties, making tele-education the ideal choice for them.	"For me, I like Zoom a lot, as what the other 2 participants mentioned. but let's speak on behalf of my husband, he is a chronic patient, actually I always wonder why this tele-education thing cannot be open wider to people like him I actually stopped work, so I don't earn anything, I don't have the income now because of my husband because I accompany him wherever he goes for hospital appointmentsNow it's also hard for me to go for physical ones because every time I go out, I have to make sure there is someone around at home. Otherwise, as P10 and P11 said, half a day is gone just to attend a one or one and half hour session physically. If it's all under this tele-education, then it rally saves a lot of precious time and money." – P09
participants anticipated the integration of health promotion campaigns with tele-education to enhance the impact of dementia awareness initiatives, for example, 1) organizing regular health promotion events and reaching out to less	1) "Is there a particular date we set it to promote dementia in Singapore or in the world? It would be good during this period [to have health education], because most of the working people will be so drawn in their working life, the awareness of their parents and relatives developing such signals will not come to an awareness until things happen, then it may be too late. So if the government could systematically educate people through all these different diseases, this kind of activities will help to remind people every year like the Valentine's day. Every year you have a promotion that talks on this topic will help to bring about awareness and bring people to learn more about these signals." – P19
engaged older adults, 2) incorporating free or subsidized dementia screenings into annual	2) "Do you think any healthcare, hospital, or institution can give us discount or voucher for cognitive screening for dementia? If the early screening of dementia can be incorporated into the healthy screening, it's a good idea. – P05
medical check-ups, and 3) designing a tag for individuals with dementia to encourage public	"Like what we have this year, they checked for chronic diseases like 3 highs, if they can include this dementia screening into the yearly health screening for the seniors, I think that will be good." – P06
assistance and support when needed.	"I just want to say whether there is a possibility to add on to our those functional assessments and screenings." – P09
	"I think increasingly over the last 10 years, a lot of talks about dementia, so I think a lot of people gradually know more about dementia a little bit here and there, and maybe we experience family members or friends having dementia. So I think knowledge alone may not help, [but] if you make it a compulsory kind of add-on to our health check, that will be a good start, then it's not just information but action also. If you leave to everybody "okay, it's up to you whether you want to check or not", then nobody will want to check. But if you make it maybe not to spend money on MRI/CT scan,

because those are expensive, but at least the basic first, maybe cognitive tests. After the cognitive tests maybe there is some suspicion that you are getting dementia, then the next level will be probably some other tests before the CT scan, or maybe go straight to CT scan, but at least a preliminary so-called, since this is so common right, preliminary, compulsory kind of a test during a health screening. It's just like the blood test, everyone goes for the 6-month blood test." – P11
"They [the current annual health screening items] don't extend it [dementia screening] to us." – P13
"Just now the lady mentioned about dementia screening, and this should really be part of the annual screening now. It's a very important topic." – P28
3) "For people with dementia [especially for those whose conditions are] severe, do they have a tag so that people know if they are lost. But I think it would a very good initiative if we can do it and write their caregivers' names, contact numbers, or even home addresses [on the tag so we can help them]." – P08

Supplementary Table 6. Sample quotes regarding participants' perceived possibility of expansion and demand

Theme	Sample Quotes
All participants believed that such education could increase their awareness about dementia, facilitate early precautionary measures, and empower individuals to provide better care for their loved ones.	See Supplementary Table 3.
Participants expressed the desire for the prototype to evolve into a comprehensive tele-education program.	"This topic is a very common topic, and is a topic that is of much interest to people aged 65 and above. I think behind our minds, we have this question "Will dementia actually hit me?" so this being the kind of general environment, I suppose if you put it into the telehealth education program, it should be very popular and welcoming." – P27
Besides dementia, participants expressed their desire to incorporate a broader range of topics into the tele-education program.	 Silent killer diseases (e.g., high blood pressure/hypertension, diabetes, high cholesterol, cancer, osteoporosis, blood circulation, and cardiovascular diseases) Eye diseases Skin diseases Kidney stones & gallstone Frailty and mobility Mental health Nutrition and healthy cooking, Simple home exercises and muscle building Vaccination Supplements Caregiving tips Traditional Chinese Medicine Quality information searching

Supplementary Table 7. Sample quotes of the SNOW (strengths, needs, opportunities, and weaknesses) analysis result

Category	Level	Theme	Sample Quotes
		Convenience - comfort	"For me, I prefer online, I can sit in my comfort." – P03 "I think for me, this tele-health education program online saves us the time to go down to the site to do it. So, on that it saves our time, and you do it at the comfort of your own home, so that is the pro of having tele-education over zoom. To me, I think both ways are ok. I prefer this, if this is the mode for communication over zoom, I think I would rather choose this option [rather than] go for physical or on-site." – P06
Strengths	Technology	Convenience – time- efficiency	"I think for me, this tele-health education program online saves us the time to go down to the site to do it. So, on that it saves our time, and you do it at the comfort of your own home, so that is the pro of having tele-education over zoom. To me, I think both ways are ok. I prefer this, if this is the mode for communication over zoom, I think I would rather choose this option [rather than] go for physical or on-site." – P06 "I agree with P11 that I'm very comfortable with zoom because it really saves time, saves transport. Each time I attend a one hour activity or half an hour activity, if I have to go onsite, it's actually one whole afternoon wasted. And we have so many events back to back sometimes, if it is with zoom, you can go through all the zoom sessions because they are back-to-back. No time [is] wasted on travelling. But if you have to do it onsite, you probably have to accept only one of the session and maybe you have to cancel it. So for me Zoom is very comfortable." – P10 "Actually, for me, I am really quite happy on Zoom. In fact, the COVID actually created a lot of good things for me. I mean as far as I'm concerned, some people like to go out, I don't like to go out, so I take up a lot of courses whenever it's on Zoom, because I find that it really saves a lot of time taken, and even telemedicine, when I go for blood test, all the doctor need to do is to just call me and tell me my result and explain to me. I really like [it, I] think it's a fantastic idea. Otherwise we have to travel to the hospital, wait for half an hour or one hour for the doctor to tell me the same thing, whereas I can stay at home and just talk to a doctor for 10 or 15 mins. So if you ask me if telehealth program, tele-education program is good for me, I like it. It saves up on my traveling, I don't have to travel, it saves a lot of time. Especially for us women, we have a lot of things to do at home on the day." – P11
			"Tele-education is more convenient for the participants because they can log on to the laptop anytime, they don't

			have to travel to the location. Because if you are doing a physical one, then we have to travel to the place and there is a time wastage. [Tele-education] is more efficient." – P22
		Friendliness to people who are shy	"For online sessions, if I'm very shy to speak, so I just type into the chat. Maybe one advantage of online is you can type if you are shy to speak or unmute [yourself]." – P12
		Better focus & less distractions	"And the information is more targeted, because sometimes in a physical environment [people] can get easily distracted right when somebody is beside you or they are eating? But now we can just find a quiet place and do this tele-education. I think the concentration for the participants, for me in particular, is much better." – P22
			"Face-to-face [education] also has its own advantages, you already see the person in-person, then interaction is there lah." – P03
			"There is interaction physically, maybe we are the old-fashioned type."– P05
	Human – older users		"Of course [for] physical [sessions, there are] more interactions, in the sense that the person can have eye contact, can see more things, and can do the activities together, more interactions lah. Online [sessions are] quite difficult, but still can be done." – P12
Weaknesses			"I also recognize that some people prefer onsite where they can actually see it, and can ask questions, better for interaction, then perhaps some sessions can be onsite. For food, I think there are many things can be shared for food, you can have some cookery class to show people how they can prepare nutritious food for the family as well. It's not just for the patient." – P18
			"But by talking and listening from others, then there is some kind of we can retain something, so more interactions." – P24
	i s F	Lack of immediate support, particularly	"Btw I cannot see the "CHAT" button, I don't see anywhere I can actually write. So what I mean is that sometimes the small issues come up, unless you get someone that can help on the spot. But if not, then you wouldn't know how to do it." – P30
		when users are alone	"it's quite general. It depends. you have to adjust the pace [so that] the person is able to learn. If the person is a slow learner, then the person who conducts [the session] has to guide and encourage him, you don't leave him

	Technology	Reliance on the internet connection	behind. Otherwise he will not complete the course. Whereas in the class, let's see if the person doesn't know, they will turn around left and right and try to catch up, you know [that he has some difficulty following]. But alone in the room, you have nobody to guide you, so that's a difference." – P33 "I don't have Wi-Fi, I'm using telephone data. I have 20 GB every month, so I reserved 15 GB for today's session. I didn't use my phone much this much and reserved my data for today's session Yes it's acceptable, provided that I still have the data." – P05 "For myself, I don't know whether you noticed just now I got disconnected for very short time twice. Maybe it's my connection issue here, so I was lost for 1 or 2 mins at that time just trying to connect." – P30
		Usability challenges posed by small device sizes	"We are seniors and we may consider the font size [in zoom poll] small lah. Another thing is that we can enlarge it lah to change our text feature, because before it's small. Sometimes we may not see some parts [on the slides] due to resolution problem, so maybe you need to get the resolution right fit the screen size." – P12
Needs	Health education design - content	Tailored content	"Because it's very hard to get the audience that is of the same standard, so if you just do a public announcements that come and listen, you will have all kinds of people, some catch it [and] some don't catch it. So that's my view. So if you want that tailoring, you can approach these organizations, mainly the family centers or social centers, so they have their own group of same standard of seniors." – P11
		Evidence- based content	"And it's also good that you quoted some research to support what you say, so that we know the information is reliable. I think it's quite easy to understand, no technical words." – P22 "[We can have more such kind of sharing], but not from TokTok or YouTube, because sometimes it's all non-sense. It should be real news." – P24
		Correction of misconception	"I think it's actually quite good even for other form of tele-education on other illnesses like osteoporosis, because we have a general sense of the illness, but we don't really understand the details and sometimes we could give the wrong answers because we thought we were right. I like your set of questions than true and false because it cut the answers very well exactly what it meant rather than a general one. Because a lot of people just generalize a lot of things, and then they let it be because that seems to be the way health educations are portrayed in the media like newspaper. They give very general idea, but they don't really go to specific. But your set of questions cut it very clearly whether it is on the right or on the left kind of things, so I like them. Maybe you can work out something

		which allow us to have that kind of listing of questions which actually it's also good to use it as conversation starters among friends, I mean I would probably use that the next time I meet up with my friends and then talk about what it is. a lot of people try to give a general idea of the illness, it will be good to actually correct the people that this is what exactly it is." – P19
	Constantly updated content	"The content is very important. Fortunately we are a bit more educated, we are a bit more receptive to what are you telling us, and we [are] also hungry for knowledge especially these are very relevant, actually more for the retirees or for the elderly. I think your content must be forever evolving, there is always something new, and then that would attract us. Because if I can find it on google, I don't come to you already." – P21
	Medical information & actionable health tips	"I think [more disease-related medical knowledge] will be good. You know the existing program like diabetes education, they actually do a lot in the area of education diabetics how to look after themselves, how to give injections, how to take care of medication, diet, etc. Those are quite hands-on kind of education, they really educate until the person knows as much as a healthcare personnel, so I think the diabetics themselves are quite motivated to learn. I'm not sure whether for this one is pre-diagnosis, you know you want to educate them when they are still young before the onset of dementia. So it's the kind of approach possibly might be a bit different, because the other one the diabetics they are already diagnosed. So you know they are very motivated to learn how to handle their own illness, but for this one they may feel I'm extremely well, why I need to learn all these things, so might need to find ways to overcome this kind of objection." – P10
		"Can we have it on both medical and lifestyle?" – P12 "My challenge is what I'm going to do next, but now I know. Sometimes I wanted to do but as you say I don't want to put it into practice, then [it] can be a challenge." – P21
Health education design - language	Multiple languages	"Because this is basically in English right, it is also good to [adapt it to cover] other older populations to cover the other 3 official languages, so there is a wider reach, rather than just English-speaking ones. Maybe different sessions for different languages, because some people may prefer Mandarin, Malay or Tamil, so you cannot have all of them in the same session, otherwise it becomes very difficult to teach. So you may want separate sessions for Mandarin, Malay, or Tamil speakers. I'm talking about the 4 main languages, of course we cannot have all languages. If you cannot have 4 different sessions for different languages, then maybe can have different subtitles in different languages. But these are quite important information that you want people to know actually." – P04
		"If you are aiming for the general public, maybe Mandarin is a better language than English." – P08

			 "And also they probably, unless you have it in Mandarin, or Malay or something, I think English is quite limited among the seniors." – P10 "Not everyone understands English right, a lot of seniors are dialect-speaking or Mandarin-speaking, so not everybody understands English lah." – P11
			"You said not everyone can understand English, then Mandarin is very very varied depending on where they come from, is there a possibility of being just simple mandarin language? And in your faculty, maybe people who know Cantonese, Hokkiene, don't give them a very deep [difficult document] like what you give us the slides all that, just talk to them, and talk to the ambassadors there, some may be able to speak Cantonese, some may speak Hokkien, some may speak Malay, can just give them the simple thing, not factual knowledge. I don't think they want all this knowledge. Just have some conversation, give them some outline of it, and say if you want anything you can go to this place, if you are not so sure you can go there. I'm very sure people are receptive, they really need help. Just give them some informal ones. So if you ask me what I see just now [in the session], I can only tell you some. So just general normal layman conversation! They will understand if it's in their language." – P24
		Simple language	"Certain things need to [be] memorize[d] like some technical ones, that one you must explain then we understand. So memorize keywords, but please explain then we get it, we absorb it lah. Certain keywords must [be] memorize[d], but explanation helps." – P12
			"I think it [the prototype] is quite easy to understand, no technical words. But it's not too simple, we can get the message effectively." – P22
e d	Health education design - delivery	Reducing cognitive load	Duration "The other thing is I think if telehealth is on the phone, it might be a bit too long because for example we spend about one hour, but I think if you really use [tele-education] maybe half an hour lah, holding their telephone and listening to all these may not be so appropriate." – P11
			"Tele-education is very targeted, but then the span of our focus [is not long], so you should not make it too long. Too long it won't be good lah. I think maybe one hour is good enough. I'm saying that our focus [is only 1h], after 1h we don't know where our minds go already. Especially at home, because [on] zoom, you are in another environment, so

we have priorities in attending to other activities, and then halfway they will disappear. 1h very focused is very good to learn, if they know they are able to learn within a very short period, then they do like to spend their one hour." – P21
"But as P21 mentioned, keep it short and sweet, because after a while our minds tend to wander. I think it's about right." – P21
<u>Presentation – multimodal texts</u>
"I'm a person who would love to read, so for me the content is very good, very informative, thanks for that. However, keep in mind that some of us are very visual, so besides the words you can have more pictures to keep them awake. Because it's online, you need to attract your learner, so make your presentation more attractive, insert some videos, pictures, music, maybe some music, maybe some video clips. That would be good" – P03
"it's too wordy, too much words [and] no pictures. After a while you read [and] read, you are very tired. Maybe it can be intermingle with some pictures, real-life pictures, or maybe a short video clip to emphasize some of the points, that would be more interesting with more visual elements, [it will not be very] static." – P04
"But I think many of the other telehealth education programs use a lot of diagrams [but] not so many texts. So it really depends on your audience, to some maybe this is too brief, but some others they may not be able to follow. Maybe videos, role play in video will be good, a bit more visual. For me, it [the language used] is ok, [but] I don't know for other seniors, whether it's easy for them or not. Maybe you want to test it out." – P10
"Because you know, a lot of seniors really cannot [read texts to follow], some of them may not be able to understand so many words, so I guess [it is] not easy for older people to understand. So visual is very important" – P11
"But online, I would prefer to have a lot of visual images, because I'm left-handed and I'm a very visual guy. I see pictures I remember better than just using PowerPoint, and then sometimes the PowerPoints, wah seven eight points I cannot remember ah, I must take photo eh. So maybe short PowerPoint with visual images, pictures would be very helpful." – P12
"For your tele-education, there are a lot of texts, videos might be more informative, because I think some of the explanation may actually be more vivid and clear. If you could [find] some form of a video of the behavior of the

Motivating older	 person, but of course you may have to obscure the face and so on for protection of that person. I mean it helps to actually illustrate the form of behavior [that] dementia people may resort to, rather than just words. I mean it [text] does convey a sense of what it is, but I think some videos, maybe some pictures can be more informative in that sense." – P19 <u>Content – incorporating real-life experience of people with dementia and their caregivers</u> "I'm sure in your other groups there may have been participants who are actually in direct contact with people with dementia, and they can actually share more the help. Maybe you and the other participants [can share] because there is real-life experiences." – P25 "I think the last suggestion another participant mentioned [adding in the sharing of first-hand experience on taking care of dementia people to gain a better understanding of why it is so important to do early screening, early treatment, and early intervention] would make the session more interesting and more related to reality." – P27 "I think it will be good if we have [something] like the caregiver or somebody in the profession of taking care of some dementia patients, to at least participate a bit, maybe in the background as a participant to listen to what we commoner do not have real experience in, and then after that she can give us some pointers to look out on." – P35 "You know the existing program like diabetes education, they actually do a lot in the area of education diabetics how to look after themselves, how to give injections, how to take care of medication, diet, etc. Those are quite hands-on kind devente until the nerve are much as a hardtheare partecapel, can then then the participant can be divente on the participant and the parter participant on the
audience	kind of education, they really educate until the person knows as much as a healthcare personnel, so I think the diabetics themselves are quite motivated to learn. I'm not sure whether for this one is pre-diagnosis, you know you want to educate them when they are still young before the onset of dementia. So it's the kind of approach possibly might be a bit different, because the other one the diabetics they are already diagnosed. So you know they are very motivated to learn how to handle their own illness, but for this one they may feel I'm extremely well, why I need to learn all these things, so might need to find ways to overcome this kind of objection." – P10
Preparing sharable content	"If this is something that can be available online where you can access any time, and you can use that to share with your friends or whoever you need to share. So you can have a platform to share rather than you have to attend the session in order to learn [the Zoom link can be shared with others, not like the physical sessions which need registration to attend]." – P04
	"Not sure whether we will get a copy of what we learn, because I think it's very interesting that I keep this at hand, and every time I forget I can go back and read, eh you must do this must do this. I'm not sure if we can get a copy Iah. I'm actually taking notes." – P12

		"[By] having the physical copy, at least I can remember [the knowledge]. At the end of the year, somebody talks to me about dementia, I won't say yeah I attended it, and I forgot what she said about it. If I have the thing [the physical copy] in my phone, I can give people something from what I can recall, or at least I can talk and say by looking at that, I can actually recall what you said. But if I can't recall the main points, then I still can recall what you said. Actually, it will help, because there are many people who are in contact with people with dementia. They don't know what to do, they are actually quite lost. So that the little [things] we know from today's session, we can share with them. I think the hardcopy you showed us just now right, at least we have something to talk and share with them." – P24
		"And one thing I can envisage is that it's on an online basis, you can actually do it on your own, meaning pre- recorded it and it is played out, and it can become something like a self-help instrument or exploration. Because if I have an issue, [for] most of us the first thing is go and find information, how should I approach to solve the problem or something like that. So I see the potential here for this kind of approval, it helps the individual to do problem- solving." – P27
Human - older ad		"Before covid, we were comfortable and we would like to interact with people and we go face-to-face. But since Covid, we learn how to go digital because we cannot go out that time and we learnt that online is much better. I mean the time we were forbidden to meet each other so we learnt that actually through this method it's better and at our own comfort, just access and we could interact with people, and we can see each other actually. So it's better. We don't need to go out." – P03
	Technical support	"For myself, I don't know whether you noticed just now I got disconnected for a very short time twice. Maybe it's my connection issue here, so I was lost for 1 or 2 mins at that time just trying to connect. Btw I cannot see the "CHAT" button, I don't see anywhere I can actually write. So what I mean is that sometimes the small issues come up, unless you get someone that can help on the spot. But if not, then you wouldn't know how to do it." – P30
	Preparing prior to the session	"It will be good that the person do some read-up before participating the program, I think the questions asked will be more in-depth and maybe more specific to what they are looking for to get an answer from the program itself." – P33
Human - health educator	slow learners	"Sometimes I don't know which one is the correct answer, so I just estimated, agar agar [an estimate] yah. I try to do as best as I can. After listening to you, I still have doubts. Maybe [it is because] we already have a mindset, so could not absorb the reality so fast." – P25
		"In tele-education or Zoom education, the person that conducting it must be able to seize whether everybody

		follows, some are slow learner, so he has the help the person along. Otherwise, after a while he'll be lost. And if he asks too many questions, he may hold everybody up and he may not be comfortable to us. So the understanding by the educator is very important. Otherwise after one lesson that person would not want to join anymore because he is lost. So helping the weak [learner] along is very important." – P32
		"you have to adjust the pace [so that] the person is able to learn. If the person is a slow learner, then the person who conducts [the session] has to guide and encourage him, you don't leave him behind. Otherwise, he will not complete the course So if you think that you are going too fast to catch sometimes, then you have to slow down and try to guide the other few along. Yes the instructor needs to have that level of understanding, you know how the student follow the course." – P33
	More interaction	"Interaction is very important Actually, on Zoom you can split the class into different groups and then have their group discussion on certain subjects and then ask them to present what they are thinking of after the breakout session." – P08
		""If there is a pre-recorded session with all the answers on the screen so that I can pause and read, I can learn more. Because sometimes for pre-recorded sessions if I just play the whole video, maybe after half of the time my mind will go somewhere else. It's not like now I'm looking at you. Pre-recorded ones may be distracted." – P12
Technology	Access to a stable internet connection	"I don't have Wi-Fi, I'm using telephone data. I have 20 GB every month, so I reserved 15 GB for today's session. I didn't use my phone much this much and reserved my data for today's session Yes it's acceptable, provided that I still have the data." – P05
	Data privacy	"The concern is because you are recording, so sometimes we are worried that we are exposed to social media, etc." – P03
		"Of course, before we started you mentioned that this will be used for your research and it will only be seen by you. If someone in your faculty wants to know more, I'm sure you are the only one who can key in and show them. Having said that, I think if the person like the presenter tells us that this will be kept confidential, then we will have the trust that you will keep it [confidential]. Of course we have to see what is the purpose of [the session], we cannot just believe anybody who give us zoom and from anywhere, any sources and then he says don't worry don't worry, we keep your data private and confidential. We have to know. We know you, and [in case] anything happens, we can go to your university, we know your name and we can go [to find you]. But if we don't know, somebody from some X Y company, then maybe we have to be more careful. I think I will be more careful." – P24
		"The only thing is as long as our sharing is kept confidential, it's not for public sharing, but of course you can quote." – P35

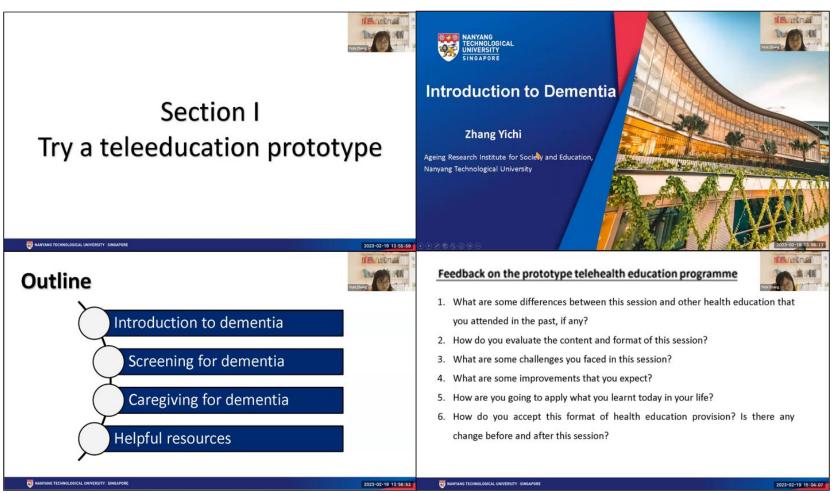
	Health system & policy environment	Standardizing the health education programs	"Can I understand what is your objective of this tele-education program? If it is a national program where it should be rolled out in all over Singapore. Because right now there are many different groups, [and] charitable organizations, everybody is doing their own thing, so if you are telling me that you want to do one as a national program to unite, you know all the different charitable organizations to send in one message instead of so many people doing their own things, then this tele-education can be a very general program where you just want to
			provide a very general kind of exposure, and then from there you give resources where they should go to find out more, maybe [in that way] your reach will be more throughout the whole Singapore, because right now all the different groups when do they, they only can capture a very tiny group of people. So as a national program, you want to get as many people to go through this program, to be educated." – P10
			"So it's everybody echoing the same thing, and you just do that one thing, and that's it. Maybe it's a good approach." – P10
		Continuous health promotion events	"[Community health club and other programs] are good, but such programs should be ongoing. Sometimes they are very hot for a while then after some time just die off. So maybe community centers can help organize more regular programs, not just once a while but more regular, maybe quarterly." – P17
		Publicity of the current health promotion events	"[And more publicity should be done to gain more awareness of these facilities, otherwise it's a waste." – P17
		Subsidies for lifestyle medicine	"When you have a problem you go to a hospital and they will send you to a rehab center where you actually go for coaching, you are not going there to exercise, the point is telling you what kind of exercise you should do because of your condition, then after that they referred me to a gym and then they don't call you as members, they call you patients. And the gym is not the crowded one, it's more focused, and we need to pay for it. Now I have problem with it because government does not recognize it, exercise actually is important, is equally important as taking medication. There are subsidies for medications, but no subsidies on exercise. And I dropped this one, when I joined that one for 20 sessions, I had to pay \$250. Then after 5 or 6 years, it came up to double. I don't receive any subsidy, but it's very important for me." – P21
Opportunities	Health education	Identifying the health	"Because it's very hard to get the audience that is of the same standard, so if you just do a public announcements that come and listen, you will have all kinds of people, some catch it [and] some don't catch it. So that's my view. So

design -	information	if you want that tailoring, you can approach these organizations, mainly the family centers or social centers, so they
content	needs of	have their own group of the same standard of seniors." – P11
	different subgroups of audience	"You said not everyone can understand English, then Mandarin is very very varied depending on where they come from, is there a possibility of being just simple mandarin language? And in your faculty, maybe people who know Cantonese, Hokkiene, don't give them a very deep [difficult document] like what you give us the slides all that, just talk to them, and talk to the ambassadors there, some may be able to speak Cantonese, some may speak Hokkien, some may speak Malay, can just give them the simple thing, not factual knowledge. I don't think they want all this knowledge. Just have some conversation, give them some outline of it, and say if you want anything you can go to this place, if you are not so sure you can go there. I'm very sure people are receptive, they really need help. Just give them some informal ones. So if you ask me what I see just now [in the session], I can only tell you some. So just general normal layman conversation! They will understand if it's in their language." – P24
Health education design - platform	Taking advantage of different education	"If this is something that can be available online where you can access any time, and you can use that to share with your friends or whoever you need to share. So you can have a platform to share rather than you have to attend the session in order to learn [the Zoom link can be shared with others, not like the physical sessions which need registration to attend]." – P04
	platforms	"One important thing is to get them to put on their names when they join Zoom rather than just use "Samsung phone". Many people just say this is a Samsung phone and you don't know them. What I did was even for those who don't want to turn on the video, I will ask them, call their names and ask the questionsActually, on Zoom you can split the class into different groups and then have their group discussion on certain subjects and then ask them to present what they are thinking of after the breakout session." – P08
		"Actually, I think you can have nuggets of a few minutes of intensive exercise. [For] online [ones,] you just give a link or just where they can access online and they can do it by themselves. They just follow the video and then do it. Sometimes I think it doesn't even have to be a group session, it could be an individual session that they can do at their own time when they are free. Because sometimes if it's a group session, I think you have to meet the timing, and you have to cancel some other activities. So that one is also a problem. So I think with nuggets of information online where they can easily access, they can do it on their own. It will also be good. So now and then you have a group session, give them some motivation, give them some tips, and then in other times they can pick it up in their own time." – P10

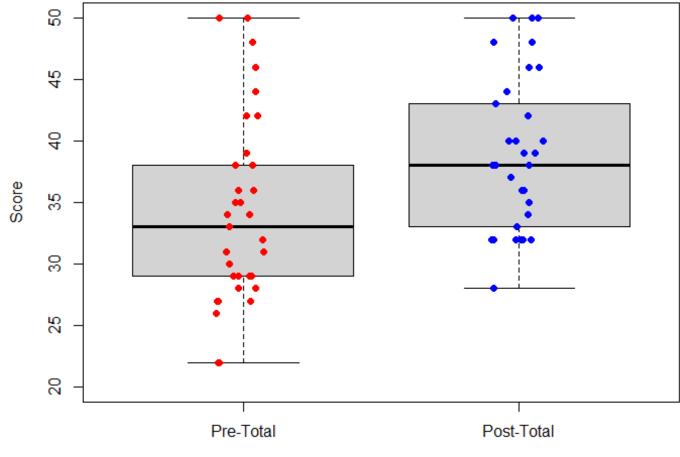
		"And as for the recording, that's the good thing about technology, you can put up the pre-recorded sessions on YouTube, etc. If people cannot register, then they can watch it online and replay the video. If they wish to have more interactions, then they can join the live Zoom or live physical classes. So it gives a lot of flexibility to people to learn." – P18
Health education design – learning theories	Research on the application of learning theories in health education for the older population	"You are actually dealing with adult learning." – P21 "I think this is as much as you can do, but maybe if you have a longer timeframe, instead of showing the information, you can ask them in questions and let the participants find out the information from the resources that you have given them, then they are more involved. I went to the museum and they gave me some questions to find out in the exhibits, I think that was really helpful. It makes it more exciting also for the participants. [P21] At the end of the session [they can] come up with something." – P22
Human – older learners	Personalized health information	"For example, I know my exercise, I go there and will do treadmill, there are a few equipment that I will go as a routine, or I call it a program. And how this program actually developed is not from me because I attended a therapeutic gym before, and based on my condition they came up with this program for me, and surprisingly, every patient has their own program depends on their condition. So it may not be the same one, because some exercise may not be good for you but maybe very good for me, so if I try to be smart and say hey this is very good because it's very good one me, but I'm not a professional. Exercise, is actually better to be personalized, because for example for my case, I was told by my therapist that "uncle you don't bend too far down forward because of your spine condition, but you can bend backwards, and your knees can do only this exercise, you cannot do that exercise because it will hurt your knee." Then I said "wow hurt my knee then I don't need to exercise", [then he said] "oh don't worry, actually there is another exercise which is helpful for your spine but without hurting your knee." These are the things that will be lacking here, [which are] what I'm going to do next and do it correct. My therapist said "uncle, you can do 100 times, but no use one, you make your situation worse because what you do is the wrong thingI go to the SG Active gyms, but there are no therapists, only people in charge, they don't care what you are doing." – P21
		"With the internet I think we have a lot of information coming in. I mean whenever I need any information, I just google. But i think the difference now is to distinguish between what is the right kind of information, whether they are reliable or not. [P21: you are right, you are right. I'm just about coming to that. Nowadays there is a lot of

		misinformation. It can be a topic itself you know?] And some information is not wrong, but does not apply to me as well, because I need to know myself in order to assess if the information is suitable for me, even though it's right in general. That is also another level. So it's actually not the case of not enough information, it's a case of too much information." – P22
Technology	Technologies to facilitate older adults' self-learning	"I think maybe you can come up with something like AI-type interaction like ChatGPT where people can talk about all their problems then the other side maybe is the doctor or maybe some AI thing. Because some people are afraid of sharing, so something like AI may be helpful.[moderator: the information shared by AI may not be true or may not be suitable in the Singapore context]. Yeah that's right. It should be a restricted one, maybe not the general one open to everybody, maybe only a certain area, it's specific to maybe dementia health education. [Do you mean that we design another mini version of ChatGPT or kind of chatbot] Yeah that will be good." – P29
	Older adults' ownership of digital devices	"The only concern is that people need to have a device to access tele-education, but I don't know what's the proportion of people who don't have a mobile phone or laptop.] [P21: and also whether they know how to use, and whether they are willing to learn how to use is another issue. It's a reach out, and need to see the percentage, and think about how to reach out to these people. But you can make use of the social service center, the family centers where they can help you group these seniors to get a venue or the facilities there. They can also help you filter out the audience, so they can help you group and you know how to conduct tele-education." – P22
Health system & policy	More digital learning opportunities	"We all have to learn actually, and gradually we have to go to that direction, using online platforms, see now it's a digital world. So although you say Kahoot, maybe some are not familiar, but people have to learn, have to make effort to learn." – P03
environment		"I can tell you those who are over 70s did not have a chance to go for English education, some of them do not have smartphones, or even if they have smartphones they are very scared to use a smartphone because they are afraid they'll get scam. Because now everybody is telling them be careful, be careful, don't click here click there, because scammers [are] around, so the seniors are very scared to use online gadgets." – P10
		"We live in Singapore, so we have to learn, right now it's zoom, I also struggle with Zoom during the Covid because I went to sign up a course and it was all on zoom, and it was like 3 times a day. So now I also learn more about zoom, where to find the buttons, etc. This is how we get along in life. You have to move with the flow." – P35
	Regular health promotion events during special occasions	"It would be good during this period [to have the health education], because most of the working people will be so drawn in their working life, the awareness of their parents and relatives developing such signals will not come to an awareness until things happen, then it may be too late. So if the government could systematically educate people through all these different diseases, this kind of activities will help to remind people every year like the Valentine's day. Every year you have a promotion that talks on this topic will help to bring about awareness and bring people to learn more about these signals." – P17

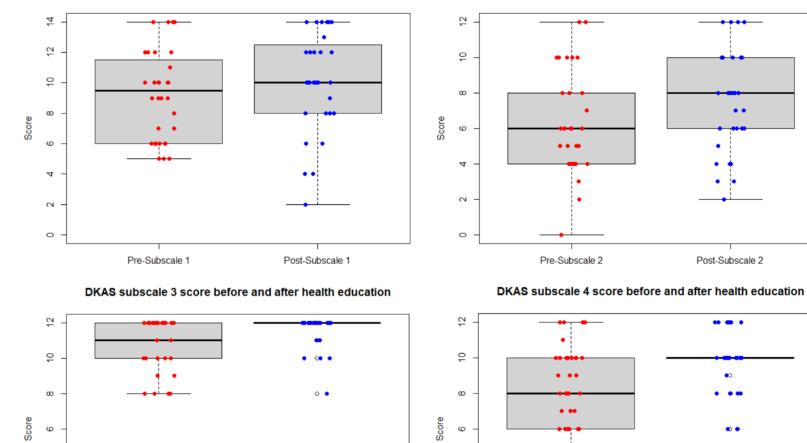
Motivating	"I think for more senior people, we need them to be more digitally inclined. [P21: Those are the pioneer generation.
the inactive	Normally those people are very active, you should look for those who are not so active and see how to get these
older	people out of their comfort zone. It is the most difficult. For people like us, we are very active, we already know
population	what to do to take care of ourselves. You can start with working with some platforms]" – P21 & 22



Supplementary Figure 1. Screenshots of the tele-education prototype







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Pre-Subscale 4

DKAS subscale 1 score before and after health education

DKAS subscale 2 score before and after health education

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Post-Subscale 4

Post-Subscale 3

6 Supplementary Figure 3. Boxplots of the DKAS subscale scores before and after health education

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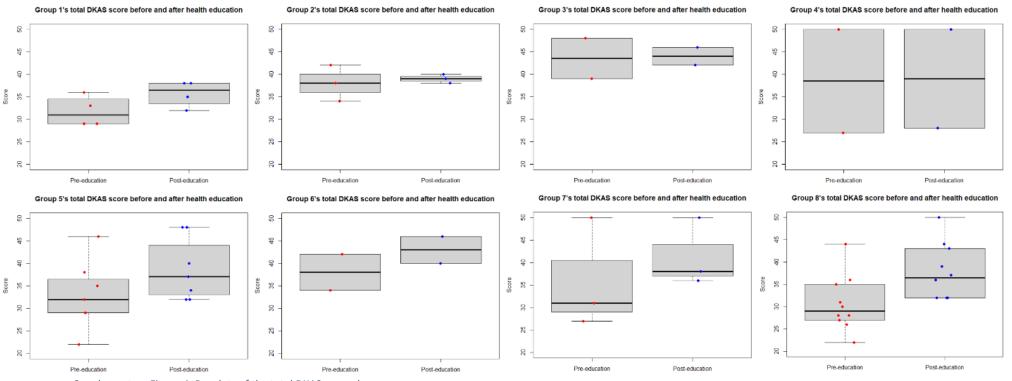
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Pre-Subscale 3



Supplementary Figure 4. Boxplots of the total DKAS scores by group