

BMJ Open Needs and views on healthy lifestyles for the prevention of dementia and the potential role for mobile health (mHealth) interventions in China: a qualitative study

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ABSTRACT

Objectives Over the coming decades, China is expected to face the largest worldwide increase in dementia incidence. Mobile health (mHealth) may improve the accessibility of dementia prevention strategies, targeting lifestyle-related risk factors. Our aim is to explore the needs and views of Chinese older adults regarding healthy lifestyles to prevent cardiovascular disease (CVD) and dementia through mHealth, supporting the Prevention of Dementia using Mobile Phone Applications (PRODEMOS) study.

Design Qualitative semi-structured interview study, using thematic analysis.

Setting Primary and secondary care in Beijing and Tai'an, China.

Participants Older adults aged 55 and over without dementia with an increased dementia risk, possessing a smartphone. Participants were recruited through seven hospitals participating in the PRODEMOS study, purposively sampled on age, sex, living area and history of CVD and diabetes.

Results We performed 26 interviews with participants aged 55–86 years. Three main themes were identified: valuing a healthy lifestyle, sociocultural expectations and need for guidance. First, following a healthy lifestyle was generally deemed important. In addition to generic healthy behaviours, participants regarded certain specific Chinese lifestyle practices as important to prevent disease. Second, the sociocultural context played a crucial role, as an important motive to avoid disease was to limit the care burden put on family members. However, time-consuming family obligations and other social values could also impede healthy behaviours such as regular physical activity. Finally, there seemed to be a need for reliable and personalised lifestyle advice and for guidance from a health professional.

Conclusions The Chinese older adults included in this study highly value a healthy lifestyle. They express a need for personalised lifestyle support in order to adopt

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This qualitative study builds on previous interview and focus group studies evaluating use of digital self-management applications and remote lifestyle coaching.
- ⇒ Through purposive sampling on medical history, living situation and educational level, we were able to provide an extensive overview of the potential attitudes, needs and preferences of Chinese older adults on healthy lifestyles to prevent dementia.
- ⇒ The scope of our study may be limited to urban Chinese older adults, as participants were largely recruited in the Beijing and Tai'an urban areas.

healthy behaviours. Potentially, the PRODEMOS mHealth intervention can meet these needs through blended lifestyle support to improve risk factors for dementia and CVD.

Trial registration number ISRCTN15986016; Pre-results.

INTRODUCTION

China has the largest population of people with dementia worldwide. The rapidly increasing incidence of dementia is expected to seriously challenge the Chinese public and healthcare system in the coming decades.^{1–3} Observational studies have shown an association of lifestyle-related risk factors with dementia in people aged 65 and over.⁴ An estimated 40% of dementia cases might be attributable to these risk factors,⁵ suggesting the potential to delay or even prevent dementia if these risk factors are successfully addressed.

For successful implementation in China, including its underserved rural areas, such

dementia prevention interventions should be inexpensive and easily accessible. Digital health interventions may meet these criteria, given the wide and increasing availability of internet.^{6,7} As in China, the internet is most frequently accessed through smartphones,⁸ digital health interventions offered as mobile health (mHealth) may be most feasible. The Prevention of Dementia using Mobile Phone Applications (PRODEMOS) study will assess the effectiveness and implementation of a coach-supported mHealth intervention to reduce overall dementia risk in older people in the United Kingdom (UK) and Beijing, China.⁹ The development of this application builds on the internet platform used in the Healthy Ageing Through Internet Counselling in the Elderly (HATICE) trial, which recently demonstrated that a coach-supported internet intervention leads to a modest improvement of cardiovascular risk profile of older adults in three European countries.¹⁰ For PRODEMOS, the mHealth intervention will be adjusted according to the needs and wishes from the target population.

Despite a growing interest in risk factor management through mHealth, little is known about needs and views of Chinese older adults regarding lifestyle behaviour change and the potential role of mHealth. With the steep increase in unhealthy lifestyles, dementia and cardiovascular disease (CVD)-related mortality in China, this has become an urgent, national priority.^{11,12} In the current study, we aim to explore the knowledge, experiences, attitudes, needs and views of Chinese older adults regarding healthy lifestyles for the prevention of dementia and CVD through mHealth. The results of this study will facilitate development and cultural adaptation of the PRODEMOS intervention.

METHODS

PRODEMOS trial

The current qualitative study is part of the PRODEMOS randomised controlled trial (RCT). The PRODEMOS RCT aims to include 1200 older adults both in the UK and in China, with an increased dementia risk. Participants are randomised between a coach-supported mHealth intervention and care-as-usual. Main functionalities of the intervention app are similar to the HATICE platform (ie, setting lifestyle goals, entering measurements, receiving coach support through the chat functionality and receiving interactive education). Dementia risk and implementation outcomes are assessed after 18 months.⁹

Participants

For this qualitative study, participants were recruited through a phone call or WeChat (a common Chinese social media platform) by doctors or village leaders within the catchment areas of seven Chinese hospitals participating in the PRODEMOS study. Centres varied regarding type of care offered (general vs specialist) and location (Beijing, urban Tai'an and rural Tai'an area). Eligibility criteria were largely similar to the PRODEMOS

study protocol: aged 55+, possession of a smartphone, non-demented and with increased risk of dementia. Increased dementia risk was defined as ≥ 2 dementia risk factors, that is, history of CVD or diabetes, hypertension, obesity, dyslipidaemia, depression, insufficient physical activity and active smoking.⁸ Participants were recruited based on their medical records, or when they visited the hospital for their regular medication prescription and were purposively sampled on age, sex, living area, history of CVD and diabetes and educational level. Of 26 out of 35 invited individuals were willing to participate in the study. Written informed consent was obtained before the start of each interview. The ethic committee of the Capital Medical University (CMU), Beijing approved the study.

Data collection

Between February and December 2019, we performed semistructured interviews in sets of 3–6 interviews. An interview guide (online supplemental file 1) was composed by researchers from CMU, Edith Cowan University and Amsterdam UMC. It included questions about knowledge, experience, attitudes, needs and views regarding healthy behaviours in general, their potential role in the prevention of dementia and CVD and the perceived window of opportunity for mHealth and coach support. Every interview was preceded by a short introduction on the PRODEMOS study. If deemed necessary, we made adjustments to the interview guide after each set of interviews (eg, adding questions about Traditional Chinese Medicine (TCM) and the preferred background of the coach). Nine researchers (JZ, XL, BJ, HL, WZ, JL, YN, YY and XX) performed the interviews. XL is a professor in general medicine and has broad experience with qualitative research. BJ, HL, WZ, JL, YN, YY and XX are medical doctors and received training in qualitative research from EPMvC. To minimise between-interviewer variation, interviewers were asked to adhere to the interview guide as much as possible. The principal researcher (JZ, PhD student) attended all interviews to make field notes and to ensure that all topics of the interview guide were sufficiently discussed. EE attended six and EPMvC attended four interviews in person, with live translations into English by a professional translator. The interviews took place in the participating centres, local community venues or at the participant's house. The interviews lasted 35–90 min were audio-recorded, and transcribed verbatim. Data collection was finished once data saturation had been reached.

Coding and analysis

Thematic analysis was performed by five researchers (JZ, XZ, MS, EPMvC and EE) following the six phases as described by Braun and Clarke.¹³

1. Transcripts were translated into English and shared with the Amsterdam UMC researchers. After each set of interviews, transcripts were thoroughly read by the researchers in their own language. JZ, MS and EE discussed all transcripts. A licensed translator attended

- to make sure that all transcripts were fully understood and appropriately translated.
- Initial coding was performed by two researchers from CMU (JZ and XZ) independently using the MaxQDA software for qualitative research. After coding each set of interviews, codes were compared and discussed until disagreements were resolved, resulting in a new set of codes. EPMvC and EE reviewed the coding of each interview during video meetings with JZ, MS, XZ and the licensed translator. A Dutch medical doctor with extensive knowledge of the Chinese culture and language (RT) was involved in interpretation of the findings.
 - After initial coding of all interviews, researchers from CMU and Amsterdam UMC independently searched for potential themes. Potential themes and their inter-relationship were discussed during several online video meetings and a face-to-face meeting in Beijing.
 - Potential themes were reviewed and organised into thematic maps. The licensed translator attended the online discussions to verify consistency with the original meaning of the texts. All transcripts were re-read by JZ and EE to ensure that the themes were a good representation of the data.
 - Narratives were written for each theme by JZ and EE independently. The narratives were discussed with EPMvC and MS. The names and arrangement of themes and subthemes were refined accordingly.
 - Illustrative examples were selected by JZ and EE, and were translated into English by the licensed translator.

RESULTS

We performed 26 semistructured interviews. Participants were aged 55–86. Demographics and medical history of the participants are presented in [table 1](#).

We identified three key themes: ‘valuing a healthy lifestyle’, ‘sociocultural expectations’ and ‘need for guidance’. The themes and subthemes are listed in [table 2](#).

Valuing a healthy lifestyle

Why it is important to live a healthy lifestyle

Many participants stressed that a healthy lifestyle is important, emphasising the relationship between a healthy lifestyle and CVD. Some interviewees felt that living healthily could reduce the risk of future dementia. Physical activity, a healthy diet and refraining from smoking or drinking alcohol were considered healthy behaviours.

I think the reason why my elder brothers passed away so early is that they smoked and did not exercise. [...] Only now I realise that it’s not healthy to stay up late and do no exercise. Maybe they didn’t realise it at that time (Participant no. 9).

Table 1 Sociodemographic characteristics and medical history of included participants

Characteristic		N=26
Age (year)	Median (range)	64(55–86)
Sex (female)	N (%)	13 (50)
Retired (yes)	N (%)	17 (65)
History of CVD (yes)	N (%)	9 (35)
History of diabetes (yes)	N (%)	13 (50)
Education level*		
<i>Primary school and below</i>		1 (4)
<i>Junior high school</i>	N (%)	8 (31)
<i>Senior high school</i>		9 (35)
<i>College and above</i>		8 (31)
Living situation		
<i>With spouse only</i>	N (%)	9 (35)
<i>With spouse+other family</i>		15 (58)
<i>Alone</i>		2 (8)
Number of risk factors†		
<i>1 or 2</i>	N (%)	8 (31)
<i>3</i>		12 (46)
<i>4 or more</i>		6 (23)
Region		
<i>Beijing</i>	N (%)	21 (81)
<i>Urban Tai’an‡</i>		2 (8)
<i>Rural Tai’an</i>		3 (12)

*Primary school, ISCED level of 1; junior high school, ISCED level of 2; senior high school, ISCED level of 3; college and above, ISCED level of >4.
 †Risk factors include diabetes mellitus, insufficient physical activity according to WHO criteria, active smoking, hypertension, dyslipidaemia, obesity and depression.
 ‡City in Shandong province with 5.5 million inhabitants.
 CVD, cardiovascular disease; ISCED, International Standard Classification of Education.

Some participants mentioned more specific, Chinese healthy behaviours, including taking footbaths, spinning walnuts and having a balanced temperament.

It is said that spinning walnuts can activate blood vessels. I reckon it’s good for preventing cerebrovascular diseases (Participant no. 16).

Table 2 Key themes and subthemes

1. Valuing a healthy lifestyle
Why it is important to live a healthy lifestyle
Experiences on improving lifestyle behaviour change
The role of Traditional Chinese Medicine
2. Sociocultural expectations
3. Need for guidance
Finding reliable, useful information
Need for a tailored health plan and personalised support

Some participants mentioned that, at older age, a healthy lifestyle becomes less important, because disease may already have developed.

I often drink alcohol, eat meat and sometimes pickled vegetables. I think these are not so good, but I feel I found out too late. The underlying diseases already developed (Participant no. 4).

Other participants mentioned that health is largely determined by destiny or genetic predisposition rather than by lifestyle behaviours.

I don't know [about risk factors for dementia]. But sometimes it is your fate to get sick, this has to do with genes (Participant no. 16).

Experiences on improving lifestyle behaviour

All participants had experience with lifestyle behaviour change, often triggered when a participant experienced illness. Confrontation with diseases, such as CVD or diabetes, could be a motivator to quit smoking or make changes to their diet. Also, the disease or death of a close friend or relative could be a trigger to change behaviour.

I quit smoking after I got sick. [...] I quit smoking straight after I had a myocardial infarction (Participant no. 10).

A friend from the past has cancer, which is a huge alert for us [to smoke or drink less alcohol] (Participant no. 11).

Some participants started to change their behaviour after they found out about abnormal values during regular health check-ups, for example, for blood pressure and cholesterol.

There was a time when my blood pressure was really high [...]. Then I quit smoking and started drinking less alcohol (Participant no. 15).

The role of TCM

Some participants used TCM to stay healthy, such as acupuncture and Tai Chi. Such activities could go hand-in-hand with other lifestyle changes, such as changes in diet. Moreover, some participants mentioned that they used medicinal TCM to stay healthy, although most participants mentioned use of medicinal TCM to treat rather than prevent disease. Some participants did not use medicinal TCM because, in their experience, the effect of TCM comes too slow.

I practiced Tai Chi, and now we also practice Yi Jin Gong and Ba Duan Jin every morning. Since my father is in his eighties, it's more suitable for him to do this kind of low-intensity exercise. I do the same exercise together with him (Participant no. 25).

I don't use traditional Chinese medicine very often because it works too slowly. When my blood pressure is high, the effect will be too slow after taking it. The

problem of high blood pressure cannot be solved by traditional Chinese medicine (Participant no. 24).

Sociocultural expectations

Participants mentioned that support from their family and friends can be helpful to start or maintain healthy behaviours. For some, the social environment was the drive to change behaviour, as they tried to quit smoking or drinking because others urged them to do so.

There is no need to be told by others because I know how to do this [a healthy lifestyle], but I don't want to do it. However, I'm especially willing to do it when my children say it once in a while (Participant no. 10).

Similarly, family members could take the lead in lifestyle support, for example, by cooking and eating healthier food for the sake of the spouse's health.

Previously, I cooked whatever he liked to eat, [...] but since he suffered from myocardial infarction, I cook with the principle of less meat, less fat and less salt (Participant no. 20).

Participants mentioned that engaging in change together can facilitate behaviour change. Some participants went walking or square dancing together with friends, family members or people living in the same neighbourhood and reminded each other of the intended behaviour. Drinking or smoking behaviour could also be influenced by the social environment, although sometimes in a more unconscious way.

[...] we live in the company dormitory in which there are more than 200 households. We often make an appointment to walk together. It really works (Participant no. 19).

I think it has a lot to do with the crowd. It helps if you're dealing with people who are willing to change. If there are four people, of whom three of us don't smoke and only I smoke, then I will smoke less, but if everyone does, I will smoke more. [...] Others certainly influence me (Participant no. 11).

Also, the *digital* social network could be of support. Almost all participants had experiences with use of one or more lifestyle-related miniprogrammes (comparable to apps) offered by WeChat. Examples of such programmes are platforms for health-related knowledge exchange and lifestyle groups where peers can support each other to live healthily. For some participants, comparing their own results (ie, number of steps), with the results of others, could serve as an impetus to further increase their efforts.

I think one of the best things about my participation in this weight loss program is that there is a WeChat Group. Especially when I just joined, it was also a stimulant for me to see others exercise in the group (Participant no. 25).

My son enables WeChat Sports for me. [...] When it is time, I will go out for a walk. After the walk, I will

compare my steps with others. It is like a task, it motivates me (Participant no. 6).

Many interviewees had important family responsibilities, such as taking care of their grandchildren or their ill or disabled spouse and/or parents. The need to take care of others was often a motive to stay healthy, as participants feared to burden others with these care tasks or become a burden to others if they themselves would develop disease. Apart from being a motive, time-consuming family responsibilities were sometimes a barrier for healthy behaviours, such as physical activity.

If we are in good health, the burden on our children will be less. Otherwise, [...] our children's burden will increase (Participant no. 6).

It feels like I'm spending too much time taking care of my family, and then neglect my own health. I feel the family burden is too heavy. (Participant no. 4).

Some participants experienced conflicts between the choice for improved lifestyle behaviours and meeting social expectations, as participants seemed to associate smoking and drinking alcohol with hospitality. Participants mentioned difficulties to forbid guests to smoke in the house, leading to secondary smoking, especially when guests were not part of the inner social circle. Moreover, some participants were inclined to accept cigarettes or drinks, as a courtesy, when offered by others.

It annoys us if guests smoke in our house, my husband says not to let them come in our house in the future. But once the guests have arrived, how can we say that they cannot come? (Participant no. 5).

[...] if my son-in-law comes over, I won't tell him not to smoke here. I can persuade my son and daughter, but not my son-in-law (Participant no. 9).

Need for guidance

Finding reliable, useful information

Most participants were willing to improve their lifestyle behaviour but did not know how to achieve this all by themselves. Most interviewees obtained their health information from TV or WeChat, yet often questioned its general reliability and applicability to their personal (health) situation.

I just think there's too much information on Baidu [Chinese search engine, comparable to Google], sometimes it's not all correct and sometimes it doesn't fit my disease condition (Participant no. 20).

Participants expressed a need for comprehensive information about the CVD risk factors or diseases they suffered from and personalised advice on how to improve these conditions.

I need guidance from others. It should be based on my actual situation, instead of just telling me how to do, which may be harmful to me. I hope it will be a

personalised guidance focusing on me (Participant no. 3).

Need for a tailored health plan and personalised support

Participants called for a health plan suited to their needs and abilities. Such a plan would need to be quite clear cut, for example, about what, when and how much one should eat in their specific situation.

[I need information] for example, how to do exercise; when and how long do I need to sleep? In terms of meals, it should be specific: what to eat, what I can eat and the most important is how much to eat, requiring a refined recipe (Participant no. 24).

On the other hand, some participants mentioned that guidance should not be too strict because making too major changes at once would be unrealistic.

Other people can give me advice. I'll follow it if I think it works, but it should not be too strict. For example, if you tell me I can't eat meat for a week, I can't do that (Participant no. 22).

Ideally, lifestyle advice should be given by a health professional best qualified for this task. Some participants felt that this was best done by doctors, given their expertise on the complex interplay of disease, medication and lifestyle behaviours. However, many interviewees realised that doctors often lack the time to provide intensive lifestyle support. Some felt that nurses could take on the role of competent lifestyle coaches, provided that they would be supervised by doctors.

I think nurses may be less professional, but provide better service. Nurses may be more patient in communicating with others, but less knowledgeable than doctors (Participant no. 23).

If nurses are unable to answer questions, I believe [...] doctors can provide guidance. Moreover, you don't have to answer me in real time, just give me guidance after your discussion (Participant no. 19).

DISCUSSION

Summary of main findings

In this study on perspectives regarding healthy lifestyles to reduce dementia and cardiovascular risk among Chinese older adults, we identified three main themes. First, following a healthy lifestyle was generally regarded important. In addition to generic healthy behaviours, participants considered certain specific Chinese behaviours healthy, including tai chi, and acupuncture. Second, sociocultural context played an important role in lifestyle behaviour change. The main motive to stay healthy was to limit the burden put on family members, because, by Chinese tradition, children often take care of their elderly parents and (retired) parents take care of grandchildren. However, family responsibilities may also impede healthy behaviour such as regular physical



activity. Moreover, other Chinese social values, such as being hospitable to guests by allowing them to adhere to smoking and drinking habits, sometimes conflicted with own intended health behaviours. Third, participants often regarded information on TV and WeChat as too generic or incorrect. There seemed to be a need for reliable and personalised lifestyle advice and guidance from a health professional.

Comparison with the existing literature

The interviewees appeared well aware of the relationship between lifestyle and chronic disease risk. This finding is in contrast with a survey performed in 2013 among 925 elderly living in Jinan, China, suggesting that participants had limited knowledge on and awareness of the relationship between lifestyle behaviour and chronic disease risk.¹⁴ Moreover, comparable studies on health literacy in general showed lower rates among people of higher age groups.^{15 16} Since we specifically aimed for participants with known vascular risk factors, this may have led to selection of people with increased awareness for (secondary) disease prevention, as was also found in a cross-sectional study comparing 46 000 Chinese people with and without CVD.¹⁷ Another explanation may be that, in recent years, prevention of dementia and CVD has become central to the agenda of Chinese policymakers. The 2008 healthcare reform has strongly focused on improving preventive healthcare and health education,^{18 19} for example, through large-scale health promotion through TV programmes and several public health strategies to discourage cigarette smoking and reduce salt intake in larger cities such as Beijing.^{7 20} This increased public attention may have contributed to interviewees' awareness of healthy lifestyles in the prevention of diseases.

Our interviewees indicated that being accommodating to guests sometimes conflicted with their own healthy behaviours. This finding is in accordance with results from a focus group study in Beijing, where adults (30+) believed that smoking and drinking alcohol were necessary to earn respect from their guests.²¹ In the Chinese culture, drinking alcohol—traditionally as an important part of special celebrations and festivals—and sharing tobaccos are common ways to show respect, especially in rural areas.^{22 23} China's most recent national health policy²⁴ focuses especially on promotion and popularisation of healthy lifestyles. Perhaps, with continuous public attention, and alcohol and tobacco control strategies that take cultural aspects into account, healthy behaviours will more and more become part of Chinese sociocultural habits, starting in younger and urban communities.²⁴

Our participants expressed a need for professional guidance, which is in accordance with a previous qualitative study among Chinese rural adults. They were highly motivated to change their behaviour but were unable to succeed without professional support.²¹ In China, many health-related information is available on Chinese internet. However, the needs of end users are not always

met, as they find it difficult to judge the validity of health information on the internet.²⁵ Moreover, existing apps often lack personalised and professional guidance.^{26 27} China has approximately two doctors per 1000 inhabitants, compared with 3.6 in the European Union.^{21 28} Although our interviewees often considered doctors most qualified for lifestyle support based on their expertise, some realise that doctors may lack the time to meet their needs. For many participants, lifestyle support given by a nurse or other healthcare professional would, therefore be acceptable, especially when supervised by a doctor.

Strengths and limitations

A strength of our study is our purposive sample with participants who differ regarding their CVD history, living situation and education level. This approach gave us an extensive overview of the potential attitudes, needs and wishes of Chinese older adults living in the Greater Beijing area. We were able to build on previous qualitative research experiences on evaluating lifestyle coaching and use of digital self-management applications in Europe.^{29–32} In order to overcome cultural and language barriers, a licensed interpreter was involved in the translations of all interview transcripts and multiple in-depth discussions of our (preliminary) findings with the Chinese partners and other experts in Chinese culture and language. Furthermore, the interview guide was aimed at discussing examples from daily experiences to limit the chance of socially desirable answers. We followed the consolidated criteria for reporting qualitative research guidelines to improve the interpretation and reproducibility of our results.³³

A limitation of our study is that most of our interviewees lived in the urban Beijing area. This limits our scope to urban older adults, where there are considerable differences between urban and rural areas in China regarding healthcare and awareness for disease prevention.^{19 34 35} Another potential limitation is that some interviewees and interviewees had a doctor–patient relationship. This may occasionally have led to selective questions or socially desirable answers. We have deliberately decided on this approach, because, in Chinese culture, private issues, including lifestyle behaviours, are most easily discussed with people who are well trusted. An independent researcher was present at all interviews to standardise the interviews.

Implications for practice and research

Despite high awareness for disease prevention and motivation to adopt a healthy lifestyle, Chinese older adults expressed a strong need for tailored lifestyle support from a health professional. With approximately 67% of inhabitants owning a smartphone in 2020, China is in the top 10 countries with highest smartphone coverage.³⁶ There are many Chinese smartphone applications and mini-programmes to help individuals adopt a healthier lifestyle. However, only very few have been scientifically studied or validated.³⁷ Fuelled by the findings of our study, we have tried to adjust the

PRODEMOS intervention to the needs and wishes of the Chinese target population. The PRODEMOS app will be embedded as a mini-programme in the WeChat environment. Results from other apps or mini-programmes, such as step counters, will be automatically transferred to the PRODEMOS mini-programme. If desired, participants can choose traditional Chinese options to work on their healthy lifestyle, including tai chi and square dancing, although our intervention, which focuses on lifestyle rather than medication use, does not include advice on medicinal TCM. To facilitate peer support, the platform will enable participation of a spouse and other cohabitating relatives in the same study arm, and offers 'peer videos', showing experiences of other older adults who changed their lifestyle behaviours. Based on the needs and wishes for coaching, PRODEMOS participants will receive trustworthy health information and personalised coaching, tailored to the participant's health condition and social environment. To optimally fit into Chinese current practice, coaching in PRODEMOS will be performed by nurses, with supervision from a doctor. Coaches will be specifically trained to provide lifestyle advice that matches well with daily routines of participants, involving relevant peers. Specific attention will be paid to sociocultural values, such as time constraints due to family responsibilities, which may complicate (sustained) behaviour change.

The mHealth intervention will be tested in an RCT in the greater Beijing area in the coming years. Facilitating a personalised approach, it has the potential to support Chinese older adults to improve their lifestyle-related risk factors for CVD and dementia.

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Topic list

1. Introduction

My name is [name] and I work for [institution]. We are doing research on a healthy lifestyle. We are currently developing a smartphone application that should help people aged 55 years or older to live healthier, in order to decrease their risk to live healthier. There will also be a coach involved to help people with this. We want to understand what the wishes are of people aged 55 or older. I have conversations with some of those people and you are one of them. Thank you very much for participating in this interview!

We would like to talk with you about your lifestyle, for instance about your physical exercise, your diet and other habits. Our research subject is dementia. Dementia is an old age disease. For that reason we're looking for older people to talk with. We would like to talk with you about this disease. The interview will be about your experiences, so please tell us whatever you can think of. Everything you will tell us important and interesting for us. The interview will take about 45 minutes and will be audio taped. Before we start, I'd like to let you know that we will not share the information with other people outside our research team. The audio tapes will anonymously be stored in our office.

2. Demographics

- a) Date of birth
- b) Place of birth
- c) Place of residence
- d) Living situation: living on your own / living with a partner / living with (grand)children / living with others
- e) Level of education
- f) (Former) profession

3. Introduction of participant

Before we get started, I want to get to know you a little better. Would that be ok? Happy to tell you about me as well if you like. This is to discuss what your daily life looks like.

- a) Could you please tell me something about your daily life?
- What do you do on a regular day? Do you still work? What kind of work do you do? Do you have hobbies? Do you regularly see friends or family?
 - Are you happy with your daily life, or are there things you'd like to change? Many people experience stress, for example due to their work. Do you experience any occupational stress? Or are there any other stress factors that have considerable influence on your daily life?

4. View on self-management of a healthy lifestyle

As I told you, we are doing research on a healthy lifestyle. I'd like to talk with you about your habits that are related to your health, such as smoking and physical activity. Is that ok?

- a) Can you tell me something about your lifestyle behaviour?
- Are you physically active? What kind of activities do you do?
 - What does your diet look like? Describe me what kind of food you eat during the day. Do you cook yourself, or does somebody else cook for you?
 - Do you smoke tobacco? What kind of tobacco do you smoke? How much do you smoke? At what age did you start?
 - Do you drink alcohol? What kind of alcohol do you drink? How much do you drink? At what age did you start drinking?
- b) Everybody has certain behaviour or habits that are healthy or unhealthy. Some people try to change certain behaviour into more healthy behaviour. Have you ever tried to change certain aspects of your behaviour? *[to researcher: please ask that apply, according to their habits mentioned previously]*
- Have you ever tried to become more physically active (for example in order to lose weight)?
 - Why did you try that? Was there a trigger?
 - How did you do that?
 - Did you manage to increase your physical activity? What aspects made it hard to increase your physical activity? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]*
What aspects helped you to increase your physical activity? *[for researcher:*

think of support from others, support from healthcare workers, seeing results etc.]

- b. Have you ever tried to change your diet into a more healthy diet (for example to lose weight)?
 - i. Why did you try that? Was there a trigger?
 - ii. What did you change / How did you do that?
 - iii. Did you manage to change your diet? What aspects made it hard to change your diet? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]* What aspects helped you to change your diet? *[for researcher: think of support from others, support from healthcare workers, seeing results etc.]*
- c. Did you ever try to stop smoking tobacco?
 - i. Why did you try that? Was there a trigger?
 - ii. How did you do that?
 - iii. Did you manage to quit smoking? What aspects made it hard to quit smoking? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]* What aspects helped you to quit smoking? *[for researcher: think of support from others, support from healthcare workers, seeing results etc.]*
- d. Did you ever try to stop drinking alcohol?
 - i. Why did you try that? Was there a trigger?
 - ii. How did you do that?
 - iii. Did you manage to quit / decrease drinking? What aspects made it hard? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]* What aspects helped you to quit/decrease drinking? *[for researcher: think of support from others, support from healthcare workers, seeing results etc.]*
- e. Have you ever tried other aspects of your behaviour?
 - i. What did you change?
 - ii. Why did you try that? Was there a trigger?
 - iii. How did you do that? Was it successful? What aspects made it hard? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]* What aspects helped you? *[for researcher: think of support from others, support from healthcare workers, seeing results etc.]*

- c) Did you ask for support of others, when you tried to change your behaviour? *[please relate to one or more attempts to change behaviour mentioned by the participant]*
- a. *[if no]* Why didn't you ask for support? Were you hesitant / embarrassed to ask somebody? Or was there nobody available? Have you considered to ask anybody for support?
 - b. *[if yes]* Who did you ask for support? Why did you ask this specific person? Could he/she help you to continue your behaviour change? How did he/she do this?

5. Risk of cardio- and/or cerebrovascular disease and dementia.

As I told you in the beginning, we are currently developing a smartphone application that should help people to live more healthy, in order to decrease their risk to develop dementia and other disease, such as cardiovascular disease and cerebrovascular disease. I'd like to talk with you about these diseases.

- a) Do you know people with dementia? Or do you know something about dementia?
 - a. What do you know about this disease?
 - b. How do you see your own risk to develop dementia? Do you fear that?
 - c. Do you have the feeling that there is anything you can do to prevent dementia? Are there things you do to prevent dementia?
- b) Do you know people who suffer from cardio- or cerebrovascular disease, such as a heart attack or stroke?
- c) Do you yourself suffer from such disease?
 - a. *[if no]* Do you know what risk factors you have? How do you see your own risk to suffer from such disease? Do you fear that? Do you have the feeling that there is anything you can do to prevent such disease? Are there things you do to prevent cardio- and cerebrovascular disease?
 - b. *[if yes]* How do you see your own risk to suffer again from such disease? Do you fear that? Do you have the feeling that there is anything you can do to prevent such disease? Are there things in your behaviour you have changed since the cardio- or cerebrovascular disease?
- d) Do you have cardiovascular risk factors?
 - a. Are you overweight? *[if yes]* since when are you overweight?

- b. Do you have high blood pressure? *[If yes]* How long do you know that you have high blood pressure? Do you use antihypertensive medication?
 - i. Tell me about the use of the medication. How often do you use it? Do you use different drugs? Do you have difficulties taking the medication?
- c. Do you have high cholesterol? *[If yes]* How long do you know that you have high cholesterol? Do you use statins?
 - i. Tell me about the use of the statins. How often do you use it? Do you use different drugs? Do you have difficulties taking the medication?
- d. Do you have diabetes? *[If yes]* How long do you know that you have diabetes? Do you know how diabetes is optimally controlled? What do you know about the target levels [of glucose or HbA1c]
 - i. Do you have medication for diabetes? How often do you use it? Do you use different drugs? Do you have difficulties taking the medication?
- e) Can you think of other potential risk factors for cardiovascular disease, such as second hand smoking? *[It can be hard to change lifestyle when the person(s) you live with has certain (unhealthy) behaviour. If somebody is living with a partner, other family members or roommates:]* Can you tell me something about the lifestyle and risk factors of your partner / family member / roommate?

Do they smoke tobacco / do they drink / do they have certain less healthy diet habits?
To what extent does that influence your own healthy behaviour? For example, is your partner / family member / roommate involved in cooking your meals?

6. View on sustained lifestyle changes through mHealth / lifestyle apps + remote coach

Like I said in my introduction, we aim to design an app for the smartphone or tablet that could help you to improve your lifestyle behaviour and to decrease dementia risk.

- a) Do you have a smartphone *[mobile phone with apps, such as Wechat]*?
 - a. What do you use your smartphone for? When do you use it? *[use at home, or also use in public transport / while shopping etc.]*
 - b. Do you need others (family or friends) to help you with the smartphone?
- b) Do you have other devices, such as desktop computer or laptop?

- a. *[If yes]* What things do you prefer to do with your computer / laptop / tablet instead of your smartphone? Why?
- c) Have you ever used your smartphone to improve your lifestyle? *[I.e. apps to count calories; to improve physical activity; quit smoking]*.
 - a. What kind of app / website was that? When did you start using it? How did that go? How did the app help you? What aspects did you like? What did you dislike? Why did you stop using the app? Did you need others (family / friends) to help you with the app?
 - b. What would you worry about health management using this kind of app? What would you request or expect on this app?
- d) How could an app help you?
 - a. Do you think that an app can help you to have a more healthy lifestyle? *[If not]* Why not?
 - b. For what kind of behaviour change would you use the app? *[think of increasing physical activity, diet change, quit smoking/drinking etc.]* Why? Are there any aspects you think you will never be able to change?
 - c. What should such an app be able to do for you?
 - i. Would you use the app to enter your behaviour (for example: physical activity) or the results (for example: your weight)? *[If not]* Why not?
 - ii. Would you like an app that facilitates contact with other people like you? *[If yes]* How would you use that function? *[If not]* Why not?
 - iii. Could the app help you by offering information about a healthy lifestyle, or do you prefer to search the internet yourself?
 - iv. Do you have other suggestions for the app to help you to improve your lifestyle?
- e) The app we are currently developing will be linked to a remote coach.
 - a. What would you think of a lifestyle coach, that is attached to the app? Why would(n't) that be helpful? What do you expect from such coaching?
 - b. What do you consider important in such a coach? *[education, approach etc.]*
 - c. Is it important for you to have met the coach in real life? What is your preferred way to have contact with the coach? *[Wechat / phone calls etc / face to face / video message etc.]*
 - d. How often would you like to have contact with the coach?
 - e. How would you prefer to receive feedback? *[Automatic? SMS? Message from coach?]*

- f. Do you use WeChat ? How long do you use WeChat on average?
- g. Do you follow with interest (pay attention to) the WeChat Public Number or WeChat applet related to health care? Would you prefer us to guide your lifestyle through WeChat or App?

7. End of interview

We have come to the end of our interview. Thanks so much for your help!

- Are there any things that you would want to add? Do you have any questions?

Translation

访谈话题

1. 介绍

我叫什么[姓名]，在[xx 机构]工作。我们正在做预防痴呆症的研究。我们目前正在开发一种智能手机应用程序/软件，可以帮助 55 岁或更大年龄的老人生活得更健康，从而降低他们患痴呆症的风险。使用过程中，会有一名（生活方式指导）教练/专业人员来帮助用户。我们想知道 55 岁或以上年龄的老人对此有什么期望（想法/需求）。我需要和这些人进行交谈来对此有所了解，您就是其中的一位。非常感谢您参加这次访谈！

访谈内容将是关于您的经历，所以您可以告诉我们您能想到的任何想法/相关的事情。您告诉我们的每件事对我们来说都是重要的、而且是我们感兴趣的信息。访谈时间大约 45 分钟，并将全程录音。在开始之前，我们声明：我们不会向研究团队以外的其他人透露这些信息。谈话录音将以匿名方式（仅标记 ID 号码）保存在我们办公室（的电脑）里。

2. 人口信息学资料

- a) 出生日期
- b) 出生地
- c) 居住地
- d) 生活状况：独自生活/与伴侣共同生活/与孩子（或孙子、孙女、外孙子、外孙女）共同生活/与其他人共同生活
- e) 教育水平
- f) （从前的）职业

3. 受访者的基本情况

在我们开始之前，我想了解您的一些基本情况，您看可以吗？如果您有什么问题，也可以随时问我，我会回答您。这是为了了解您的日常生活是什么样的。

- a) 您能告诉我您的日常生活情况吗？

- a. 您通常每天都做什么？您还在上班吗？您做什么工作？您有什么兴趣爱好？您经常（定期）看到朋友或家人吗？
- b. 您对自己的日常生活感到满意吗？有什么想改变的地方吗？许多人经受着压力，例如他们的工作带来的压力。您是否经历过某种职业压力？您还有其它严重影响您日常生活的压力吗？

4. 对于健康生活方式自我管理的看法/观点

我前面曾说过，我们正在研究健康的生活方式。我想和您谈谈与您健康有关的习惯，比如吸烟和锻炼身体/体力活动，您看可以吗？

- a) 您能告诉我一些您的生活方式吗？
 - a. 您热衷于体育运动/身体活动吗？您平常做什么类型的运动？
 - b. 您的饮食是什么样子的？描述一下您白天吃什么食物。您自己做饭，还是别人给您做饭？
 - c. 您吸烟吗？您经常抽什么样的烟？（每天）抽多少？您多大年龄开始抽烟？
 - d. 您喝酒吗？您经常喝什么酒？（每天）喝多少？您多大年龄开始喝酒？
- b) 每个人都有些健康或不健康的行为或习惯。有些人试图将某些行为改变为更健康的行为。您有没有尝试过改变您的（某某 XX）行为？*[对调查员：请根据他们之前提到的不健康习惯提相应/适当的问题]*
 - a. 您有没有尝试过增加体育锻炼/体力活动（例如为了减肥）？
 - i. 您为什么去锻炼身体/增加体力活动？有什么起因吗？
 - ii. 您是怎么做的？
 - iii. 您是否设法增加您的体育活动？哪些方面影响/妨碍您加强体育活动？*[对于调查员：考虑与工作有关的压力，照料他人，经济问题，环境方面等。]*哪些方面帮助您增加体育活动？*[对于调查员：考虑来自其他人的支持，医护人员的支持，看到（行为）改变的结果等]*
 - b. 您尝试过将您的饮食改变为更健康的饮食了（例如，为了减肥）吗？

- i. 您为什么要那么做？有什么起因吗？
 - ii. 您改变了哪些饮食/您是怎么做到的？
 - iii. 您成功改变了您的饮食习惯了吗？在哪些方面使您难以改变饮食习惯？*[对调查员：考虑工作相关的压力、照顾他人、经济问题、环境方面等]* 哪些方面帮助您改变了饮食习惯？*[对调查员：考虑来自他人、医疗工作者的帮助，是否看到改变的结果等]*
- c. 您尝试过戒烟吗？
 - i. 您为什么戒烟了？有什么起因吗？
 - ii. 您是如何做到的？
 - iii. 您成功戒烟了吗？哪些方面妨碍您戒烟？*[对调查员：考虑工作相关的压力、照顾他人、经济问题、环境方面等]* 哪些方面帮助您戒烟？*[对调查员：考虑来自他人、医疗工作者的帮助，是否看到改变的结果等]*
- d. 您尝试过戒酒吗？
 - i. 您为什么戒酒了？有什么起因吗？
 - ii. 您是如何做到的？
 - iii. 您成功戒酒/减少饮酒了吗？哪些方面妨碍您戒酒？*[对调查员：考虑工作相关的压力、照顾他人、经济问题、环境方面等]* 哪些方面帮助您戒掉/减少了饮酒？*[对调查员：考虑来自他人、医疗工作者的帮助，是否看到改变结果等]*
- e. 您尝试过改变您的其它行为了吗？
 - i. 您改变了什么？
 - ii. 您为什么要这么做？有什么起因吗？
 - iii. 您是怎么做到的？成功了吗？哪些方面妨碍您改变这些行为？*[对调查员：考虑工作相关的压力、照顾他人、经济问题、环境方面等]* 哪些方面帮助过您改变这些行为？*[对调查员：考虑来自他人、医疗工作者的帮助，是否看到改变结果等]*

- c) 当您试图改变您的（某某 XX）行为时，您是否寻求过他人的帮助？*[请就受访者提及的一次或多次改变行为的尝试做相应提问]*
- a. *[如果（回答）没有]* 您没能寻求帮助的理由是什么？您寻求帮助时感到犹豫/不好意思吗？还是因为那时找不到能帮助您的人？您有没有考虑过寻求其他人的帮助吗？
 - b. *[如果（回答）有]* 您向谁寻求过帮助？您为什么向这个人寻求帮助呢？他/她能帮助您继续改变您的行为吗？他/她是如何做到的？

5. 心血管和/或脑血管疾病、痴呆以及相关疾病的风险

我前面曾说过，我们目前正在开发一种智能手机应用程序，可以帮助人们生活得更健康，从而降低他们患痴呆和其他疾病的风险，例如心血管和脑血管疾病。我想和您谈谈这些疾病。

- a) 您认识痴呆患者吗？或者您对痴呆有所了解吗？
 - a. 您对这种疾病了解多少？
 - b. 您如何看待自己罹患痴呆的风险？您害怕/担心得这个病吗？
 - c. 您觉得您能做什么努力/事情来预防痴呆发生呢？您做了哪些事情来预防痴呆发生？
- b) 您认识患有心脑血管疾病的人吗，例如心脏病或脑卒中/中风？
- c) 您自己患过这些疾病吗？
 - a. *[如果没有]* 您知道您有哪些危险/易患此病的因素吗？您如何看待自己会患上这些疾病的风险？您害怕/担心患此病吗？您觉得您能做什么努力/哪些事情来预防这些疾病呢？有什么方法可以预防心脑血管疾病吗？
 - b. *[如果有]* 您如何看待您再次患此类疾病的风险呢？您害怕吗？您认为您能做什么努力来预防这些疾病呢？自从患了心脑血管疾病后，您的行为有哪些改变吗？
- d) 您有没有心血管疾病危险因素？
 - a. 您超重么？*[如果有]*从何时开始您超重？
 - b. 您有高血压么？*[如果有]* 您知道您有高血压多久了？您是否吃降压药？
 - i. 说一下您的用药情况？你多久吃一次药？您服用不同的药物吗？您服药有困难吗？

- c. 您有高胆固醇么？*[如果有]*您知道您有高胆固醇多久了？您是否服用他汀类药物？
- i. 说一下您服用他汀类药物的情况？您多久吃一次药？你服用不同的药物吗？您服药有困难吗？
- d. 您有糖尿病么？*[如果有]*您患糖尿病多久了？您知道怎样才能最好地控制糖尿病吗？您对[血糖或糖化血红蛋白]的目标值了解多少？
- i. 您服用治疗糖尿病的药物吗？您多久吃一次药？您吃不同的药物吗？您服药有困难吗？
- e) 您能想到其它心血管疾病的潜在危险因素吗，比如二手烟？*[当你一同居住的人有某种（不健康的）行为时，您将很难改变生活方式。如果有人与伴侣、其他家庭成员或室友住在一起：]* 您能告诉我您的伴侣/家庭成员/室友的生活方式和危险因素吗？他们吸烟/喝酒/有某些不太健康的饮食习惯吗？这在多大程度上影响了您自己的健康行为？例如，您的伴侣/家庭成员/室友是否参与烹饪您的饭菜？

6. 对通过移动医疗 / 生活方式 管理软件 (apps) + 远程指导来保持的生活方式改变的看法

正如我在介绍中所说，我们的目的是设计一款智能手机或平板电脑应用程序/软件 (app)，它可以帮助您改善您的生活方式行为，并降低您患痴呆的风险。

- a) 您有智能手机*[就是具有应用软件 (apps) 的手机，例如能使用微信]*吗？
- a. 您用智能手机做什么？您什么时候使用它？*[在家中使用、或在乘坐公共交通工具/购物时使用等]*
- b. 您需要别人（家人或朋友）指导您使用智能手机吗？
- b) 您有其它电子设备吗，比如台式电脑或笔记本电脑？
- a. *[如果有]* 有哪些事情您更喜欢用台式电脑/笔记本电脑/平板电脑处理，而不是用智能手机处理？为什么？
- c) 您有过使用智能手机来改善您的生活方式吗？*(例如，计算卡路里，促进体育锻炼，戒烟)*

- a. 那是什么样的应用程序（软件）（app）或网站？您什么时候开始使用的？使用得怎么样？这款软件是如何帮助您的？您喜欢它的哪些方面？您不喜欢它的哪些方面？您为什么不再使用这款软件了？您需要其他人（家人/朋友）来指导您使用这款软件吗？
 - b. 您使用这类软件进行健康管理您会有哪些担心？您对此类软件有什么需求或期望？
- d) 一款应用程序/软件能如何帮助您？
- a. 您认为一款（手机）软件（app）可以帮助您拥有更健康的生活方式吗？*[如果（回答）不能]* 为什么不能呢？
 - b. 您想使用这款 app 改变哪类行为呢？*[考虑增加体育锻炼，改变饮食，戒烟/戒酒等]* 为什么，有没有你认为自己永远无法改变的方面？
 - c. 这样一款（手机）软件（app）能为您做什么？
 - i. 您会使用这款（手机）软件（app）输入您的行为（例如：体育活动）或者（XX 行为的）结果（例如：您的体重）吗？*[如果（回答）否]* 为什么不呢？
 - ii. 您想要一款（手机）软件（app）方便与像您一样的人联系吗？*[如果（回答）是]* 您会如何使用这个功能？*[如果（回答）否]* 为什么不呢？
 - iii. 能通过这款（手机）软件（app）提供的健康生活方式的信息来帮助您吗，还是您更喜欢自己上网搜索（关于健康生活方式的信息）？
 - iv. 为了帮助您改善生活方式，您对这款（手机）软件（app）还有什么建议吗？
- e) 我们正在开发的这款 app 将会附带远程的（生活方式指导）教练/专业人员
- a. 您觉得这款 app 附上生活方式指导教练/专业人员怎么样？为什么会有（或会没有）帮助呢？您对这样的教练/专业人员指导有什么期望？
 - b. 在这样的教练指导下，您认为什么是重要的？*[教育、方法等]*
 - c. 在现实生活中与（生活方式指导）教练/专业人员见面对您来说重要吗？您喜欢以什么方式与（生活方式指导）教练/专业人员联系？*[微信/电话等/面对面/视频留言等]*

- d. 您希望多长时间和教练/专业人员联系一次？
- e. 您希望如何获得反馈？*[平台自动发送信息？短信？来自教练/专业人员的信息？]*
- f. 您使用微信吗？您每天平均使用微信多长时间？
- g. 您是否有兴趣关注健康医疗/卫生保健相关的微信公众号或微信小程序？
您希望我们通过微信还是（手机）软件（app）指导您的生活方式？

7. 访谈结束

我们的访谈快结束了，非常感谢您的帮助！

- 您还有什么要补充的吗？您还有什么问题要问吗？

Topic list

1. Introduction

My name is [name] and I work for [institution]. We are doing research on a healthy lifestyle. We are currently developing a smartphone application that should help people aged 55 years or older to live healthier, in order to decrease their risk to live healthier. There will also be a coach involved to help people with this. We want to understand what the wishes are of people aged 55 or older. I have conversations with some of those people and you are one of them. Thank you very much for participating in this interview!

We would like to talk with you about your lifestyle, for instance about your physical exercise, your diet and other habits. Our research subject is dementia. Dementia is an old age disease. For that reason we're looking for older people to talk with. We would like to talk with you about this disease. The interview will be about your experiences, so please tell us whatever you can think of. Everything you will tell us important and interesting for us. The interview will take about 45 minutes and will be audio taped. Before we start, I'd like to let you know that we will not share the information with other people outside our research team. The audio tapes will anonymously be stored in our office.

2. Demographics

- a) Date of birth
- b) Place of birth
- c) Place of residence
- d) Living situation: living on your own / living with a partner / living with (grand)children / living with others
- e) Level of education
- f) (Former) profession

3. Introduction of participant

Before we get started, I want to get to know you a little better. Would that be ok? Happy to tell you about me as well if you like. This is to discuss what your daily life looks like.

- a) Could you please tell me something about your daily life?
- a. What do you do on a regular day? Do you still work? What kind of work do you do? Do you have hobbies? Do you regularly see friends or family?
 - b. Are you happy with your daily life, or are there things you'd like to change? Many people experience stress, for example due to their work. Do you experience any occupational stress? Or are there any other stress factors that have considerable influence on your daily life?

4. View on self-management of a healthy lifestyle

As I told you, we are doing research on a healthy lifestyle. I'd like to talk with you about your habits that are related to your health, such as smoking and physical activity. Is that ok?

- a) Can you tell me something about your lifestyle behaviour?
- a. Are you physically active? What kind of activities do you do?
 - b. What does your diet look like? Describe me what kind of food you eat during the day. Do you cook yourself, or does somebody else cook for you?
 - c. Do you smoke tobacco? What kind of tobacco do you smoke? How much do you smoke? At what age did you start?
 - d. Do you drink alcohol? What kind of alcohol do you drink? How much do you drink? At what age did you start drinking?
- b) Everybody has certain behaviour or habits that are healthy or unhealthy. Some people try to change certain behaviour into more healthy behaviour. Have you ever tried to change certain aspects of your behaviour? *[to researcher: please ask that apply, according to their habits mentioned previously]*
- a. Have you ever tried to become more physically active (for example in order to lose weight)?
 - i. Why did you try that? Was there a trigger?
 - ii. How did you do that?
 - iii. Did you manage to increase your physical activity? What aspects made it hard to increase your physical activity? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]*
What aspects helped you to increase your physical activity? *[for researcher:*

think of support from others, support from healthcare workers, seeing results etc.]

- b. Have you ever tried to change your diet into a more healthy diet (for example to lose weight)?
 - i. Why did you try that? Was there a trigger?
 - ii. What did you change / How did you do that?
 - iii. Did you manage to change your diet? What aspects made it hard to change your diet? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]* What aspects helped you to change your diet? *[for researcher: think of support from others, support from healthcare workers, seeing results etc.]*
- c. Did you ever try to stop smoking tobacco?
 - i. Why did you try that? Was there a trigger?
 - ii. How did you do that?
 - iii. Did you manage to quit smoking? What aspects made it hard to quit smoking? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]* What aspects helped you to quit smoking? *[for researcher: think of support from others, support from healthcare workers, seeing results etc.]*
- d. Did you ever try to stop drinking alcohol?
 - i. Why did you try that? Was there a trigger?
 - ii. How did you do that?
 - iii. Did you manage to quit / decrease drinking? What aspects made it hard? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]* What aspects helped you to quit/decrease drinking? *[for researcher: think of support from others, support from healthcare workers, seeing results etc.]*
- e. Have you ever tried other aspects of your behaviour?
 - i. What did you change?
 - ii. Why did you try that? Was there a trigger?
 - iii. How did you do that? Was it successful? What aspects made it hard? *[for researcher: think of work-related stress, caring for others, financial problems, environmental aspects etc.]* What aspects helped you? *[for researcher: think of support from others, support from healthcare workers, seeing results etc.]*

- c) Did you ask for support of others, when you tried to change your behaviour? *[please relate to one or more attempts to change behaviour mentioned by the participant]*
- a. *[if no]* Why didn't you ask for support? Were you hesitant / embarrassed to ask somebody? Or was there nobody available? Have you considered to ask anybody for support?
 - b. *[if yes]* Who did you ask for support? Why did you ask this specific person? Could he/she help you to continue your behaviour change? How did he/she do this?

5. Risk of cardio- and/or cerebrovascular disease and dementia.

As I told you in the beginning, we are currently developing a smartphone application that should help people to live more healthy, in order to decrease their risk to develop dementia and other disease, such as cardiovascular disease and cerebrovascular disease. I'd like to talk with you about these diseases.

- a) Do you know people with dementia? Or do you know something about dementia?
 - a. What do you know about this disease?
 - b. How do you see your own risk to develop dementia? Do you fear that?
 - c. Do you have the feeling that there is anything you can do to prevent dementia? Are there things you do to prevent dementia?
- b) Do you know people who suffer from cardio- or cerebrovascular disease, such as a heart attack or stroke?
- c) Do you yourself suffer from such disease?
 - a. *[if no]* Do you know what risk factors you have? How do you see your own risk to suffer from such disease? Do you fear that? Do you have the feeling that there is anything you can do to prevent such disease? Are there things you do to prevent cardio- and cerebrovascular disease?
 - b. *[if yes]* How do you see your own risk to suffer again from such disease? Do you fear that? Do you have the feeling that there is anything you can do to prevent such disease? Are there things in your behaviour you have changed since the cardio- or cerebrovascular disease?
- d) Do you have cardiovascular risk factors?
 - a. Are you overweight? *[if yes]* since when are you overweight?

- b. Do you have high blood pressure? *[If yes]* How long do you know that you have high blood pressure? Do you use antihypertensive medication?
 - i. Tell me about the use of the medication. How often do you use it? Do you use different drugs? Do you have difficulties taking the medication?
- c. Do you have high cholesterol? *[If yes]* How long do you know that you have high cholesterol? Do you use statins?
 - i. Tell me about the use of the statins. How often do you use it? Do you use different drugs? Do you have difficulties taking the medication?
- d. Do you have diabetes? *[If yes]* How long do you know that you have diabetes? Do you know how diabetes is optimally controlled? What do you know about the target levels [of glucose or HbA1c]
 - i. Do you have medication for diabetes? How often do you use it? Do you use different drugs? Do you have difficulties taking the medication?
- e) Can you think of other potential risk factors for cardiovascular disease, such as second hand smoking? *[It can be hard to change lifestyle when the person(s) you live with has certain (unhealthy) behaviour. If somebody is living with a partner, other family members or roommates:]* Can you tell me something about the lifestyle and risk factors of your partner / family member / roommate?

Do they smoke tobacco / do they drink / do they have certain less healthy diet habits?
To what extent does that influence your own healthy behaviour? For example, is your partner / family member / roommate involved in cooking your meals?

6. View on sustained lifestyle changes through mHealth / lifestyle apps + remote coach

Like I said in my introduction, we aim to design an app for the smartphone or tablet that could help you to improve your lifestyle behaviour and to decrease dementia risk.

- a) Do you have a smartphone *[mobile phone with apps, such as Wechat]*?
 - a. What do you use your smartphone for? When do you use it? *[use at home, or also use in public transport / while shopping etc.]*
 - b. Do you need others (family or friends) to help you with the smartphone?
- b) Do you have other devices, such as desktop computer or laptop?

- a. *[If yes]* What things do you prefer to do with your computer / laptop / tablet instead of your smartphone? Why?
- c) Have you ever used your smartphone to improve your lifestyle? *[I.e. apps to count calories; to improve physical activity; quit smoking]*.
 - a. What kind of app / website was that? When did you start using it? How did that go? How did the app help you? What aspects did you like? What did you dislike? Why did you stop using the app? Did you need others (family / friends) to help you with the app?
 - b. What would you worry about health management using this kind of app? What would you request or expect on this app?
- d) How could an app help you?
 - a. Do you think that an app can help you to have a more healthy lifestyle? *[If not]* Why not?
 - b. For what kind of behaviour change would you use the app? *[think of increasing physical activity, diet change, quit smoking/drinking etc.]* Why? Are there any aspects you think you will never be able to change?
 - c. What should such an app be able to do for you?
 - i. Would you use the app to enter your behaviour (for example: physical activity) or the results (for example: your weight)? *[If not]* Why not?
 - ii. Would you like an app that facilitates contact with other people like you? *[If yes]* How would you use that function? *[If not]* Why not?
 - iii. Could the app help you by offering information about a healthy lifestyle, or do you prefer to search the internet yourself?
 - iv. Do you have other suggestions for the app to help you to improve your lifestyle?
- e) The app we are currently developing will be linked to a remote coach.
 - a. What would you think of a lifestyle coach, that is attached to the app? Why would(n't) that be helpful? What do you expect from such coaching?
 - b. What do you consider important in such a coach? *[education, approach etc.]*
 - c. Is it important for you to have met the coach in real life? What is your preferred way to have contact with the coach? *[Wechat / phone calls etc / face to face / video message etc.]*
 - d. How often would you like to have contact with the coach?
 - e. How would you prefer to receive feedback? *[Automatic? SMS? Message from coach?]*

- f. Do you use WeChat ? How long do you use WeChat on average?
- g. Do you follow with interest (pay attention to) the WeChat Public Number or WeChat applet related to health care? Would you prefer us to guide your lifestyle through WeChat or App?

7. End of interview

We have come to the end of our interview. Thanks so much for your help!

- Are there any things that you would want to add? Do you have any questions?

Translation

访谈话题

1. 介绍

我叫什么[姓名]，在[xx 机构]工作。我们正在做预防痴呆症的研究。我们目前正在开发一种智能手机应用程序/软件，可以帮助 55 岁或更大年龄的老人生活得更健康，从而降低他们患痴呆症的风险。使用过程中，会有一名（生活方式指导）教练/专业人员来帮助用户。我们想知道 55 岁或以上年龄的老人对此有什么期望（想法/需求）。我需要和这些人进行交谈来对此有所了解，您就是其中的一位。非常感谢您参加这次访谈！

访谈内容将是关于您的经历，所以您可以告诉我们您能想到的任何想法/相关的事情。您告诉我们的每件事对我们来说都是重要的、而且是我们感兴趣的信息。访谈时间大约 45 分钟，并将全程录音。在开始之前，我们声明：我们不会向研究团队以外的其他人透露这些信息。谈话录音将以匿名方式（仅标记 ID 号码）保存在我们办公室（的电脑）里。

2. 人口信息学资料

- a) 出生日期
- b) 出生地
- c) 居住地
- d) 生活状况：独自生活/与伴侣共同生活/与孩子（或孙子、孙女、外孙子、外孙女）共同生活/与其他人共同生活
- e) 教育水平
- f) （从前的）职业

3. 受访者的基本情况

在我们开始之前，我想了解您的一些基本情况，您看可以吗？如果您有什么问题，也可以随时问我，我会回答您。这是为了了解您的日常生活是什么样的。

- a) 您能告诉我您的日常生活情况吗？

- a. 您通常每天都做什么？您还在上班吗？您做什么工作？您有什么兴趣爱好？您经常（定期）看到朋友或家人吗？
- b. 您对自己的日常生活感到满意吗？有什么想改变的地方吗？许多人经受着压力，例如他们的工作带来的压力。您是否经历过某种职业压力？您还有其它严重影响您日常生活的压力吗？

4. 对于健康生活方式自我管理的看法/观点

我前面曾说过，我们正在研究健康的生活方式。我想和您谈谈与您健康有关的习惯，比如吸烟和锻炼身体/体力活动，您看可以吗？

- a) 您能告诉我一些您的生活方式吗？
 - a. 您热衷于体育运动/身体活动吗？您平常做什么类型的运动？
 - b. 您的饮食是什么样子的？描述一下您白天吃什么食物。您自己做饭，还是别人给您做饭？
 - c. 您吸烟吗？您经常抽什么样的烟？（每天）抽多少？您多大年龄开始抽烟？
 - d. 您喝酒吗？您经常喝什么酒？（每天）喝多少？您多大年龄开始喝酒？
- b) 每个人都有些健康或不健康的行为或习惯。有些人试图将某些行为改变为更健康的行为。您有没有尝试过改变您的（某某 XX）行为？*[对调查员：请根据他们之前提到的不健康习惯提相应/适当的问题]*
 - a. 您有没有尝试过增加体育锻炼/体力活动（例如为了减肥）？
 - i. 您为什么去锻炼身体/增加体力活动？有什么起因吗？
 - ii. 您是怎么做的？
 - iii. 您是否设法增加您的体育活动？哪些方面影响/妨碍您加强体育活动？*[对于调查员：考虑与工作有关的压力，照料他人，经济问题，环境方面等。]*哪些方面帮助您增加体育活动？*[对于调查员：考虑来自其他人的支持，医护人员的支持，看到（行为）改变的结果等]*
 - b. 您尝试过将您的饮食改变为更健康的饮食了（例如，为了减肥）吗？

- i. 您为什么要那么做？有什么起因吗？
 - ii. 您改变了哪些饮食/您是怎么做到的？
 - iii. 您成功改变了您的饮食习惯了吗？在哪些方面使您难以改变饮食习惯？*[对调查员：考虑工作相关的压力、照顾他人、经济问题、环境方面等]* 哪些方面帮助您改变了饮食习惯？*[对调查员：考虑来自他人、医疗工作者的帮助，是否看到改变的结果等]*
- c. 您尝试过戒烟吗？
 - i. 您为什么戒烟了？有什么起因吗？
 - ii. 您是如何做到的？
 - iii. 您成功戒烟了吗？哪些方面妨碍您戒烟？*[对调查员：考虑工作相关的压力、照顾他人、经济问题、环境方面等]* 哪些方面帮助您戒烟？*[对调查员：考虑来自他人、医疗工作者的帮助，是否看到改变的结果等]*
- d. 您尝试过戒酒吗？
 - i. 您为什么戒酒了？有什么起因吗？
 - ii. 您是如何做到的？
 - iii. 您成功戒酒/减少饮酒了吗？哪些方面妨碍您戒酒？*[对调查员：考虑工作相关的压力、照顾他人、经济问题、环境方面等]* 哪些方面帮助您戒掉/减少了饮酒？*[对调查员：考虑来自他人、医疗工作者的帮助，是否看到改变结果等]*
- e. 您尝试过改变您的其它行为了吗？
 - i. 您改变了什么？
 - ii. 您为什么要这么做？有什么起因吗？
 - iii. 您是怎么做到的？成功了吗？哪些方面妨碍您改变这些行为？*[对调查员：考虑工作相关的压力、照顾他人、经济问题、环境方面等]* 哪些方面帮助过您改变这些行为？*[对调查员：考虑来自他人、医疗工作者的帮助，是否看到改变结果等]*

- c) 当您试图改变您的（某某 XX）行为时，您是否寻求过他人的帮助？*[请就受访者提及的一次或多次改变行为的尝试做相应提问]*
- a. *[如果（回答）没有]* 您没能寻求帮助的理由是什么？您寻求帮助时感到犹豫/不好意思吗？还是因为那时找不到能帮助您的人？您有没有考虑过寻求其他人的帮助吗？
 - b. *[如果（回答）有]* 您向谁寻求过帮助？您为什么向这个人寻求帮助呢？他/她能帮助您继续改变您的行为吗？他/她是如何做到的？

5. 心血管和/或脑血管疾病、痴呆以及相关疾病的风险

我前面曾说过，我们目前正在开发一种智能手机应用程序，可以帮助人们生活得更健康，从而降低他们患痴呆和其他疾病的风险，例如心血管和脑血管疾病。我想和您谈谈这些疾病。

- a) 您认识痴呆患者吗？或者您对痴呆有所了解吗？
 - a. 您对这种疾病了解多少？
 - b. 您如何看待自己罹患痴呆的风险？您害怕/担心得这个病吗？
 - c. 您觉得您能做些什么努力/事情来预防痴呆发生呢？您做了哪些事情来预防痴呆发生？
- b) 您认识患有心脑血管疾病的人吗，例如心脏病或脑卒中/中风？
- c) 您自己患过这些疾病吗？
 - a. *[如果没有]* 您知道您有哪些危险/易患此病的因素吗？您如何看待自己会患上这些疾病的风险？您害怕/担心患此病吗？您觉得您能做些什么努力/哪些事情来预防这些疾病呢？有什么方法可以预防心脑血管疾病吗？
 - b. *[如果有]* 您如何看待您再次患此类疾病的风险呢？您害怕吗？您认为您能做些什么努力来预防这些疾病呢？自从患了心脑血管疾病后，您的行为有哪些改变吗？
- d) 您有没有心血管疾病危险因素？
 - a. 您超重么？*[如果有]*从何时开始您超重？
 - b. 您有高血压么？*[如果有]* 您知道您有高血压多久了？您是否吃降压药？
 - i. 说一下您的用药情况？你多久吃一次药？您服用不同的药物吗？您服药有困难吗？

- c. 您有高胆固醇么？*[如果有]*您知道您有高胆固醇多久了？您是否服用他汀类药物？
- i. 说一下您服用他汀类药物的情况？您多久吃一次药？你服用不同的药物吗？您服药有困难吗？
- d. 您有糖尿病么？*[如果有]*您患糖尿病多久了？您知道怎样才能最好地控制糖尿病吗？您对[血糖或糖化血红蛋白]的目标值了解多少？
- i. 您服用治疗糖尿病的药物吗？您多久吃一次药？您吃不同的药物吗？您服药有困难吗？
- e) 您能想到其它心血管疾病的潜在危险因素吗，比如二手烟？*[当你一同居住的人有某种（不健康的）行为时，您将很难改变生活方式。如果有人与伴侣、其他家庭成员或室友住在一起：]* 您能告诉我您的伴侣/家庭成员/室友的生活方式和危险因素吗？他们吸烟/喝酒/有某些不太健康的饮食习惯吗？这在多大程度上影响了您自己的健康行为？例如，您的伴侣/家庭成员/室友是否参与烹饪您的饭菜？

6. 对通过移动医疗 / 生活方式 管理软件 (apps) + 远程指导来保持的生活方式改变的看法

正如我在介绍中所说，我们的目的是设计一款智能手机或平板电脑应用程序/软件 (app)，它可以帮助您改善您的生活方式行为，并降低您患痴呆的风险。

- a) 您有智能手机*[就是具有应用软件 (apps) 的手机，例如能使用微信]*吗？
- a. 您用智能手机做什么？您什么时候使用它？*[在家中使用时、或在乘坐公共交通工具/购物时使用等]*
- b. 您需要别人（家人或朋友）指导您使用智能手机吗？
- b) 您有其它电子设备吗，比如台式电脑或笔记本电脑？
- a. *[如果有]* 有哪些事情您更喜欢用台式电脑/笔记本电脑/平板电脑处理，而不是用智能手机处理？为什么？
- c) 您有过使用智能手机来改善您的生活方式吗？*(例如，计算卡路里，促进体育锻炼，戒烟)*

- a. 那是什么样的应用程序（软件）（app）或网站？您什么时候开始使用的？使用得怎么样？这款软件是如何帮助您的？您喜欢它的哪些方面？您不喜欢它的哪些方面？您为什么不再使用这款软件了？您需要其他人（家人/朋友）来指导您使用这款软件吗？
 - b. 您使用这类软件进行健康管理您会有哪些担心？您对这类软件有什么需求或期望？
- d) 一款应用程序/软件能如何帮助您？
- a. 您认为一款（手机）软件（app）可以帮助您拥有更健康的生活方式吗？*[如果（回答）不能]* 为什么不能呢？
 - b. 您想使用这款 app 改变哪类行为呢？*[考虑增加体育锻炼，改变饮食，戒烟/戒酒等]* 为什么，*有没有你认为自己永远无法改变的方面？*
 - c. 这样一款（手机）软件（app）能为您做什么？
 - i. 您会使用这款（手机）软件（app）输入您的行为（例如：体育活动）或者（XX 行为的）结果（例如：您的体重）吗？*[如果（回答）否]* 为什么不呢？
 - ii. 您想要一款（手机）软件（app）方便与像您一样的人联系吗？*[如果（回答）是]* 您会如何使用这个功能？*[如果（回答）否]* 为什么不呢？
 - iii. 能通过这款（手机）软件（app）提供的健康生活方式的信息来帮助您吗，还是您更喜欢自己上网搜索（关于健康生活方式的信息）？
 - iv. 为了帮助您改善生活方式，您对这款（手机）软件（app）还有什么建议吗？
- e) 我们正在开发的这款 app 将会附带远程的（生活方式指导）教练/专业人员
- a. 您觉得这款 app 附上生活方式指导教练/专业人员怎么样？为什么会有（或会没有）帮助呢？您对这样的教练/专业人员指导有什么期望？
 - b. 在这样的教练指导下，您认为什么是重要的？*[教育、方法等]*
 - c. 在现实生活中与（生活方式指导）教练/专业人员见面对您来说重要吗？您喜欢以什么方式与（生活方式指导）教练/专业人员联系？*[微信/电话等/面对面/视频留言等]*

- d. 您希望多长时间和教练/专业人员联系一次？
- e. 您希望如何获得反馈？*[平台自动发送信息？短信？来自教练/专业人员的信息？]*
- f. 您使用微信吗？您每天平均使用微信多长时间？
- g. 您是否有兴趣关注健康医疗/卫生保健相关的微信公众号或微信小程序？
您希望我们通过微信还是（手机）软件（app）指导您的生活方式？

7. 访谈结束

我们的访谈快结束了，非常感谢您的帮助！

- 您还有什么要补充的吗？您还有什么问题要问吗？