

Perspectives of older cardiac patients towards lifestyle modification: a qualitative study

<i>Name student</i>	Simone Du Puy
<i>Student number</i>	5657407
<i>Status article</i>	Final
<i>Date</i>	28-06-2019
<i>Reference style</i>	Vancouver
<i>Supervisor</i>	P. Jepma, MSc, M. Snaterse, PhD. Amsterdam University of Applied Sciences, Amsterdam
<i>Course teacher</i>	Dr. M. van Dijk
<i>Course</i>	Research Internship 2: Master Thesis
<i>Criteria transparent rapportage</i>	COREQ
<i>Journal</i>	Heart
<i>Number of words</i>	
<i>Article</i>	3791
<i>Abstract</i>	297
<i>Samenvatting</i>	283

Master Course Clinical Health Science, Nursing Science, Utrecht University

ABSTRACT

Rationale: Cardiovascular diseases (CVDs) take the lives of millions of people every year. Due to the aging, there is a growing number of people with CVD, which results in an increased number of CVD-related hospital admissions. Secondary prevention is important to prevent recurrent cardiovascular events and consists of smoking cessation, healthier food choices and physical activity. These preventive activities are proven effective in every age, but lifestyle changes are difficult to maintain and it is unclear what older patients' perspectives are towards these lifestyle changes.

Aim: The aim of this study was to describe the perspectives of older cardiac patients towards lifestyle modification after a cardiac hospital admission.

Method: Using an exploratory qualitative generic approach, semi-structured face-to-face interviews were conducted with 13 participants who participated in the control group of the Cardiac Care Bridge program. Patients were older than 70 years and were admitted to the hospital in the past three months due to CVD. An interviewguide was developed using the ASE-model for behavior change. Thematic analysis according to Braun & Clarke was used.

Results: Several perspectives are seen towards lifestyle modification. Quality of life is important and the benefits of lifestyle changes are not clear. Analysis revealed five main themes: attitude; social norm; self-efficacy; barriers and stimuli; knowledge and skills.

Conclusion: Quality of life is an important factor why many participants make decisions to not make any lifestyle adjustments. It is being questioned what the benefits of lifestyle changes are for elderly in concrete terms. Participants are often being held back by physical impairments and unclear advice.

Recommendations: Further research is needed to investigate what the adjustments of the lifestyle actually yields for the elderly and how interventions can be personalized.

Keywords: *Cardiology [MeSH], Secondary prevention [MeSH], Aged [MeSH], Disease management [MeSH], Life style [MeSH]*

SAMENVATTING

Achtergrond: Het aantal mensen met cardiovasculaire aandoeningen (CVD) neemt toe, wat resulteert in een toenemend aantal ziekenhuisopnames door CVD. Wereldwijd overlijden er jaarlijks miljoenen mensen door CVD. Secundaire preventie is belangrijk om nieuwe cardiovasculaire episoden te voorkomen. Niet-farmacologische preventie bestaat uit het stoppen met roken, gezonder eten en meer bewegen. Deze interventies zijn effectief voor patiënten van elke leeftijd, maar het is moeilijk om leefstijl aan te passen en het is onduidelijk wat de perspectieven zijn van ouderen met cardiologische problematiek over leefstijlveranderingen.

Doel: Het doel van dit onderzoek is om de perspectieven van ouderen in kaart te brengen ten opzichte van leefstijlverbeteringen na een cardiologische ziekenhuisopname.

Methode: Een beschrijvende, generieke, kwalitatieve benadering is gebruikt waarbij 13 semi-gestructureerde interviews zijn afgenomen bij participanten die deelnemen aan controlegroep van de cardiologische zorgbrug studie. Deze participanten waren ouder dan 70 jaar en zijn in de afgelopen 3 maanden opgenomen geweest in het ziekenhuis vanwege cardiovasculaire aandoeningen. De interviewgide is opgesteld aan de hand van het ASE-model voor gedragsverandering.

Resultaten: Er zijn verschillende perspectieven omtrent het aanpassen van de leefstijl. Kwaliteit van leven is belangrijk en de voordelen van het aanpassen van de leefstijl zijn onduidelijk. Er zijn vijf hoofdthema's gevormd: attitude; sociale norm; eigen effectiviteit; barrières en stimuli; kennis en vaardigheden.

Conclusie: Kwaliteit van leven wordt gezien als een belangrijke factor om wel of geen leefstijlverbeteringen toe te passen. Participanten vragen zich af wat het aanpassen van een leefstijl concreet voor hen oplevert. Een belangrijke barrière voor het toepassen van leefstijlveranderingen zijn de fysieke beperkingen en de onduidelijke adviezen.

Aanbevelingen: Verder onderzoek is nodig naar wat leefstijlverbeteringen daadwerkelijk oplevert voor de ouderen en hoe interventies kunnen worden gepersonaliseerd.

Keywords: *Cardiologie, secundaire preventie, ouderen, ziektemanagement, leefstijl*

INTRODUCTION

Cardiovascular diseases (CVDs) take the lives of 17.9 million people every year, 31% of all global deaths.¹ In the Netherlands, the incidence of men and women aged over 70 years that were admitted to the hospital in 2018 due to CVD was around 180 thousand.² The prevalence of CVD increases with age.³⁻⁷ It is expected that due to aging of the population in the Netherlands, the number of patients with CVD will increase with 111% until 2024.²

CVD refers to all illnesses associated with heart and circulatory system.⁸ CVD can be caused by unmodifiable factors such as age, gender, family history and genetic predisposition for the disease. However, CVD can also be caused by modifiable risk factors such as diet, exercise and other lifestyle choices.^{1,8} To stop or slow down the progress of CVDs, secondary prevention is needed. Moreover, secondary prevention aims to improve functional capacity, to restore quality of life and to reduce the risk of disease recurrence.⁵ Secondary prevention can be pharmacological or non-pharmacological. Non-pharmacological secondary prevention includes smoking cessation^{4,5,9,10}, healthier food choices¹¹, regular physical activity^{11,12} and maintenance of ideal body weight.^{5,10,13,14} In addition, there are other prevention actions of CVD that can influence the course of the disease. Fluid volume restriction is one of these common preventive actions.^{15,16}

Research has shown that lifestyle changes influence the course of CVD.^{17,18} Patients often receive education about exercise, adoption of positive health behaviors and self-management skills¹⁹, but for many patients adherence to lifestyle advice is challenging.²⁰ Motivation for lifestyle changes is suggested to be a key factor in the success of secondary prevention¹⁸. Therefore, it is important to explore patients' goals of care when building a patient prevention plan.^{10,11} The occurrence of life events, such as a hospital admission, can contribute to health promotive behaviour.²¹

Lifestyle changes are necessary to decrease the risk of CVD and seem to be effective in older patients.¹⁰ However, there is insufficient research on lifestyle changes for the elderly. Currently, it is unclear what the views of older patients are towards lifestyle changes. To respond to their needs and adjust the lifestyle related care based on this, it is important that we explore the patients' perspectives towards lifestyle modification after a cardiac hospital admission.²²

AIM

The aim of this qualitative study was to describe the perspectives of older cardiac patients towards lifestyle modification after a cardiac hospital admission.

METHODS

Design

To gain insight in the perspectives of older cardiac patients towards lifestyle modification, a generic qualitative design was used.^{23,24} The consolidated criteria for reporting qualitative research (COREQ) checklist was used in writing this paper.²⁵

Study population

A purposeful sample of older cardiac participants was recruited from the control group of Cardiac Care Bridge program (CCB program) in the Netherlands. The sample aimed to provide maximum of variation in age, gender, educational level and cardiac diagnosis. The CCB program aimed to reduce unplanned hospital readmission and mortality in the first six months after hospital admission.²⁶ Patients in the intervention group received an integrated care plan, a face-to-face handover with the community care registered nurse (CCRN) before discharge and four home visits post-discharge. Patients in the control group received care as usual.²⁶ Patients were eligible to take part in this study when they met the following inclusion criteria: 1) age ≥ 70 , 2) cardiac hospital admission in the past three months due to Acute Myocardial Infarction (AMI) or Heart Failure (HF) and 3) discharged to home.

Data collection

Data were collected from January 2019 to May 2019. Semi-structured face-to-face interviews were conducted at the participants' home by the researcher (SP), who had no prior relation with the participants.

An interviewguide was developed using the ASE-model.^{27,28} This behaviour change model provides insight in behaviour by exploring attitude, social norm and self-efficacy and linking this with behaviour and behavioural intention.^{27,28} This model made it possible to explore the perceptions of the participants in a broad sense. Appendix I provides the interviewguide in Dutch.

Two pilot interviews were held to test the interviewguide and were positively evaluated by an experienced researcher (PJ). Therefore, the pilot interviews were included in the study. Data collection and analysis were performed iteratively²⁹, which meant that the researcher moved back and forth between sampling, data collection and analysis. The interviewguide was adjusted during the data collection and analysis. New questions were added and questions were specified based on the previous interviews to reach saturation on the perspectives of older cardiac patients. Recruitment ended when the researchers reached saturation of data after 13 interviews.

Procedures

The participants in the CCB study gave permission to be approached for further research. Potential participants were approached by telephone by the researcher (SP). When the participant agreed to participate, an appointment for the interview was made and an information letter and informed consent was sent.

Analysis

Thematic analysis according to Braun & Clarke was used, which is a suitable approach for analysis in generic qualitative research.³⁰ All interviews were recorded and transcribed verbatim by the researcher (SP). Each transcript was validated with the original recording for accuracy and to get familiar with the data. Two researchers (SP and PJ) coded the first five interviews independently and compared and discussed the initial codes until consensus was reached. The interviews that followed were coded by the researcher (SP), the codes and themes that followed were discussed by two researchers (SP and PJ) until agreement was reached. A third investigator was available when consensus was not reached. The program MAXQDA 2018³¹ (Berlin, Germany) was used to store and organize the data.

Trustworthiness

Investigator triangulation was used to enhance trustworthiness.³² Confirmability was illustrated through the presentation of the study methods, including transparency about the steps that involved participant recruitment, data collection and analysis. To increase the transferability of the findings, a rich description is provided through the inclusion of multiple quotes.

Ethical issues

The Medical Research Ethics Committee of the Amsterdam UMC hospital approved this study (Reference number W_15_299 # 15.0354). Written consent was obtained before the interview for involvement in the study and for the recording of the interview. At the start of the interview participants were reminded that they could leave the study at any time for any reason without consequences and that all information will be handled confidentially and anonymously.

The study was conducted according to the principles of the declaration of Helsinki³³ (64th WMA General Assembly, October 2013) and the European law General Data Protection Regulation (GDPR).³⁴ The anonymized data will be stored for 15 years on the secured network of the hospital of the research department (Amsterdam UMC).

RESULTS

Between January and May 2019, thirteen interviews were conducted. The mean age of the participants was 80 years. Eleven were male and two were female (see table 1). The interviews lasted an average of 45 minutes (range 20-85 min). Six participants had an informal caregiver who was present during the interview and supplemented the participant when necessary. Five main themes were obtained, which correspond to the ASE-model. Each theme has several sub-themes that further illuminated participants' perspectives towards lifestyle changes (see table 2).

Attitude

The attitude, the way how people feel or think²⁷, towards lifestyle modification and lifestyle behavior is a frequently mentioned theme and includes the sub-themes of "healthy living", "quality of life" and "what are the benefits".

Healthy living

For most participants a healthy lifestyle was already important before their hospital admission. Most participants indicate that they had a healthy lifestyle before admission. Some participants had already adjusted their lifestyle because of other comorbidities. These disorders already required lifestyle adjustments such as a low sodium diet, eating less fat and more physical activity.

"My kidneys cannot deal with it (...) it is difficult.. it is not that tasty anymore.. But you have to do it for yourself.." [low sodium diet] (P10, 87-year-old male, diagnosed with HF)

Quality of life

Although many participants find it important to work on their health to strengthen their health status and live longer, their short-term quality of life is more important than adjusting their lifestyle. Changing eating habits and alcohol use is associated with a reduced quality of life and therefore some participants make conscious decisions not make adjustments. This reduce in quality of life is not seen for the lifestyle physical activity.

"Imagine that I'm going to change my whole diet.. And eat even healthier, more fruit, more exercise and all those things. (...) Then quite a lot has to happen. What am I going to get out of it? How many years will I get, and what is the quality of life of the years that I will gain? Well I don't get the feeling that it would be beneficial for me." (P5, 74-year-old male, diagnosed with HF)

What are the benefits

Besides, participants are questioning what the benefits of lifestyle modifications are. Some have doubts about science. They wonder what changes will bring, how much longer will they live, what do they have to leave for it and what it means for them in concrete terms.

“So it is not a rule that you cannot deviate from, if you say that you no longer drink. You still have a 56 percent change that it will happen.. And what is the price that I have to pay for an improvement of so many percent. (...) I take that into account.” (P5, 74-year-old male, diagnosed with HF)

Social norm

Several perspectives are seen when it comes to social norm and social influence. This can be described as the processes in which people directly or indirectly influence thoughts, feelings and actions of others.²⁷ The participants were mainly influenced by their partner, children and healthcare professionals. Two sub-themes were established, namely “the doctor says so” and “the role of relatives and loved ones”.

The doctor says so

Some participants make adjustments in their lifestyle based on the advice of their doctor. These participants structurally follow the advice that is given, because they find the doctors' advice very important.

“I cannot say, I have received advice and put it aside. That does not feel right. There is nothing else to do then hear what they say and act on this, otherwise I might as well have not been admitted to the hospital.” (P3, 73-year-old male, diagnosed with HF)

The role of relatives and loved ones

Relatives and loved ones have an important role when it comes to lifestyle changes. Their support has a positive influence on making lifestyle adjustments. Especially for the lifestyle physical activity, they sometimes need to slow down their relative when they are exercising too much. On the other hand, they often need to stimulate their relative when it comes to start exercising. A few participants indicate that they sometimes find it annoying if relatives or loved ones interfere too much.

“My wife is also the type of uhh.. she said you should do 15 times why are you doing it more.. But that may be a bit stubborn of me, I don't know..” [slowing down in physiotherapy exercises] (P4, 81-year-old male, diagnosed with HF)

All participants stated that when they are living together with their partner, they take care of each other. Lifestyle adjustments such as a low sodium diet are mostly performed together, which often makes it easier to adjust their lifestyle.

“I: So your wife will recognize it if you don’t feel well, she then actually calls you back? R: Yes and sometimes it is the other way around that I say you should go out and stretch your legs.

*I: Is that what you say to her and she says to you? R: Yes.” (P2, 72-year-old male ,
diagnosed with HF)*

Self-efficacy

Self-efficacy refers to the participants’ confidence in their own ability to change their lifestyle.²⁷ Most participants stated that they did not find it difficult to adjust their lifestyle. They find themselves capable of changing the lifestyle. This is mainly the case when adjusting their diet.

*“I: Could you continue the salt restriction at home in once? R: Yes, immediately. I: Did you find that difficult? R: No. Because I was already used to it in the hospital, of course.” (P12,
83-year-old woman, diagnosed with HF)*

However, the fluid restriction after the hospital admission is a challenge for some participants, in particular adjustments affecting daily living are difficult. Participants are uncertain how to apply the advice in their routines. Despite these difficulties, participants are motivated to continue in a way that they think is right, to prevent recurrent hospital admission.

“R: I have been given a fluid restriction. I find that very difficult. I also get medication that stimulates thirst. I started to keep a tally in the hospital. (...) You can have one and a half liters. Well that took me effort. But I do stick to that.” (P9, 73-year-old male, diagnosed with HF)

Barriers and stimuli

Several barriers and stimuli towards lifestyle changes emerged. Three sub-themes have been established including: “physical impairments”, “external factors” and “stimuli”.

Physical impairments

The most important barrier is the physical impairments. Participants often want to change their lifestyle, but are being held back by other diseases. These diseases mostly influence on the physical activity, as a result of which the participants often cannot adhere to the exercises.

“I can no longer cycle, no air and my legs hurt. It is a combination of those two things.” (P2, 72-year-old male, diagnosed with HF)

External factors

External factors such as the weather do influence the participants. Participants are more likely to go outside for a walk when the weather is good. Whenever the weather is bad, it is a barrier towards physical activity.

Another factor that is seen as a barrier when it comes to a low sodium diet is that most food that can be bought in the grocery stores contains salt. Participants try to take the diet into account but find it difficult to purchase low-salt products.

“Yes, everything contains salt. If you go to the grocery stores and you take a jar of beans, that also contains salt.” (P10, 87-year-old male, diagnosed with HF)

Stimuli

There are various stimuli to be named to implement lifestyle adjustments. Most participants want to be able to live independently. To be able to do that, the participants want to work on their physical health. Therefore, staying independent is often seen as a stimulant to change the lifestyle. Another stimulus is that participants often do not want to be a burden for others. For that reason, they try to work on their health to remain as independent as much as possible.

“You have your groceries, mailboxes are gone, bus stops are gone.. We all had it at our doorstep here. Last week I had to go to the hospital, well now you walk that. And if you need anything, you will say I try. And if I succeed, then I can go a little further next time.” (P6, 89-year-old male, diagnosed with HF)

Knowledge and skills

There are two sub-themes that can be mentioned within the theme knowledge and skills; “advice” and “information seeking”.

Advice

There are many different professionals that advice the participants, among others the physiotherapist, cardiologist, general practitioner, heart failure nurse and dietician. These disciplines provide many recommendations, which can sometimes be contradictory. This makes it difficult for the participants to follow the advice properly.

“So, she says yes two glasses of wine. What if you make one glass of it? Later I also spoke to another doctor a bit more. She said yes she is completely crazy, don’t worry. If you were going to drink a lot of cognac or something crazy, then of course that is not good. But we will not look at one glass of wine.” (P6, 89-year-old male man, diagnosed with HF)

Especially when applying moisture restriction, it is seen that participants develop their own method and skills to apply this advice because the advice given is not sufficient.

“Yes, I find that very difficult. How do you classify that? They say that you also have to measure what you add with that yoghurt, I also have to count that. Yes, I would have drawn several glasses here and made a daily overview where my moisture would have been. I switched to smaller glasses, which was a transition. Now I also use cups a size smaller. (...) I found it difficult to be sure that I stayed below it.” (P3, 73-year-old male, diagnosed with HF)

Information seeking

Information seeking behavior refers to the way people search for and utilize information.³⁵ Besides the information that participants often get from professionals, participants gain information by other sources. The most used ways to seek information are internet and folders.

“And off to the internet. There I also read the tip from eh.. he already said whipped cream and cake. I believe there is a hospital somewhere in the Netherlands, they also gave the tip: cream, whipped cream.” (P12, 83-year-old female, diagnosed with HF)

DISCUSSION

This study aimed to describe the perspectives of older cardiac patients towards lifestyle modification after a cardiac hospital admission. This study shows that there are several perspectives towards lifestyle changes. Within the different components of the ASE-model we identified ten sub-themes as important. 1) quality of life, 2) what are the benefits, 3) healthy living, 4) the doctor says so, 5) the role of relatives and loved ones, 6) physical impairments, 7) external factors, 8) stimuli, 9) advice and 10) information seeking.

Participants find it important to work on their health to maintain or improve their health status in order to grow old and to stay independent. However, they question what lifestyle changes will bring them in concrete terms and weigh it against quality of life. Stop drinking alcohol and healthier food choices were mentioned as quality reducing lifestyle changes.

The doubts that participants have regarding to the benefits of lifestyle changes are grounded according to Fleg et al.³⁶ Participants experienced that lifestyle changes sometimes reduce quality of life, which is also what Rich et al.¹¹ stated. Despite the interventions that are invented, there is still controversy about the utility and intensity of secondary prevention in the elderly. The time to benefit is not clear, and it is unknown what the changes in lifestyle will yield specifically for elderly.^{11,36} Therefore, further research should focus on the benefits especially for the elderly.

Sometimes a seemingly simple factor actually plays a larger pivotal role in perceived quality of life, making it harder to change. For example when it comes to the use of alcohol, some participants pointed out that drinking alcohol was important for their quality of life because they associated it with having good social contacts. Bareham et al.³⁷ found that the use of alcohol could help sustain social and leisure activity.³⁷ They also described that a number of patients maintain their alcohol intake, despite concerns for their health.³⁷ Therefore, it seems that quality of life is often more important than adjusting the lifestyle. Given the current evidence, it is not known what this means for the older population.

Although fluid restriction is not a secondary prevention measure, it was seen by participants as an important change in the lifestyle. This lifestyle must be taken into account in preventing recurrent CVD hospital admissions.

The role of relatives, loved ones and caregivers is considered important in making lifestyle changes. Participants indicated that their support often has a positive influence on making lifestyle adjustments. This positive influence of loved ones is also seen in previous studies. Homish et al.³⁸ implied that married patients recover faster, have a decreased mortality rate and the rate of recurring CVD is lower.³⁸ Hence, it is desirable to involve relatives and loved ones when improving the lifestyle.

Physical impairments are seen as an important barrier towards exercise. Participants often were motivated to exercise more, but were being held back by other comorbidities. Nicolai et al.³⁹ indicated that physical impairments interfere with certain health goals and impeded changes.³⁹ Professionals need to take illness behavior into account and take a look if it really is impossible to exercise or are patients hiding behind their disease. Thus, it is important that professionals identify and discuss problem factors, such as physical impairments with the patient.

Strengths and limitations

The use of the ASE-model in the interview guide made sure all elements of behaviour change were discussed during the interviews and gave the opportunity to explore the perspectives of the participants in-depth. The ASE-model mainly focuses on conscious behavior. Behavior based on emotions is less apparent. Therefore, the use of the ASE-model might have caused a blind spot during interviews and analysis, by focusing on the conscious behavior. To prevent this, we performed the first five interviews and the full analysis with two researchers and discussed the interim results with the research group.

We included two women and eleven men, because coincidentally at the time of inclusion there were mainly men in the control group of the Cardiac Care Bridge. The number of men that were admitted to the hospital in 2018 due to CVD was around 100 thousand compared to 80 thousand woman.² The ratio differs from this study and previous research stated that gender is a factor that influences lifestyle habits.^{40,41} Therefore, the results of this study might not be generalizable for the whole population.

Implications for clinical practice and future research

This study shows that participants have different perspectives on lifestyle changes. The uncertainty about what benefits adjustment of lifestyle provide for the elderly is grounded.^{11,36} Besides, it is unknown what the time to benefit is for these lifestyle modifications. Further research is needed to investigate what benefits the adjustments of the lifestyle actually yields for the elderly and how long it takes to benefit.

Participants take several factors as quality of life, physical impairments and social norm into account when deciding whether or not to improve their lifestyle. Currently, there is not enough discussion with patients about their wishes and what they consider important towards their health. Therefore, it is important that professionals personalize the advice to the wishes and goals of the patient.¹⁰ Further research is needed to explore how professionals can connect best with their patients' needs and wishes.

CONCLUSIONS

In conclusion, there are various perspectives seen for older cardiac patients towards lifestyle modification. In general, when willing to change the lifestyle, participants do not find it hard to make adjustments. However, lifestyle changes are sometimes not made due to the impact on the quality of life. Besides, it is being questioned what benefits lifestyle changes will provide them in concrete terms regarding to living longer lives. When willing to change the lifestyle the most important factors are to grow old and to remain independent living, but participants are often being held back by physical impairments and unclear advice.

REFERENCES

1. WHO. Cardiovascular diseases (CVDs) [Internet]. 2018. p. 1–8. [cited 15 december 2018] Available from: [http://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](http://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds))
2. De Boer AR, van Dis I, Visseren FLJ, Vaartjes I BM. Hart- en vaatziekten in Nederland 2018. Hartstichting [Internet]. 2018;(December):132. [cited 15 december 2018] Available from: http://www.hartstichting.nl/9800/13341/15305/HVZ_in_Nederland_2010
3. Buddeke J, Valstar GB, van Dis I, Visseren FLJ, Bots ML, den Ruijter HM VI. Hart- en vaatziekten in Nederland 2017. Hart- en vaatziekten Ned 2017, cijfers over leefstijl, Risicofact ziekte en sterfte. 2017;61–70.
4. Damluji AA, Ramireddy A, Otalvaro L, Forman DE. Secondary cardiovascular prevention in older adults: an evidence based review. J Geriatr Cardiol 459–464 J Geriatr Cardiol. 2015;12(12):459–64.
5. Piepoli MF, Hoes AW, Agewall S, Albus C, Brotons C, Catapano AL, et al. 2016 European Guidelines on cardiovascular disease prevention in clinical practice. Eur Heart J. 2016;37(29):2315–81.
6. Benjamin EJ, Virani SS, Callaway CW, Chang AR, Cheng S, Chiuve SE, et al. Heart Disease and Stroke Statistics—2018 Update: A Report From the American Heart Association. Circulation. 2018. 67–492 p.
7. Bell SP, Orr NM, Dodson JA, Rich MW, Wenger NK, Blum K, et al. What to expect from the evolving field of geriatric cardiology. J Am Coll Cardiol. 2015;66(11):1286–99.
8. Karunathilake SP, Ganegoda GU. Secondary Prevention of Cardiovascular Diseases and Application of Technology for Early Diagnosis. Biomed Res Int. 2018;2018.
9. The Clinical Practice Guideline Treating Tobacco Use and Dependence 2008 Update Panel L and S. A Clinical Practice Guideline for Treating Tobacco Use and Dependence: 2008. Am J Prev Med. 2008;2(35):158–76.
10. Orkaby A, Onuma O, Qazi S, Gaziano M, Driver J. Preventing cardiovascular disease in older adults: One size does not fit all? Cleve Clin J Med. 2018;85(1):55–64.
11. Rich M. Secondary prevention of cardiovascular disease. Prog Cardiovasc Dis. 2014;57(3):168–75.
12. Hakim AA, Curb JD, Petrovitch H, Rodriguez BL, Yano K, Ross W, et al. Effects of Walking on Coronary Heart Disease in Elderly Men. Circulation. 1999;100:9–13.
13. Mosleh SM, Almalik MMA. Illness perception and adherence to healthy behaviour in Jordanian coronary heart disease patients. Eur J Cardiovasc Nurs. 2014;15(4):223–30.
14. Kähkönen O, Kankkunen P, Saaranen T, Miettinen H, Kyngäs H, Lamidi ML. Motivation

- is a crucial factor for adherence to a healthy lifestyle among people with coronary heart disease after percutaneous coronary intervention. *J Adv Nurs*. 2015;71(10):2364–73.
15. Miller RK, Thornton N. Does Evidence Drive Fluid Volume Restriction in Chronic Heart Failure? *Nurs Clin North Am*. 2017;52(2):261–7.
 16. Yancy CW, Jessup M, Bozkurt B, Butler J, Casey DE, Drazner MH, et al. 2013 ACCF/AHA Guideline for the Management of Heart Failure: Executive Summary. *Circulation*. 2013;128(16):1810–52.
 17. Cole JA, Smith SM, Hart N, Cupples ME. Systematic Review of the Effect of Diet and Exercise Lifestyle Interventions in the Secondary Prevention of Coronary Heart Disease. 2011;2011(Mi).
 18. Nissen NK, Jónsdóttir M, Spindler H, Zwisler ADO. Resistance to change: Role of relationship and communal coping for coronary heart disease patients and their partners in making lifestyle changes. *Scand J Public Health*. 2018;46(6):659–66.
 19. Cleary K, LaPier T, Beadle C. Exercise Adherence Issues, Behavior Change Readiness, and Self-Motivation in Hospitalized Patients with Coronary Heart Disease. *J Acute Care Phys Ther (Acute Care Sect - APTA, Inc)*. 2011;2(2):55–63.
 20. Fållun N, Fridlund B, Schaufel MA, Schei E, Norekvål TM. Patients' goals, resources, and barriers to future change: A qualitative study of patient reflections at hospital discharge after myocardial infarction. *Eur J Cardiovasc Nurs*. 2016;15(7):495–503.
 21. Andersson L, Stanich J. Life Events, Health Attitudes, and Health Behavior Questionnaire. *PsycTESTS*. 1996;23:163–77.
 22. Perk J, De Backer G, Gohlke H, Graham I, Reiner Ž, Verschuren M, et al. European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). *Eur Heart J*. 2012;33(13):1635–701.
 23. Kahlke RM. Generic qualitative approaches: Pitfalls and benefits of methodological mixology. *Int J Qual Methods*. 2014;13(1):37–52.
 24. Al-Busaidi ZQ. Qualitative research and its uses in health care. *Sultan Qaboos Univ Med J*. 2008;8(1):11–9.
 25. Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research: A 32-item checklist for interviews and focus groups. *Int J Qual Heal Care*. 2018;19(6):349–57.
 26. Verweij L, Jepma P, Buurman BM. The Cardiac Care Bridge program: design of a randomized trial of nurse-coordinated transitional care in older hospitalized cardiac patients at high risk of readmission and mortality. 2018;1–30.
 27. De Vries H, Backbier E, Kok G, Dijkstra M. The Impact of Social Influences in the Context of Attitude, Self-Efficacy, Intention, and Previous Behavior as Predictors of Smoking Onset. *J Appl Soc Psychol*. 1995;25(3):237–57.

28. Willemsen MC, De Vries H, Van Breukelen G, Oldenburg B. Determinants of intention to quit smoking among Dutch employees: The influence of the social environment. *Prev Med (Baltim)*. 1996;25(2):195–202.
29. Moser A, Korstjens I. Series: Practical guidance to qualitative research. Part 3: Sampling, data collection and analysis. *Eur J Gen Pract*. 2018;24(1):9–18.
30. Braun, Virginia.; Clarke V. Using Thematic Analysis in Psychology. *Qual Res Psychol*. 2006;3(2):77–101.
31. MAXQDA. What is MAXQDA? [Internet]. 2018. [cited 15 december 2018] Available from: <https://www.maxqda.com/what-is-maxqda>
32. Korstjens I, Moser A. Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *Eur J Gen Pract*. 2018;24(1):120–4.
33. World Medical Association. WMA Declaration Of Helsinki. *W*. 2013;(June 1964):29–32.
34. The European Parliament and The European Council. General Data Protection Regulation. *Off J Eur Union*. 2016;20–30.
35. Kundu DK. Models of information seeking behaviour: a comparative study. *Int J Libr Inf Stud*. 2017;7(4):393–405.
36. Fleg JL, Forman DE, Berra K, Bittner V, Blumenthal JA, Chen MA, et al. Secondary prevention of atherosclerotic cardiovascular disease in older adults: A scientific statement from the American heart association. *Circulation*. 2013;128(22):2422–46.
37. Bareham BK, Kaner E, Spencer LP, Hanratty B. Drinking in later life: A systematic review and thematic synthesis of qualitative studies exploring older people's perceptions and experiences. *Age Ageing*. 2019;48(1):134–46.
38. Homish G. Spousal Influence on General Health Behaviors in a Community Sample. Vol. 32, *American Journal of Health Behavior*. 2012.
39. Nicolai J, Müller N, Noest S, Wilke S, Schultz JH, Gleißner CA, et al. To change or not to change – That is the question: A qualitative study of lifestyle changes following acute myocardial infarction. *Chronic Illn*. 2018;14(1):25–41.
40. Vari R, Scazzocchio B, D'Amore A, Giovannini C, Gessani S, Masella R. Gender-related differences in lifestyle may affect health status. *Ann Ist Super Sanità*. 2014;52(2):158–66.
41. Mosca L, McGillen C, Rubenfire M. Gender Differences in Barriers to Lifestyle Change for Cardiovascular Disease Prevention. Vol. 7, *Journal of Women's Health*. 1998. p. 711–5.

APPENDIX I Interviewguide

Introductie

Allereerst heel erg bedankt dat u mee wilt werken aan het interview.

Voorstellen

Informatiebrief

Heeft u de Informatiebrief ontvangen? Indien nee: informatiebrief nog doornemen

Informatie/ doel van het onderzoek

Wanneer u wordt opgenomen op de afdeling cardiologie, krijgt u afhankelijk van de reden van opname adviezen over het verbeteren van uw leefstijl. U kan bijvoorbeeld het advies hebben gekregen om te stoppen met roken, meer te bewegen en gezond te eten. Het naleven van deze leefstijladviezen is vaak moeilijk omdat het om een aanpassing in het dagelijks leven gaat. We willen graag weten wat uw ervaring is hiermee zodat we in de toekomst mogelijk de behandeling hier beter op kunnen afstemmen.

Duur van het interview en geluidsopnames

Het interview zal ongeveer 1 tot 1,5 uur duren en zal worden opgenomen zodat de onderzoeker het later nog kan terugluisteren bij het uitwerken van het interview. Hierna worden de opnames vernietigd.

Informed consent tekenen

Introducerende vragen

Vooraf inlezen en aan de hand daarvan beginnen:

1. U bent recent opgenomen geweest op de afdeling cardiologie i.v.m. (...), kunt u mij vertellen wat er is gebeurd?
 - a. In hoeverre vond u de reden van uw ziekenhuisopname ernstig? (*Perceived seriousness of disease*)
2. Hoe zou dat zo gekomen kunnen zijn, dat u zo'n last heeft van (...) / bekend bent met (...)?
 - a. Kunt u iets vertellen over hoe erg u het vindt dat u bekend bent met (...)? (*Perceived seriousness of disease*)
 - b. Vindt u het zorgelijk dat u lijdt aan (...)? (*Perceived seriousness of disease*)
3. In hoeverre denkt u dat wat u heeft meegemaakt (...) nog een keer kan gebeuren? (*Perceived severity of disease*)
4. Zijn er naar uw idee gewoontes in uw leefstijl (nu of vroeger) die mogelijk van invloed zijn geweest op het ontstaan van (...)?
 - a. Zo ja, welke invloed denkt u dat dit heeft op het ontstaan van (...)?
 - b. Zo nee, hoe denkt u dan dat (...) is gekomen?

5. In hoeverre bent u bezig om aan uw gezondheid te werken?
 - a. Vindt u dat belangrijk?

Wanneer geen leefstijlfactor wordt genoemd:

U gaf aan (bij 4) dat u het niet echt belangrijk vindt om aan uw gezondheid te werken.

- Kunt u daar iets meer over vertellen?
- Op welke manier probeert u aan uw gezondheid te werken?

Diepgang (*n.a.v. introducerende vragen*)

Oke u denkt dat deze leefstijlfactoren (...) hebben bijgedragen aan het probleem. Ik zou daar graag wat meer over te weten willen komen. Vind u het goed als we het dan nu een voor een daarover gaan hebben?

6. U vertelde (*bij 2*) dat u denkt dat leefstijlfactor (...) misschien wel heeft bijgedragen aan het probleem. Is dat iets wat u bezighoudt? (Attitude)
 - a. Hoe ziet u dat?
 - b. Wat vindt u daarvan?
7. Heeft u over (...) weleens informatie gekregen? (Attitude)
 - a. Kunt u hier wat meer over vertellen?
 - b. Wat vond u van deze informatie?
 - c. Van wie heeft u deze informatie?
8. Nu weten we dat het voor mensen best moeilijk kan zijn om aan hun gezondheid te werken omdat het soms moeilijk is gewoontes aan te passen in het dagelijks leven. Vindt u het moeilijk om aan uw (...) te werken? (Attitude)
 - a. Kunt u daar iets meer over vertellen?

We hebben het net gehad over leefstijlfactor (...). U zei dat (...) belangrijk is voor u.

We weten dat de omgeving belangrijk kan zijn bij het in stand houden of veranderen van de leefgewoontes in het dagelijks leven. Soms zijn deze mensen heel behulpzaam en steunend terwijl in andere gevallen het ook kan zijn dat andere mensen de aanpassingen wat moeilijker maken.

9. In hoeverre zijn de mensen om u heen (*bijvoorbeeld uw partner, kinderen of ander persoon dichtbij*) betrokken bij u met betrekking tot (...)? (Sociale invloed)
 - a. Kunt u daar wat meer over vertellen?
10. Ervaart u steun van de mensen om u heen met betrekking tot (...)? (Sociale invloed)
 - a. Kunt u daar wat meer over vertellen? Hoe ervaart u dat? Waar merkt u dat aan?
 - b. Welke invloed heeft dit voor u op (...)?

11. Zijn er ook mensen om u heen die u niet echt steunen met betrekking tot (...)? (Sociale invloed)

Zo ja:

- a. Kunt u dat toelichten? Waar merkt u dat aan?
- b. Welke invloed heeft dit voor u op (...)?
- c. Hoe gaat u hier mee om?

12. We hebben het er net al even over gehad waar u graag aan zou willen werken (Of waar u misschien al aan werkt). Nu weten we dat sommige mensen het heel lastig vinden om hier ook mee aan de slag te gaan. Hoe is dat voor u? (Eigen effectiviteit)

- a. Hoe vindt u dat het u af gaat om aan (...) te werken?
 - i. Positief: zijn er naast de eerdergenoemde factoren nog andere factoren die maken dat het u zo goed af gaat?
 - ii. Negatief: zijn er naast de eerdergenoemde factoren nog andere factoren die (...) bemoeilijken?

13. Denkt u dat u in staat bent om leefstijlverbeteringen met betrekking tot (...) uit te kunnen voeren? (Eigen effectiviteit)

Zo ja:

- a. Hoe zou u dat aanpakken? Of hoe heeft u dat aangepakt?
- b. Wat heeft u (nog) nodig?

Zo nee:

- a. Wat maakt dat u denkt dat u niet in staat bent om leefstijlverbeteringen met betrekking tot (...) uit te voeren?
- b. Wat zou u nodig hebben / wat zou er voor kunnen zorgen dat u (...) wel zou kunnen uitvoeren?

14. Heeft u eerder al een poging gewaagd met betrekking tot (...)? (Eigen effectiviteit)

Zo ja:

- a. Kunt u daar wat meer over vertellen?
- b. Wat maakte dat het toen wel / niet lukte?
- c. Kunt u specifieke momenten benoemen dat het wel / niet lukte?
- d. Heeft u een idee waarom u daarna weer begonnen bent met (...)?

Zo nee: door naar vraag 15.

15. U vertelde net (bij ...) dat u denkt dat u wel in staat bent om de leefstijlverbeteringen met betrekking tot (...) uit te kunnen voeren en dat u dat op deze manier (...) gaat aanpakken. (Intentie)

- a. Hoe ziet u dat nu voor u?
- b. Binnen welke termijn bent u dat van plan?

16. In hoeverre denkt u dat (...) bijdraagt aan uw gezondheid? (Perceived benefits)
- Welke verwachtingen heeft u hierbij?
 - Zijn er nog andere voordelen voor u die mee zouden kunnen spelen?
17. Zijn er naast het letten op (...) nog andere dingen die u in het dagelijks leven doet voor uw gezondheid? (Attitude)
- Zo ja:*
- Kunt u hier iets meer vertellen?
- Opnieuw naar vraag 5-16 met de volgende leefstijlfactor**
- Zo nee: door naar vraag 17*
18. Zijn er ook aanpassingen waar u liever niets aan doet?
- Kunt u hier wat meer over vertellen? (Attitude)
 - Wat maakt dat u daar niets aan wil doen?
 - Heeft u hier in het verleden anders over gedacht?
19. Zijn er ook dingen die u doet om te voorkomen dat u weer in het ziekenhuis terecht komt?
- Kunt u hier wat meer over vertellen?
 - Wat maakt dat u dat wel / niet belangrijk vindt?
20. Gebruikt u medicatie?
- Kunt u hier wat meer over vertellen?
21. Zijn er medicijnen die u expres wel eens vergeet? (*wanneer het gaat over medicatie*)
- Wat maakt dat u dat wel / niet zou doen?

Afronding

22. Zijn er nog aspecten met betrekking tot leefstijlverbeteringen die nog niet aan de orde geweest zijn en die u nog graag zou willen bespreken?

Parafraseren

- Evaluatie
- Aanvullingen baseline
- Afsluiting

Table 1: Demographic Characteristics (N=13)

	N	%	Mean	SD	Median
Age (in years)			80,42	6,72	
Gender					
Male	11	85%			
Nationality					
Dutch	12	92%			
Surinam	1	8%			
Marital status					
Never married	3	23%			
Married	8	62%			
Divorced / widowed	2	15%			
Educational level					
Low	5	39%			
Middle	2	15%			
High	6	46%			
Cardiac diagnosis					
Heart failure	12	92%			
Acute Myocardial Infarction	1	8%			
Comorbidities (measured with the CCI)					
1	4	31%			
2	6	46%			
3	2	15%			
4	1	8%			
Comorbidities specified					
Kidney Failure	4	31%			
Diabetes Mellitus	4	31%			
Hypertension	7	54%			
Peripheral Vascular Disease	1	8%			
Cerebro Vascular Accident	1	8%			
Smoking status					
Non smoker	3	23%			
Formal smoker	9	69%			
Present smoker	1	8%			
SNAQ score					
0	7	54%			
1	2	15%			
2	1	8%			
≥ 3	3	23%			
BMI			24,1	3,26	
Years of illness			7,31	6,93	5

CCI: Charlson Comorbidity Index; SNAQ: Short Nutritional Assessment Questionnaire; BMI: Body Mass Index

Table 2: Overview of themes and sub-themes

Theme	Sub-themes
Attitude	Quality of life What are the benefits Healthy living
Social norm	The doctor says so The role of relatives and loved ones
Self-efficacy	
Barriers and stimuli	Physical impairments External factors Stimuli
Knowledge and skills	Advice Information seeking