"To be at one's best"
To the sunshine in my life, my daughter Ronia.

Success is not final,
failure is not fatal,
it is the courage to continue that counts
- Sir Winston Churchill
"To be at one's best"

- The evolution of Optimal Functionality and its possible implementation in an ICT-platform
Abstract

Samal Algilani (2016): “To be at one’s best” –The evolution of Optimal Functionality and its possible implementation in an ICT-platform. Örebro Studies in Health care Sciences 65

At the Nutrition and Physical Activity Research Centre for Optimal Health and Functionality through Life (NUPARC), a research gap was uncovered regarding the concept optimal functionality based on the older adult’s own perspective. The overall aim was to explore the concept of optimal functionality among older adults and the possibility of creating and developing an ICT-platform to measure it. **Method:** An existing cohort from NUPARC was used for recruitment in studies I-III and to some extent study IV. A scoping study design and framework was adopted for the inclusion of the articles in Study I. Study II had a descriptive design. Six focus group discussions were conducted and analysed using qualitative deductive content analysis to extend the qualitative understanding. Study III used a phenomenological approach describing the experience of mental health and its impact on the ability to function as optimally as possible. Six interviews were analysed using Giorgi’s phenomenological approach. Study IV was a feasibility study and included 8 older adults using an ICT-platform for a period of four weeks. **Results:** Optimal Functionality comprises three major cornerstones: Body-related factors, Self-related factors and External factors (I) accompanied by nine aspects, and according to older adults it is a matter of functioning as optimally as possible (II). The three major cornerstones are intricately linked and all but the mental aspects were included in the discussions (II). Life situations affecting mental health, consequences of mental health and strategies for maintaining good mental health were described by older adults as having an impact on mental health and affecting their ability to function as optimally as possible (III). The older adults managed the usage of an ICT-tool well and it was perceived as meaningful (IV). **Conclusion:** Optimal functionality is holistic, subjective, dynamic and applicable to all older adults. Identification of the factors involved can help the older adults on their path to health. An ICT-platform can facilitate the identification of the factors for optimal functionality and the eventual measurement of it.

**Keywords:** older adults, optimal functionality, scoping review, focus group, qualitative content analysis, mental health, interviews, phenomenological approach, ICT-platform

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"Att vara sitt bästa jag"
- Evolutionen av optimal funktionalitet och dess implementering i en IKT-plattform


Europeiska kommissionens hypotes är att införandet av olika IKT-lösningar (Informations- och Kommunikationsteknologi) för den äldre befolkningen kommer att möjliggöra en bättre hälsa hos dem. Men evi-
dens- och användarbaserade applikationer är få. Detta resulterar i att det
finns ett behov av att utveckla IKT-verktyg med den framtida målsättning-
en att mäta äldres hälsa.

Syfte: Det övergripande syftet med doktorandprojektet har varit att belysa
begreppet optimal funktionalitet bland äldre personer i studie I-III och
utveckla ett IKT-verktyg i studie IV för att i framtiden kunna mäta det.

Delarbete I syftade till att utforska vad begreppet optimal funktionalitet i
ålderdomen betydde utifrån den äldre personens perspektiv. En scoping
review genomfördes och för att generera lämpliga söktermer för litteratur-
sökning genomfördes två fokusgruppsdiskussioner där 15 äldre personer
medverkade. Den vägledande frågan var: vilka faktorer och funktioner
ligger till grund för optimal funktionalitet ur en äldre persons perspektiv?
De äldre ombads också att diskutera betydelsen av hälsa samt välmående.
Diskussionerna som spelades in på band analyserades med hjälp av inne-
hållsanalys. Den övergripande söktermen blev: personlig tillfredsställelse
(personal satisfaction). Två elektroniska databaser; PubMed och CINAHL
genomsöktes för att fånga begreppet optimal funktionalitet. Datuminter-
vallet var 2002-2012 för att återspegla den aktuella forskningen som på-
gått under en 10-årsperiod. Genom att analysera resultaten av dessa artik-
lar identifierades tre huvudteman som hörnstenar i begreppet optimal
funktionalitet i ålderdomen: 1) självrelaterade faktorer (t.ex. psykiskt väl-
befinnande); 2) kroppsrelaterade faktorer (t.ex. fysiskt välbefinnande); och
3) externa faktorer (demografiska och omgivande faktorer). Den slutsats
som kunde dras var att det fanns en brist på kvalitativa studier i den aktu-
ella litteraturen som studerats, och följaktligen av vad som utgjorde opti-
mal funktionalitet från den äldre personens perspektiv.

Delarbete II syftade därför till att utvidga förståelsen för optimal funkti-
onalitet genom fokusgruppsdiskussioner med olika grupper av äldre per-
soner. För att nå variationer av erfarenheter och uppfattningar ingick
olika grupper av äldre i studien, en grupp aktiva orienterare (n=14), en
grupp friska äldre som bodde i ordinärt boende (n=11), och en grupp
äldre personer som bodde i seniorboende, med behov av hjälp (n=12).
Diskussioner i sex fokusgrupper genomfördes och bandinspelades. Materialet analyserades med deduktiv innehållsanalys. De äldre beskrev kärnan i optimal funktionalitet som att fungera så optimalt som möjligt, det vill säga ”Att vara sitt bästa jag”. Fynden från studie I bekräftades, men flera nya faktorer framkom också och de tre hörnstenarna beskrevs som tätt sammanlänkade med varandra. Begreppets subjektivitet stärktes ytterligare i denna studie, dock talade studiedeltagarna inte om den mentala aspektens påverkan på optimal funktionalitet.

Delarbete III syftade därför till att beskriva upplevelsen av mental hälsa och dess inverkan på förmågan att fungera så optimalt som möjligt bland äldre personer med psykisk ohälsa. Sex kvinnor deltog i enskilda intervjuer och materialet analyserades med en fenomenologisk ansats. Resultatet visade en tredelad struktur som bestod av tre synteser: Livssituationer som påverkar den mentala hälsan, Konsekvenser av mental hälsa i vardagen och Strategier för att upprätthålla mental hälsa. Upplevelsen att fungera så optimalt som möjligt var i centrum och kunde påverkas av alltför synonymy, tillsammans utan inbördes ordning eller separat.

Sammanfattning

Utformandet av ett instrument implementerat i ett IKT-verktyg som främjar optimal funktionalitet kan leda till att den äldre blir mer självständig och kan uppleva hälsa. Därmed kan möjligheten till egenvård öka, som i sin tur kan leda till att den äldre blir en resurs för sig själv, sin familj och det samhälle de lever i. Att identifiera faktorer som bidrar till förmågan att fungera så optimalt som möjligt kan därmed fungera som en facilitator för ett liv på egna villkor.

Resultatet av detta forskningsprojekt kan användas för att identifiera vilka faktorer som är viktiga för den äldre, enligt den äldre själv. Begreppet optimal funktionalitet som det ser ut just nu kan introduceras på seminarier för forskare, på sjukhus för vårdpersonal samt på olika organisationer för äldre för att informera och belysa subjektiviteten av begreppet och möjligheten att identifiera faktorer för optimal funktionalitet.
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My wonderful daughter, Ronia, for being the sunshine in my life. This thesis is dedicated to you, to show you that with hard effort you can do anything you set your mind to.

My mother, I would like to share this thesis with you. Thank you for being there for me whenever I needed you, for helping me out in challenging times and for always doing it with a smile; you are always trying to make things easier for me. Without you this thesis would not exist.

My appologies if I have forgotten anyone. Remind me and I will be sure to thank you in person.
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Samal Algilani, Lina Östlund-Lagerström, Annica Kihlgren, Ida Schoultz, Agneta Schröder. Submitted

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Samal Algilani, Ann Langius-Eklöf, Annica Kihlgren, Karin Blomberg. Submitted

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## Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AgeCAP</td>
<td>Multidisciplinary research for capable ageing</td>
</tr>
<tr>
<td>ARC</td>
<td>Aging Research Centre</td>
</tr>
<tr>
<td>FL</td>
<td>Free living (older adults)</td>
</tr>
<tr>
<td>ICN</td>
<td>International Council of Nurses</td>
</tr>
<tr>
<td>ICT</td>
<td>Interactive Communication Technology</td>
</tr>
<tr>
<td>MeSH</td>
<td>Medical Subject Heading</td>
</tr>
<tr>
<td>NUPARC</td>
<td>Nutrition and Physical Activity Research Centre</td>
</tr>
<tr>
<td>OF</td>
<td>Optimal functionality (in study II called “functioning as optimally as possible” by the older adults)</td>
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<td>PCC</td>
<td>Person-Centred Care</td>
</tr>
<tr>
<td>SA</td>
<td>Senior athletes</td>
</tr>
<tr>
<td>SLH</td>
<td>Senior living home (older adults in)</td>
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<tr>
<td>SNAC</td>
<td>Swedish National Study on Ageing and Care</td>
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<td>WHO</td>
<td>World Health Organization</td>
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Introduction

Worldwide there are 125 million older adults over the age of 80. It is estimated that by 2020 older adults over 60 will outnumber children under the age of five, and the number of older adults is expected to increase from 900 million in 2015 to two billion in 2050. In Sweden there are currently 2.4 million older adults. Longer life expectancies can lead to an increase in possibilities for older adults, but barriers can ensue if the later years are characterized by ill health and/or limited functional ability. Aging is individual, it has varying factors that play a part and changes with age vary, yielding a heterogeneous older adult population. This population variation among older adults emphasizes the importance of a person-centred care when care is needed. This is particularly important as more than half of the ageing population is diagnosed with multiple illnesses that entail a major consequence of increased health care utilization. In this thesis, older adults are defined by the WHO definition as those 65 years or older. The mental health of older adults is also a pressing issue that requires attention. In Sweden, approximately 20% of all older adults live with mental health problems.

I began my PhD postgraduate studies in NUPARC, which is a multidisciplinary research and innovation centre focusing on optimal health among older adults. The two main branches of research in NUPARC focus on optimal functionality and gut health. Researchers in NUPARC use the concept “optimal functionality” in their discussions regarding older adults and their optimal health, but when asked what the concept meant no one really had an answer. The concept of optimal functionality is complex and not well defined in health related research. Terms such as function and optimal are however used by agencies and authorities when describing the health of older adults. This knowledge gap inspired my thesis, i.e. to explore and describe what the concept of optimal functionality really means from the older adult’s perspective and to develop a personalized ICT-platform with the future aim to measure optimal functionality. I am thus thankful for having been introduced to the concept of optimal functionality and the opportunity to explore it further.
Background

Optimal Functionality

The sole word of “functionality” is described as the ability of a product to carry out the functions it is constructed for. For medical contexts functionality is explained as the special, normal, or proper action of any part or organ. However, the term functioning is described by WHO as an overall term for body functions, body structures, activities and participation; it represents the positive aspects of the interaction between an individual with a health condition and his/her environmental and personal factors. The terminology “optimal health” is used by authorities and researchers as well. The Public Health Agency of Sweden use it when describing healthy ageing as optimizing the process of physical, social and psychological health. In the review by Franco the term is used when discussing the importance of understanding mechanisms that enable individuals to maintain optimal health.

When conducting the search in three different databases for “optimal functionality” as a connected term the search results showed that it is used in several domains, however none in the field of geriatric health care. In PubMed 48 titles were retrieved. Some of the articles dealt with plant organs and their cell growth. Optimal functionality was also mentioned in articles regarding a disease specific measurement instrument, management of chronic pain and vitamin-D supplements in order to function optimally. The concept was also used in articles when discussing optimal functionality of surgical tools, optimal functionality in dental care, optimal functionality in genetics and cellular therapy in cancer treatment. In Cinahl only five titles were retrieved all of which were duplicates that could also be found among the 48 articles in PubMed. When conducting the search in PsycInfo, three articles were found, of which one was a duplicate from PubMed. The remaining two articles were about environmental toxins in obesity and health maintenance measures for the elderly.

In summary, there is little knowledge regarding the concept of optimal functionality in the area of health care and none for the older adult population. The terms “optimal” and “functioning/functionality” are used separately in research and by authorities but not together as a concept.
The knowledge gap in existing research also extends to what the concept means to the older adults.

**Older adults**

It is a well-known fact that life expectancy is increasing worldwide due to the decrease in the mortality rate and for the first time ever it is possible for most adults to experience their 60th birthday and live long beyond that in high-income countries. The reason for the longer life expectancies may be a mix of improved health care and better public-health initiatives. This enables opportunities without precedent for the older adults, their families and the societies they live in. Due to this development there is considerable international and national research regarding older adults’ health and the process of healthy ageing. The WHO published a report on health and ageing discussing the increased life expectancy worldwide and how to manage the upcoming challenges with an ageing population. In addition, the European Commission published a report on multimorbidity and there is also an on-going project (European Innovation Partnership on Active and Healthy Ageing) in collaboration with several EU countries, which aims to increase the average healthy lifespan of older adults with two years by the year 2020. The large EU Healthy Ageing Project 2004-2007 was co-founded by the European Commission that involved ten countries, The European Older People’s Platform (AGE) and the EuroHealthNet as a step towards health ageing. AGE focuses on a wide range of policy areas that impact on older adults and includes e.g. social inclusion, health research, and new technologies. EuroHealthNet has e.g. focused on ICT solutions. Additionally, there are several large research projects and research centres on a more national level as well. The Aging Research Centre (ARC) at Karolinska Institutet and Stockholm University have investigated many areas regarding older adults and the ageing population that include; longevity, morbidity and functioning, treatment and care of elderly persons, health trends and inequality, and brain aging. The Centre for Aging and Health (AgeCAP) at the University of Gothenburg is a multidisciplinary research centre that has the goal to increase the possibility for good and valuable ageing by enabling the capability of older adults. Capability is defined as the individuals ability to perform actions in order to reach the goals he or she has
reason to value 43. The Swedish National Study on Aging and Care (SNAC) is a large national project involving several counties, focusing on the living situations and health statuses of older adults in Sweden 44. Further, population studies regarding older adults are conducted on different age-groups and cohorts: e.g. +70 years, +85 years and + 95 years 44,45 indicating that the ageing population is a group with diversity 4 where health and functional state is impacted on by aging that has varying factors playing a part and changes that vary for each individual 3.

In summary the aging process has been studied in many different ways and in relation to concepts such as capability in old age. Whether older adults’ increased longevity will be a resource to the society or a detriment is dependent upon their health status. However, despite all the on-going research there is a clear lack in research regarding the concept of optimal functionality and what it means to older adults.

**Health among older adults**

Living an optimal life in old age is dependent upon the older adult’s present state of health and well-being. However, it is a known fact that old age brings with it functional limitations 46, health problems like anxiety and pain 47, greater risk of heart disease, stroke, cancer and chronic lung disease 48 as well as multimorbidity 5. Older adults can also experience good health, which enables them to have a long and productive work life 10. The population of older adults is a heterogeneous group and they will experience their state of health in different ways.

Looking at health as a concept, it has several meanings derived from different theoretical and philosophical perspectives. The definition of health given by the WHO, which originates from 1948 declared that “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” 49. The WHO expanded and clarified the definition in 1986 by emphasizing that it is of importance that an individual or a group identifies and understands their preferences in order to satisfy their needs and that health is a resource for everyday life 50.

Health as a theory has been defined in many different disciplines. Biomedical health theories reason that “what threatens health causes disease”. Disease is described as something that affects the human being from
outside and that the individual does not have to take an active part in the treatment. In the bio-statistical theory, health has been described in this way: “a pathological condition is a state of statistically species-subnormal biological part-functional ability, relative to sex and age. The total absence of pathological conditions, is then a value-free scientific notion.” According to Boorse, health is present only when disease is absent, but from the humanist perspective health is defined as a process that the human being experiences in daily life and the individual is viewed holistically.

Nordenfelt declares overall health as a relationship between an individual's ability, their vital goals and the given circumstances. Health is something that cannot be approached in an objective matter, but it is highly subjective and pertains to the whole person. Moreover, Nordenfelt proclaims that health is not about single organs being healthy or not, but about the human being as a whole. However, experiencing health in old age is a major research area with healthy ageing as a leading concept. Healthy ageing is described as the process of developing and maintaining the functional ability that enables well-being in old age. A major part of the research focuses on better understanding of the trajectories to healthy ageing and its maintenance. Additionally, Berg, Sarvimäki and Hedelin state that older adults see health as 1) being able to be the person that they are, 2) being able to do what they want to do, and 3) being able to feel well and have strength. These all have the core element of ability, but also they indirectly integrate Nordenfelt’s two other factors of vital goals and circumstances.

Experiencing health and self-perceived health are closely related in the sense that they have a subjective approach to the meaning of health, which is not something that is given or decided by someone else, but something only the individual can experience. Research indicates that health can be experienced despite health conditions. Idler similarly pointed out that having a positive attitude to life and health facilitates the acceptance of an illness and helps the individual to view their illness as a part of their health.

In summary, research indicates that old age will be characterized not only by the experience of good health but also ill health. In this thesis health is defined based on Nordenfelt’s holistic approach. It is further seen as a state of mind that is experienced only by the individual and is achiev-
able despite health issues, decreased body function and high age. On the basis of the reasoning above, health is something personal that can be perceived only by the individual himself. In the same context it is essential to discuss the mental aspects of health and in particular among older adults, as they tend to be at increased risk for mental health issues.

**Mental Health among older adults**

Mental well-being, in addition to physical and social well-being, is one of the three aspects WHO uses to define health. WHO clarifies it by describing mental health as follows: “Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community.” Mental illness is a combination of biological and psychological factors together with certain external events and is also associated with feelings of shame and guilt.

Approximately 10-15% of older adults over the age of 65 are estimated to have depression of which 5% have a severe form. Generalized Anxiety Disorder is the second most common mental illness among older adults with 3-5% and approximately 2% have psychotic illnesses. According to the National Board of Health and Welfare ageing increases the risk for mental illness due to social, psychological and biological factors. The older adults may have depression and anxiety due to the loss of their social role or the loss of their spouse. The same report indicates that anxiety and sleep disorders can be considered normal, but are an indication of mental strain. Loneliness and economy are significant factors related to mental health among older adults. There is evidence that an increased pension income improves mental health status. Internet Communication Technology tools can also enhance mental health and well-being. However, negative neighbourhood perceptions are associated with a poorer state of well-being among older adults.

It is important to note that older adults accounted for the lowest rate of psychiatric diagnoses among adults in a Swedish report and those older adults with mental health issues in society are sometimes an invisible group as they do not always seek help when needed. There are multiple barriers for seeking treatment such as, an older adult thinking they should not need help, thinking treatment will not help, not wanting to talk with a
stranger about private matters, cost, not knowing where to go and distance. This alludes to the probability that there are many older adults living with mental illness that are not seeking help.

In summary, mental health in this thesis is based on the WHO definition, as a state of mind that is more than just the absence of mental disease or illness. However, older adults do not always seek help when they need to due to several barriers, which can make the older population an invisible group. ICT-tools can be a possible way to enhance mental well-being in this group.

**Internet Communication Technology among older adults**

According to the European Commission, ICT can help solve many of society’s issues such as meeting the growing need for a durable and stable health care system and helping older adults to age well. ICT-tools have the potential to help older adults towards healthy ageing.

The driving forces behind older adults’ desire to learn how to use ICT-tools are those that enhance quality of life, such as maintaining contact with friends and family, and pursuing passions and interests. A barrier on the other hand is fear of using a computer. Adopting modern technology is still limited among older adults and therefore it is important that ICT-tools should be simple, easy to use and also present very clear benefits.

Some studies also show how crucial it is that ICT-tools address specific personal and cultural characteristics, be personalized and taught one to one.

Positive attitudes towards the use of ICT are of importance because of the increasing technology in society and different services connected to it such as health care. A study indicated that older adults have a more positive attitude towards the use of computers and learning ICT already after the first few moments with a computer.

The attitude of the older adults is therefore important when developing ICT-tools. This suggests that it is important to involve the older adults when developing ICT-tools for the ageing population. According to Lindsay it is a challenging task to involve older adults in what they call participatory design, but it is always fruitful and it can improve design quality because it gives insight into the lives of the older adults. Additionally, older adults engage in and use modern technologies if the technologies are
beneficial to them \(^{28}\) and ICT-tools are considered to benefit older adults by helping them monitor their health, maintain social networks and volunteer in organizations \(^{29}\).

In summary, ICT-tools enhance health care communication and improve health and well-being among older adults as well as helping them towards more independent and healthy lives. Developing ICT-tools should involve older adults themselves as this enables the opportunity to learn from the older adults about their lives. There are possibilities to develop interactive ICT-tools for older adults where they can chart their preferences and steer towards what they consider important.

**Person-Centred Care**

The ageing population is a diverse group where the health status and multimorbidity of an older adult cannot merely be determined by age \(^{3,4}\). This diversity is why a PCC approach is essential for older adults when they seek care \(^{10}\). The National Board of Health and Welfare has recently published a report on a needs oriented and systematic approach that identifies and describes the needs of older adults requiring health care assistance. The uniqueness of this approach is that it is the specific needs and requirements of the individual that decides what kind of help or assistance the healthcare team will provide \(^{81}\).

PCC is a holistic approach in the health care context. It is an approach comprising respect toward the individual, it allows negotiation and it is based on the patient’s personal preferences. The patient is empowered to take part in health care decisions at all levels as they desire \(^{82}\). According to the National Board of Health and Welfare it is the individual’s personal perception of his/her resources and restraints that should be identified in order for the older adult to receive proper help and assistance \(^{81}\). The Swedish Society of Nursing (2010) has established that PCC is a good concept and care model that has been shown to be effective in areas regarding well-being \(^{83}\). It is essential to turn to the individuals themselves with the PCC approach as a base and capture a picture of the individual as a whole, one with a history, a family and individual strengths as well as weaknesses \(^{84}\).

In a review study that included qualitative studies, the concept of person-centred participation according to patients in a health care context,
found that the human connection is a fundamental aspect when it comes to person centeredness. Respect and equality were aspects of equal importance according to patients. The older adults seeking care should be met with a PCC approach, and since healthcare professionals are bound by law to offer personalized care and in collaboration with the patient PCC becomes obligatory.

In summary, due to the diversity of the older adult population, members in this group can benefit from the PCC approach because it focuses on personal health status and preferences. A PCC approach can also enable the older adults to become aware of factors that help them experience a good life.
Rationale

After reviewing the literature it is obvious that there is a clear knowledge gap regarding the concept of optimal functionality in the older adult population and what it means to them. The two terms of the concept are used separately in research as well as by the authorities, whereas the concept of optimal functionality is used e.g. in the field of medicine. Due to the changing older adult population, there is much research being done regarding older adults, their health, and healthy ageing. However, there seems to be a shortcoming in the research describing optimal functionality and the importance of it. The older adult population is very diverse; the experience of old age will vary among them and their view of optimal functionality will differ. In Sweden older adults are protected by laws governing their rights to a meaningful and healthy old age, and they will need assistance on their path to health. One possible way is to reach a consensus regarding the concept of optimal functionality, which is believed to be contributory on the pathway to health. Health is subjective and can only be experienced by the individual himself. Experiencing good health will bring possibilities whereas experiencing ill health can bring obstacles. Health cannot be assumed merely by a person’s age, but with advanced years the risk for physical and mental issues increase. The use of ICT-tools by the older adult population can contribute to their experience of ageing well. When an older adult from this diverse population requires care, a PCC approach that focuses on the person and their preferences will not only be necessary but obligatory.

Therefore, a consensus regarding the concept and the importance of optimal functionality and its implementation in an ICT-platform would seem to contribute to the possibility of the older adults attaining good health.
Aims

The overall aim of this thesis was to explore the concept of optimal functionality among older adults and the possibility of creating and developing an ICT-platform to measure it.

The specific aims for the four studies were:

I. To identify the core of the concept of optimal functionality in old age

II. To extend the qualitative knowledge of the concept of optimal functionality by focus group discussions performed in various groups of older adults

III. To describe the experience of mental health and its impact on the ability to function as optimally as possible among older adults with mental health issues

IV. To develop an interactive ICT-platform integrated in a tablet for collecting and managing patient reported concerns of older adults in home care and to test the feasibility and acceptability of the platform
Methods

Design

This thesis focuses on exploring the concept of optimal functionality with an explorative design in study I and study IV, and with descriptive designs in studies II and III. Studies I-III focused on exploring the origins and evolution of the concept of optimal functionality. Study IV focused on the development of an ICT-platform for older adults and in the longer perspective an ICT-platform for mapping OF. Study design, participants, data collection methods and data analysis methods for each study are presented in Table 1.

Table 1. Overview of the design, participants, data collection and data analysis of the included studies I-IV

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Participants</th>
<th>Data Collection</th>
<th>Data Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Explorative</td>
<td>15 older adults</td>
<td>Focus group discussions</td>
<td>Qualitative content analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Literature</td>
<td>Scoping study approach</td>
</tr>
<tr>
<td>II</td>
<td>Descriptive</td>
<td>37 older adults (SA, FL, SLH)</td>
<td>6 focus group discussions</td>
<td>Qualitative deductive content analysis</td>
</tr>
<tr>
<td>III</td>
<td>Descriptive</td>
<td>6 older adults</td>
<td>6 individual interviews</td>
<td>Phenomenological analysis</td>
</tr>
<tr>
<td>IV</td>
<td>Explorative/Feasibility study</td>
<td>8 older adults and 3 nurses</td>
<td>Literature</td>
<td>Logged data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Individual interviews</td>
<td>Qualitative inductive content analysis</td>
</tr>
</tbody>
</table>
Study participants and selection process

Study cohort

A study cohort belonging to NUPARC was used for studies I-III and in some parts of study IV. The cohort was comprised of 317 older adults in different categories:

- Senior athletes (SA) - older adults engaging actively in orienteering
- Free living older adults (FL) - older adults in ordinary housing not needing assistance from health care or meals on wheels
- Older adults in senior living homes (SLH) - older adults residing in special accommodations, such as senior living homes and in need of assistance and care in their daily lives.

All of the older adults were retired and living in Örebro County, Sweden. Of the 317 study participants, 208 were female and 109 were male with ages ranging from 65 to 93 years. See table 2 for an overview.

In the selection process of study I, contact was made with the older adults in two senior living homes that had given their informed consent to provide the information necessary to form the study cohort. From these, fifteen agreed to take part in study I and were invited to take part in focus groups discussions to identify the search term for the scooping review. There were twelve female and three male participants.

In study II 30 SA attended an information meeting at the university regarding the study and 14 consented to participate. There were seven females and seven males between the ages of 67-83 with a Health Index score of 31.5 (22-36). Every 5th FL older adult registered in the database received an information letter regarding the study, and from these, eleven
gave their informed consent to participate. They had ages ranging between 67-87 years, five were female and six were male, with a Health Index score of 29 (21-34). An information meeting was held for the 30 older adults living in one of the senior living homes. From these, 12 older adults gave their informed consent to participate, all were female with ages ranging between 75 and 92 years and a Health Index score of 28 (22-36).

The selection process for study III began as a result of a follow-up study in a larger project. A total of 100 older adults from the existing cohort of FL older adults, had been included in a follow up study, and were asked to submit self-completing questionnaires regarding their health. Among the questionnaires was the self-completing Hospital Anxiety and Depression scale (HADS), and the score results of the self-completing questionnaire were used as the basis for inclusion in study III. HADS measures mental health and is divided into two subscales, measuring depression and anxiety. The questionnaire consists of 14 questions, seven questions per subscale. The scores range from 0-21 with low scores being favourable (73). Out of the 100 questionnaires, 70 completed questionnaires were returned and the older adults who had rated themselves as ≥8 (n=7) where invited to participate in study III. Of the seven study participants, one dropped out leaving six remaining older adults in the study. All six study participants were females over the age of 65. None of the study participants had ever had any contact with psychiatric care.

Study IV included older adults (n=8) that had different assistance and health care needs, different ages, from both genders and with different health statuses. Also included were registered nurses (n=3). From district one, 20 older adults were consecutively contacted of which five agreed to participate. Due to this low number of older adults expressing interest it was necessary to recruit from NUPARC’s existing cohort, see table 2. From the cohort, ten older adults living in district two were invited to participate and three agreed. See figure 1. The included participants were to evaluate the feasibility and acceptability of the study’s ICT-platform. Inclusion criteria for the study were older adults ≥65 years, registered in the healthcare system, receiving some kind of assistance from nurses and having contact on a regular basis with a nurse. The older adults also needed to be able to read and understand Swedish. Moreover, they should also have the likelihood to use a smart tablet continuously for four weeks. The inclusion process is described in Figure 1. All registered nurses working
in a home care unit in district one were invited to participate in the study, and three female registered nurses consented to participate. Their ages ranged between 35-46 years and they had between 1-15 years of professional experience in geriatric care.

**Data collection**

**Study I**

Since no MeSH-term results for optimal functionality were found, two FGDs were conducted with older adults to obtain a relevant term for the literature search. As a result of the FGDs the term “personal satisfaction” was found to be suitable, and after discussions in the research group, it was subsequently used for framing the concept of optimal functionality in the search process. Arksey and O’Malley’s scoping review approach was adopted when conducting the search. It is an approach that is repetitive in its process and aims to identify, examine, map out and clarify gaps in the research field. In total there are five steps with an optional sixth step to follow:

1. Identify a research question
2. Find relevant studies

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*Figure 1. Overview of the inclusion process in study IV*
3. Select studies to include in the review
4. Extract data from included studies
5. Gather, summarize and report results of the review
6. Consultation (optional)

The electronic databases PubMed and Cinahl were used in the search strategy. The key search term was set to “personal satisfaction” AND (elderly OR older adults OR old age OR old persons) to start scoping the literature. A ten year date limitation range for published articles was set from January 2002 - July 2012 to capture current research and literature. Additionally, newly published articles from 2012 - 2013 were also included to frame new added research in the search.

The only limitation set was that for English language. Inclusion and exclusion criteria were applied to capture the most eligible literature within the scope of the study (Table 3).

| Table 3. Overview of inclusion and exclusion criteria |
|-----------------------------------------------|----------------|
| Inclusion criteria                             | Exclusion criteria |
| Peer-reviewed                                  | Commentaries     |
| Full-text articles                             | Letter           |
| Report in English                              | Editorials       |
| Articles including older adults ≥65 years      | Only abstracts   |
| Articles conducted in Western countries (including Australia and New Zealand) | Intervention studies |

Study II

Kitzinger’s procedure for conducting FGDs was used. A total of six FGDs from the three groups of older adults (See table 2) were conducted for study II. The formation of the six FGDs was accomplished by dividing the older adults from each group into two separate groups. The six focus group discussions consisted of 5-8 participants and lasted 45-90 minutes. FGDs with the SA and the FL older adults were held at the university, and were led by two doctoral students involved in the project. For logistic reasons, the FGDs with the older adults in SLH were conducted at the senior living homes where the older adults resided. FGDs with older adults in SLH were, for the most part, led by the supervisors with full involvement of the co-authors. Prior to each FGD, the two first authors provided information regarding the aim of the study; and the safe, confidential, and anonymous storage of the collected data.
A semi-structured interview guide was constructed by using the three cornerstones of optimal functionality; Body-related, Self-related and External factors, as the framework. By choosing an interview guide that was unstructured, the possibility for more free uncontrolled discussions could be achieved. The semi-structured interview guide comprised four questions; one general question and three more specific questions.

1. What in general causes you to experience OF?
2. What Body-related factors lead you to experience OF?
3. What Self-related factors lead you to experience OF?
4. What External factors lead you to experience OF?

During the discussions, follow-up questions were asked such as: “Can you clarify what you mean by that” or “Can you elaborate on that please”. All FGDs were transcribed verbatim by an experienced authorized secretary.

Study III
The participants were contacted by telephone prior to the individual interviews to set up a date. The participants could choose the location of the interview; five chose to come to the university, and one participant wanted to be interviewed at home. The interviews conducted in study III contained one open question, which was “Describe a situation where your mental health has an impact on your experience of functioning as optimally as possible”. The question was not perceived as difficult to understand and the study participants found it to be a broad enough question that gave them the possibility to expound on. The six audio recorded interviews lasted between 45-90 minutes. An authorized secretary transcribed all six interviews verbatim.

Study IV
The data collection in study IV was carried out in several steps. Step one consisted of the developmental process of the ICT-platform. Step two was to test the application implemented in a smart tablet among a group of older adults and step three was to interview the older adults to ascertain if they had succeeded and what their experiences were while using it. Nurses were also interviewed regarding their experiences.
Step 1

**Developing the ICT-platform**

In order to retrieve and manage subjective health concerns in a smart tablet, an interactive application was developed in cooperation with the healthcare management company Health Navigator. The company developed a platform with the following attributes:

- An application that appraises health and well-being assessed by older adults themselves with immediate transmission of the assessment to the responsible nurses.
- Interactive and compatible with a smart tablet.
- A web interface containing a risk assessment model that includes incidence and regularity of health related issues. Any health related issues of concern from the assessment made by the older adults would be sent as alerts to the responsible nurses by SMS.
- Access to self-care advice and links to websites for further information.
- Creation of graphs over the older adults’ previous health and well-being assessments.
- The possibility for older adults and their nurses to view the graphs showing the older adults assessments.

Included in the content of the platform application were areas regarding different health issues relevant to older adults. All areas in the application were based on a review of the current and existing literature and interviews with older adults, healthcare professionals and experts working in or researching geriatric care. Based on the retrieved literature results and the interviews; the questions in the implemented questionnaire covered:

- Fever
- Dizziness
- Eating (difficulties and loss of appetite)
- Bowel function (obstipation and diarrhoea)
- Pain
- Fatigue
- Sleep (insomnia)
- Depression
- Worries
• Distress
• Daily activities (difficulties performing daily activities inside or outside the home and social activities together with others)

All questions in the questionnaire asked the older adults to specify incidence, regularity and level of distress. The application also included self-care advice, links to proposed evidence-based webpages and a graph showing assessments over time. A risk assessment model based on the reported incidence and regularity related to the questions was also incorporated into the application. Depending on the severity of the assessment from the older adults, the responsible nurses could receive a red or yellow SMS alert to their work mobile phones. The red alert would be of a more critical nature meaning that the older adults perceived their health issue as more acute and wished to be contacted by a nurse within a few hours. The yellow alert would indicate that the assessed health issue was not critical but serious enough and that the nurse should contact the older adult within 24 hours.

Step 2

Testing the application

All study participants received a smart tablet (Nexus Google) with the implemented application installed. The eight older adults were verbally informed and instructed on how to use the tablet i.e. answering the questions in the application, using the self-care advice if needed and viewing their assessments on the graph. The older adults were given written instructions and were informed to use the tablet and complete the health and well-being assessments three times per week or more as needed. They were informed that if they missed a day, a reminder message would appear on the tablet. The three registered nurses participating in the study were given instructions and guidelines, which also included information regarding the management of the alerts and the data received from the older adults’ assessments. The nurses in charge were given a study specific mobile phone and were able to log in to the study specific web-interface where they could view all assessments and take further measures regarding the alerts and the data received. All the logged data from the assessments were stored in a secure server kept at the company.
Step 3

Interviews
The eight older adults participating in the study were interviewed individually regarding their experiences using the tablet and the application. All interviews were conducted at the older adults’ residences due to logistic and mobility issues. Each individual interview was audiotaped, transcribed and lasted between 15-30 minutes. The semi-structured interview guide had one opening question and one question that focused on the self-care advice, which were:

1. Tell me about your experiences of reporting your health status using the tablet?
2. What did you think about the self-care advice?

A follow-up question such as “Could you describe or give an example” was used when the older adults needed to elaborate or be more specific.

Individual interviews were conducted with the registered nurses regarding their experiences of using the platform and handling the alerts that were sent to them. The three audiotaped, transcribed interviews were conducted at the registered nurses’ offices and lasted between 15-20 minutes. The RNs were asked the following four questions, and if needed to elaborate or specify their answers:

1. How have you experienced working with the system from a technical standpoint?
2. How has it been working with the alarms?
3. How many times weekly should the older adults assess their health status?
4. What do you think about the quality of the questions in the applications?

Data analysis

Study 1
The two FGDs were analysed by qualitative content analysis and generated the search term “personal satisfaction”.

The analysis of the retrieved articles using Arksey and O’Malley’s framework was initiated by designing a matrix comprising first author, country, publication year, current impact factor, methodology (quantita-
tive or qualitative), sample size, age of study population and themes that could be identified. After that, the authors, aim, methods and findings were taken out and placed on a second matrix. Once this was accomplished the analysis continued by charting and collating the data, then summarizing and reporting the results. The step-by-step procedure went as follows:

1. Factors connected to the search term “personal satisfaction” were found and extracted from the result section of all the included articles. All factors were either positively or negatively linked to the term “personal satisfaction”.
2. All identified factors were found to belong to the following nine aspects: mental, activity, autonomy, capability, social adjustment, demographic, health and environmental.
3. All co-authors met to assess and evaluate the findings and to create an overview of the nine aspects. After considerable discussion, the nine aspects were distributed into three major themes, namely: Body-related factors, Self-related factors and External factors. An overview of the grouping of the aspects under the themes is presented in Table 4.

<table>
<thead>
<tr>
<th>Body-related factors</th>
<th>Self-related factors</th>
<th>External factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomy aspects</td>
<td>Mental aspects</td>
<td>Demographic aspects</td>
</tr>
<tr>
<td>Health aspects</td>
<td>Capability aspects</td>
<td>Environmental aspects</td>
</tr>
<tr>
<td>Activity aspects</td>
<td>Adjustment aspects</td>
<td>Social aspects</td>
</tr>
</tbody>
</table>

Study II

Study II was analysed using deductive content analysis. Elo and Kyngäs’ approach for a deductive content analysis was adopted to analyse the transcribed discussions. This approach is often used when researchers want to confirm previously obtained data from different settings and with previous studies such as literature reviews. Co-assessment and peer scrutiny occurred during the entire analysis process, which followed these steps:

1. The transcribed discussions were read thoroughly to obtain an overview of the entire data.
2. Subsequently, a structured analysis matrix was designed. In this phase of the analysis process new subcategories (from the former main categories) were selected from the transcribed text-documents.

3. The structure of optimal functionality was used as a model for testing and retesting the coded categories.

Study III
In study III, the transcribed interviews were analysed with a phenomenological approach inspired by Giorgi 90. Prior to analysing the data it is essential to be aware of one’s preunderstanding, and because of this the researchers bracketed their natural attitudes and adopted a more scientific attitude in order to evade any interpretations narrated by the study participants and to convey the life world as it appears to them 93.

The entire process of analysis followed the four steps outlined by Giorgi 90, 94. After the verbal data was collected through individual interviews, all transcribed interview text was read through to get a sense of the whole. In the second step, the data was broken into meaning units relevant to the phenomenon being studied. Thirdly, the meaning units were organized, reworded and rewritten into transformed meaning units in the disciplinary language of choice. Then organized transformed meaning units revealed patterns and variations. In the fourth and last step the meaning units were synthesized into a structured synthesis 90.

Study IV
The company that designed the platform for the implemented application compiled all the logged data from the older adults’ reports.

All interviews were analysed with inductive qualitative content analysis by Elo and Kyngäs 91. All transcribed data was read through several times to get a sense of the whole. Subsequently, the organising phase of the analysis was initiated, and comprised these steps:

1. Open coding- at the same time the text is read, sentences or phrases that were perceived as important or meaningful were noted by writing in the margins of the text.

2. Coding sheets- based on the margin notes suitable headings were written on a coding sheet.
3. Grouping- all the codes that had events in common were grouped together and formed sub-categories.
4. Categorisation- similar messages and meanings in the subcategories were then grouped as main categories.
5. Abstraction- a general description of the research topic is created through the completion of all of the above steps.
Ethical statement

The Uppsala Regional Ethics Review Board approved study I, II, III (dnr. 2012/309) and IV (dnr. 2012/357). All research carried out for this thesis has been in compliance with guidelines of the International Council of Nurses (ICN)’s ethical code for nurses as well as The Declaration of Helsinki. ICN’s ethical code for nurses addresses among other things, the respect for autonomy and the principles of equality and confidentiality. The Declaration of Helsinki provides principles regulating human clinical research. The studies involved in this thesis have complied as follows:

- All study participants involved in studies I-IV received information, both orally and written.
- All participants in all studies were legally competent and gave written informed consent before participating in the studies.
- Participation was voluntary. All study participants were informed about the right to drop out at any time without having to give a reason and that confidentiality and anonymity was guaranteed.
- Confidentiality could be guaranteed since data could not be traced to any individual included in the studies.
- In all studies, the qualitative interviews were tape-recorded, transcribed verbatim and coded making the interviews unidentifiable. All data that was audio recorded and transcribed were kept in a locked safe that only the researchers had access to.
Findings

Study I - The origins of optimal functionality

The findings from study I revealed three major themes, accompanied by their nine aspects, three for each theme:

1) Body-related factors: health, autonomy and activity aspects
2) Self-related factors: capability, adjustment and mental aspects
3) External factors: demographic, social and environmental aspects

Additionally, each aspect had factors that could be considered to either facilitate or impede OF. See table 5 for an overview of the factors belonging to the specific aspects.
Table 5. Overview of the factors in each aspect

<table>
<thead>
<tr>
<th>Body-related factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health aspects</td>
</tr>
<tr>
<td>Comorbidity</td>
</tr>
<tr>
<td>Gastrointestinal disturbances</td>
</tr>
<tr>
<td>Without fractures</td>
</tr>
<tr>
<td>Subjective health</td>
</tr>
<tr>
<td>Poor health</td>
</tr>
<tr>
<td>Exhaustion</td>
</tr>
<tr>
<td>Medications</td>
</tr>
<tr>
<td>Musculoskeletal complaints</td>
</tr>
<tr>
<td>Autonomy aspects</td>
</tr>
<tr>
<td>Independent function</td>
</tr>
<tr>
<td>Poor function</td>
</tr>
<tr>
<td>Reduced self-care capacity</td>
</tr>
<tr>
<td>Self-care capacity</td>
</tr>
<tr>
<td>Dignity</td>
</tr>
<tr>
<td>Activity aspects</td>
</tr>
<tr>
<td>Physical condition</td>
</tr>
<tr>
<td>Physical activity</td>
</tr>
<tr>
<td>Self-related factors</td>
</tr>
<tr>
<td>Capability aspects</td>
</tr>
<tr>
<td>Inner resources</td>
</tr>
<tr>
<td>Coping skills</td>
</tr>
<tr>
<td>Religious/spiritual</td>
</tr>
<tr>
<td>Adjustment aspects</td>
</tr>
<tr>
<td>Uplift/enjoying small things</td>
</tr>
<tr>
<td>Active adjustment</td>
</tr>
<tr>
<td>Mental aspects</td>
</tr>
<tr>
<td>Lower depression</td>
</tr>
<tr>
<td>Poor psychological function</td>
</tr>
<tr>
<td>Tension</td>
</tr>
<tr>
<td>Emotional difficulties</td>
</tr>
<tr>
<td>Psychological well-being</td>
</tr>
<tr>
<td>Neurotic</td>
</tr>
<tr>
<td>Depressed</td>
</tr>
<tr>
<td>Lower depression</td>
</tr>
<tr>
<td>Cognitive functioning</td>
</tr>
<tr>
<td>Extraversions</td>
</tr>
<tr>
<td>Lower neuroticism</td>
</tr>
<tr>
<td>Lower worry</td>
</tr>
<tr>
<td>Worry</td>
</tr>
<tr>
<td>External factors</td>
</tr>
<tr>
<td>Environmental aspects</td>
</tr>
<tr>
<td>Environment</td>
</tr>
<tr>
<td>Ordinary housing</td>
</tr>
<tr>
<td>Social aspects</td>
</tr>
<tr>
<td>General activity</td>
</tr>
<tr>
<td>Social network</td>
</tr>
<tr>
<td>Married/partner</td>
</tr>
<tr>
<td>Still being important to others</td>
</tr>
<tr>
<td>Socially active/participating activities</td>
</tr>
<tr>
<td>Poor social network</td>
</tr>
<tr>
<td>Widowed</td>
</tr>
<tr>
<td>Loneliness</td>
</tr>
<tr>
<td>Demographic aspects</td>
</tr>
<tr>
<td>Male sex</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Economy</td>
</tr>
<tr>
<td>Lower age</td>
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<tr>
<td>Higher age</td>
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</tbody>
</table>

SAMAI ALGILANI “To be at one’s best”
In addition to the three major themes with the nine aspects and accompanying factors, the findings revealed that nine of the included articles presented factors that were related to all three themes whereas four articles presented factors related only to External factors. A total of two of the 25 articles presented factors pertaining to Body-related factors and one article was found to present factors only pertaining to Self-related factors. Moreover, it was found that factors pertaining to External factors had been quoted 46 times in the result section of the included articles, whereas factors pertaining to Self-related and Body-related factors were quoted 33 and 35 times respectively in the result section of the included articles. Furthermore, one major finding in study I was that the majority of included articles were of a quantitative nature, more precisely, out of 25 included articles 19 had a quantitative approach. With only six qualitative articles included in study I, a research gap appeared, and signalled the need for interviews with older adults regarding their perception of what comprises optimal functionality.

**Study II - the core of optimal functionality or in other words functioning as optimally as possible**

The findings of study II revealed:

- The core meaning of optimal functionality according to older adults is “to function as optimally as you possibly can” or more specifically, to be at one’s present best.
- According to older adults the three cornerstones of optimal functionality that consisted of Body-related factors, Self-related factors and External factor are bound together and each and every one of the cornerstones is essential for the experience of well-being.
- OF was described as a concept with many layers and different meanings.

The analysis of the FGDs gave rise to several new factors, related to all three cornerstones, which can be added to the structure of the concept of optimal functionality. Newly added factors are presented in italics below.
Body-related factors
The only factor that all three groups of older adults discussed during the FGDs was the importance of healthy food. Being able to eat healthy and nutritious food was perceived as something positively important for optimal functionality. Going for annual health check-ups and experiencing physical exertion were factors important to the SA but not mentioned by any other group. Relaxation, physical function, maintaining your physical ability and occupying your self were other new factors that were brought up and discussed only by the FL older adults. Being free from disease and being able to move were two prerequisite factors that were important to the older adults in SLH. The FL older adults and the older adults in SLH both discussed the factor of gut health and considered good gut health to be a necessity for functioning as optimally as possible. Trying to stay independent and being able to maintain your daily routines were considered by the SA and the FL older adults as important for functioning as optimally as possible in their everyday lives.

Self-related factors
Several factors new to the concept that pertained to the aspect of capability were discussed and reflected upon as being positively related to the experience for functioning as optimally as possible. Factors mentioned were experiencing new things, engaging in activities, experiencing nature and enjoying tasty food. Only the SA talked about living in the present, while the FL older adults reflected upon the acceptance of eventually becoming dependent on others. When discussing factors related to the self, the SA and the FL older adults had several topics in common. The factors of being content with life as it is, enjoying life, having goals and making plans for the future, and having a positive attitude towards others as well as yourself were all necessary for functioning as optimally as possible. Being grateful for life and carrying out acts of kindness were important factors for the FL older adults and the older adults in SLH. The topic of mental aspects was not even slightly touched by the older adults providing us with no new factors related to it.

External factors
Engaging in social activities and thriving at home were newly added factors seen as essential by all groups of older adults in order to function as
optimally as possible. *Silence* however was something only discussed and considered important by the SA. Having access to *assistive tools* was a topic discussed by the older adults in SLH and was considered quite important. The SA and the FL older adults had much in common when they discussed functioning as optimally as possible regarding external factors. The two groups discussed the importance and necessity of a *social network*, having *family and significant others* and *modern technology resources*. Good quality health care was essential for the SA and the older adults in SLH.

**Study III - mental health an integral aspect for functioning as optimally as possible**

The findings revealed a tripartite result describing the meaning of mental health for functioning as optimally as possible, which consisted of three syntheses:

- Life situations affecting mental health
- Consequences of mental health
- Strategies to maintain good mental health

The three syntheses are linked to each other in a cyclic fashion, but do not necessarily follow any specific order, and can make an impact together or separately. The synthesized structure can be seen in Figure 2.

![Figure 2. The structured synthesis](image)

*Figure 2. The structured synthesis*
Life situations affecting mental health

Physical health was described as having an impact on the older adults’ mental health and their ability to function as optimally as possible. Changes in bodily function, sleep deprivation, gastrointestinal issues, impaired vision, balance problems, headache, migraine and anosmia were physical concerns expressed by the older adults. Furthermore, concerns over the health of family members, their own health and fears of becoming ill were all life situations that played a significant role in their mental health, and subsequently their ability to function as optimally as possible. Concern for family members after one’s own death and bereavement in the family were predictors of poor mental health affecting the ability to function as optimally as possible.

Long distances to family and friends was described as an obstacle for good mental health as was a poor relationship with one’s spouse. The older adults described that their mental health was affected when they felt they had not raised their children properly or that their own upbringing was troubled. Encouragement, support and spending time with family were all described as having an impact on mental health and the ability to function as optimally as possible.

Social aspects, such as living in a small town and being close to events and activities were found to have an impact on mental health as was not having enough social interaction.

External factors that produced stress such as traffic situations, not knowing how to use a computer and the rapid development of modern technology impacted the older adults’ mental health, which in turn affected their ability to function as optimally as possible. The fear of becoming dependent upon others had an impact on their mental health and ability to function as optimally as possible. Health care experiences, both good and bad were said to affect the older adults’ mental health. Season and weather was also something that affected the older adults’ mental health, as was the time of day. Older adults could feel insecure at night, which in turn affected their ability to function as optimally as possible.

Consequences of mental health

The older adults described that the consequences of mental health could affect their ability to function as optimally as possible in many ways. Psychotropic pharmaceuticals were considered helpful and were expected to
improve one’s mental health, which had an effect on their mental health and the ability to function as optimally as possible. Sleep deprivation, worrying about the health of family members, pondering in general and existential thoughts that led to anxiety and sadness were all consequences that impacted on the older adults’ mental health, and impacted their ability to function as optimally as possible. Stress in everyday life was found to be a consequence that had many effects e.g. distress, deteriorated physical condition and worsened joint problems, which affected mental health and in turn affected the older adults’ ability to function as optimally as possible. Anger and loneliness were consequences that could have an impact on the older adults’ mental health and subsequently their ability to function as optimally as possible.

Strategies to maintain good mental health
The older adults described what strategies made them feel better and thus maintain good mental health.

Both diversion and asking for help were strategies used to maintain good mental health, which in turn affected their ability to function as optimally as possible. Taking the initiative to do things or keeping a pet were also strategies that contributed to the maintenance of good mental health. Having “me-time” was experienced as an important strategy to feel better mentally, as was taking interest in something, e.g. genealogy. Other strategies important for maintaining good mental health among the older adults was earning their own money (gave rise to a sense of freedom), being determined (not giving up and being more optimistic) and feeling content (with what you have), all of which in turn affected their ability to function as optimally as possible. Lastly, setbacks and adversities in life were discussed both as something that makes one stronger but, also as something that could lead to mental illness. Either way, it affected their ability to function as optimally as possible.

Study IV - the feasibility of an ICT-platform – the possibility of measuring functioning as optimally as possible
The result section of study IV, pertains mainly to the experience of the older adults. First the evaluation of the logged data and reports sent by the older adults and second the evaluation of the older adults’ usage of the
tablet and the platform. The registered nurses reflected mostly their advisory role in content, development and usage of the system.

1 - The logged data

During the four weeks that the eight older adults had the tablet, 104 reports were made. The number varied from 10 to 16 reports per older adult yielding a mean of 13 reports. The most frequently reported concerns reported by the older adults were pain and fatigue. Pain had been reported 55 times and fatigue 48 times. Loss of appetite and fever were both only reported once, making them the least frequently reported concerns. See Figure 3 for an overview of the frequency of the concerns reported by the older adults in the study.

![Frequency of Concerns](image)

Figure 3. Overview of the frequency of the reported concerns during the four week time period

During the four weeks of the on-going study a total of 39 alerts were sent out by five of the older adults of which 38 alerts were of a yellow character (not critical) and one alert was red (critical/acute).
2 - The evaluation

Interviews were conducted, both with the older adults who had a tablet and also with the registered nurses in charge of receiving reports and alerts. The aim of the interviews was to determine the acceptability of the tablet with the implemented platform. Through analysis of the interviews two categories were revealed: acceptability of the application and management of concerns and self-care.

Acceptability of the application

The older adults perceived using the application implemented in the tablet as an overall pleasant experience. Feelings of being proud were expressed by the older adults due to the fact that they had managed the device and application independently without needing assistance from others. The eight study participants using the application did not encounter any complex or technical difficulties, except for sometimes forgetting to charge the tablet or problems entering the correct pin-code. The size of the text was however perceived as too small resulting in difficulties seeing and reading the text. The tablet was used for other purposes besides those of the study. A few of the older adults surfed the Internet and found it to be rather enjoyable. The older adults were encouraged to send reports three times a week, but it varied from 1-3 times a week. The questions in the application were deemed as relevant and the older adults thought that the areas of the application covered health issues that they might experience in their everyday life. The older adults did mention one shortcoming in the application, which was that they did not have the possibility to enter free text with the reports sent to the nurse.

The registered nurses perceived the system to be beneficial. The graphs allowed them to have an overview of the older adult’s health status, and the application enhanced communication. However, due to their heavy workloads they did not log in everyday, as they should have.

Management of concerns and self-care

The older adults had access to self-care advice in the application and about 50% found it to be an asset in times of need. The remainder of the older adults had forgotten about the self-care advice because they were so focused on the questions.
Contacting a nurse in the healthcare system was felt to be rather difficult usually, so it was considered very positive when the older adults could contact the study nurse so quickly and easily with their concerns.

**Summarized results from studies I-IV**

With studies I-III, we began the exploration of a concept involving older adults and their subjective views and experiences regarding optimal functionality. In study I, new ground was broken regarding the concept of optimal functionality. The concept could be presented as having the whole person in mind, which strived to cover the subjective preferences of older adults. The scoping review indicated that nine aspects; Mental, Capability, Adjustment, Autonomy, Health, Activity, Social, Demographic, and Environmental were involved in the structure of optimal functionality. These aspects were interpreted and grouped into three major themes: Self-related factors, Body-related factors and External factors. The scoping review also showed that there was a lack of qualitative studies conducted in this area and that further research was needed to describe optimal functionality from the perspective of different groups of older adults. Thus, study I gave the origins to the concept of optimal functionality and was used as a starting point for further exploration. The understanding of the concept was then extended in study II where the older adults described OF to be a matter of functioning as optimally as possible. The evolution of the concept continued with several new factors that could be added to the structure of optimal functionality shown in study I. However, in study II the discussions with the older adults were found to be devoid of the mental aspect. This aspect was addressed in study III and three syntheses were identified: Life situations affecting mental health, Consequences of mental health and Strategies to maintain good mental health. These interact with each other and impact the older adult’s ability to function as optimally as possible.

Studies I-III together presented an overall structure of the concept and demonstrated that it is subjective and presents itself differently depending on the older adult’s preferences and perceptions of what constitutes functioning optimally as possible despite age or health status. Study IV revealed that an ICT-platform is highly feasible in the older adult community and that the implementation of factors identifying functioning as opti-
mally as possible in an interactive technical device is achievable in the near future.
Discussion

Methodological discussion
This thesis has focused on exploring the concept of optimal functionality with studies I-III focusing on exploring and initiating development of the concept, whereas study IV is based on developing an ICT-platform for older adults that can be used to identify the factors for eventual measurement of optimal functionality. The different steps in the methods will be discussed below based on credibility, confirmability, dependability and transferability.

Design and approach
In study I an explorative design was used and in study II-III a descriptive design was used. The design in study IV can be seen as explorative, but it was actually more of a feasibility study and was underpinned by the Medical Research Council’s complex intervention evaluation framework (MRC) 97.

In study I, a qualitative approach was employed for the process of finding suitable terms to begin the scoping review that was conducted as outlined by Arksey and O’Malley 87. This approach is an iterative process that enables the investigation of already existing literature so that fields of study can be mapped and research gaps identified. With this process research gaps were revealed. Another possibility could have been an integrated review method as outlined by Whittemore and Knafl, which has been used in evidence based nursing 98. It is however important to mention that study I was conducted at NUPARC and there the aim was to have an interdisciplinary understanding of optimal functionality. The importance of interdisciplinary research, how it builds bridges and brings different kinds of skills and expertise together has been highlighted 99.

Using a qualitative approach throughout studies II-III can be seen as a shortcoming but as stated by Sandelowskii the quality in qualitative research is not only about procedural aspects but also about the interaction between reader, writer and the text 100. This is in line with Patton’s view of qualitative research and analysis being about transforming data into findings for which there is no recipe, only guidelines 101. In study IV, a mixed-method approach 102 was used combining qualitative interviews with older
adults and registered nurses together with quantitative logged data. A mixed-method approach can strengthen weaknesses encountered when only one approach is used.

**Study participants**

The older adults interviewed in studies I-IV were all aged over 65. The older adults in study I with a mean age of 82.9 years, were all residents in a senior living home and in need of help and assistance, making them a relatively homogeneous group. For credibility it is important to include different genders and ages, yet homogeneity can be of an advantage because diversity among the study participants may affect the discussions negatively. The vast majority of all the study participants in all of the studies were of Swedish origin, with the exception of two study participants that had lived in Sweden for most of their lives making the study participants homogenous in that regard. This is in line with Sargeant’s recommendations regarding participant selection for qualitative studies that propose the study participants should possess the ability to convey facets and views of importance to the phenomenon being studied.

In study II, six FGDs were conducted with different age groups, genders, and backgrounds to make them as heterogeneous as possible, since the aim was to extend the concept of optimal functionality. A total of three groups of older adults participated giving a level of diversity that was believed to increase the credibility of the study. All of the study participants in study III were women aged 65-73 and had scored ≥8 on the HADS questionnaire, making them quite homogeneous and suitable to describe the phenomenon being studied. The procedure, which strengthens the credibility used for the selection process is well explained in study III. The study participants in study IV despite their limited number, had different assistance and health care needs, different ages, different genders and different health statuses, which gave good variation that increased the credibility. However, a limitation can be that only those older adults who had a positive attitude towards modern technology and found it beneficial agreed to participate in the study. It is however reported that it is important that older adults are interested and find it useful when developing technology for their usage.

The number of study participants varied from six older adults in study III to 37 study participants in study II depending on the aim and chosen
data analysis. A total of two FGDs in study I can be seen as an acceptable number for retrieving a suitable search term because it is reported that there are no guidelines as to a sufficient number of focus groups. The purpose of study IV was to investigate and examine the feasibility of a new intervention intended to be used in a larger scale study, which is why eight older adults and three nurses were considered acceptable. The number of study participants that should be included in a qualitative study is widely discussed by many researchers.

**Data collection**

Throughout studies I-IV interviews were the primary method of data collection. In studies I and II FGDs were conducted whereas in studies III and IV individual interviews were carried out. By combining different data collection methods in study I (individual interviews and scoping study approach) and study IV (logged data and individual interviews) the objectives of the studies could be attained. It can be viewed as a limitation that decreases credibility when mixing methods or using one method to progress to the next. However, Sandelowski states that mixing methods can enable the possibility to expand the scope of a study. Nonetheless, credibility becomes a central issue in data collection methods where triangulation, i.e. the use of several data collection methods is a way to gain credibility in a study. Additionally, the possibility of combining different data collection methods is discussed in research and can be used to attain the aim of the studies.

In study I and for two of the FGDs in study II, the moderator was an experienced researcher. However, in study II, four of the groups were led by two novice PhD students, which might have affected the discussions. Carey emphasizes that it is not always good for the researcher to be involved as a moderator. It can however be useful if the researcher is the moderator since he/she will have a sensitivity for the methodological trustworthiness, even if their skills managing a group are not yet perfected. However, according to Sharts-Hopko the moderator needs to be a person who can facilitate discussion and bring people to discuss the topic at hand as well as ask relevant follow-up questions.

FGDs were chosen as data collection methods in studies I and II because they enable interaction between study participants and provide the opportunity to examine what study participants think, how they think and why
they think the way they do. This choice can however be viewed as a limitation since FGDs can be considered as not being able to go deep enough, but as stated by several researchers FGDs are an effective data collection method when the aim is to gain opinions, views, attitudes and beliefs. The group dynamics and interaction that were seen would not have been possible if individual interviews had been chosen as the data collection method. However, one of the risks with FGDs, is that it can silence individual voices. All of the study participants in studies I and II actively participated and even encouraged each other to join in the discussion displaying a group interaction described by Kitzinger that strengthens the credibility.

In study III and IV individual interviews were conducted with the aim to explore views, experiences and individual beliefs on specific subjects in order to reach a deeper understanding. Individual interviews were chosen in study III since mental health was the topic, and interviews, and individual interviews are useful and appropriate when a sensitive subject is under investigation. In study IV individual interviews were chosen due to logistic reasons. FGDs could have been conducted, but may not have generated the same depth in the information as the individual interviews did and it would also have been difficult to gather all of the older adults in one place for a FGD.

Interview setting
In study I and in two of the six groups in study II the FGDs took place at the senior living home where the older adults lived. The remaining four FGDs took place at the university. Factors such as old age and multiple health issues hindered study participants from being present at the university. The fact that the study participants were in the familiar environment of their senior living home and were in a more relaxed setting may have generated better discussions. During the FGDs, to enable an appropriate atmosphere, all study participants were seated so that they could see each other and an effort was made to make the setting as relaxed as possible.

In study III, as per choice of the study participants; five of the six individual interviews were held at the university and one at the participant’s home, and in study IV all interviews were held in the study participants’ homes. The interviews were held in quiet rooms free from distractions.
This conforms to the research suggesting that the location of individual interviews should be comfortable and unrestrictive\(^{119, 120}\).

The interview-guides
Due to the originality and the adopted holistic approach of the concept of optimal functionality in this thesis, the interview guides in studies I-III were not constructed based on existing literature searches for finding relevant questions for the discussions as McLafferty recommends in her study\(^{111}\), which can be seen as a limitation. All interview guides were instead designed using McNamara’s general guidelines for conducting research interviews as a base\(^{121}\).

The interview guide used in study I aimed to find a relevant search term for pursuing and exploring the concept of optimal functionality by asking the study participants to discuss perspectives regarding health, illness and maintaining health. It was not possible to construct the interview guide in study II based on existing literature when exploring methodological issues\(^{111}\). In order to extend the concept of optimal functionality a semi-structured interview was developed based on the three cornerstones of optimal functionality (Body-related factors, Self-related factors, and External factors) from the findings of study I. In study III the interview guide consisted of one question where the study participants were asked to describe a situation where they feel that their mental health has an impact on their ability to function as optimally as possible. The semi-structured interview guide for study IV comprised several questions to generate an extensive answer.

Data analysis
Inductive qualitative content analysis was used in studies I and IV and deductive qualitative content analysis in study II\(^{91}\). In study I the steps for a scoping review by Arksey and O’Malley\(^{87}\) was used after a suitable term had been retrieved through qualitative content analysis of the FGDs. A limitation here is that the included articles were not assessed for quality, which needs to be taken into consideration when interpreting the results in study I. The literature search did however retrieve articles in journals with a median impact factor of 1.678 (range 0–3.089; the impact factor was set to 0 for the three journals where it was not available), which falls within the normal range within this field. However, a scoping study design only
provides an overview of the literature. Content analysis is a research method that makes it possible for the researcher to explore subjects of theoretical matter in order to increase the understanding of the obtained data. The deductive qualitative content analysis in study II might have limited the possibility of gaining new input into the concept, but it is often used when testing concepts. Credibility during the analysis phase was ensured through on-going discussions in the research group where the doctoral students conducted the entire process. Since there were two doctoral students, a discussion regarding an uncertainty, a disagreement or if trustworthiness was in danger was always possible. In the pursuance of credibility during the analysis phase throughout all the studies, there were discussions in the research group and peer scrutiny when selecting the most appropriate meaning units from the data. Sandelowski argues that there are multiple realities and they are dependent on subjective interpretations, but dialogue among researchers in the research group is still recommended to reach credibility.

When presenting the findings and the quotes from study participants they needed to be translated from Swedish to English. To ensure credibility regarding the translation, a certified bilingual translator read through all data material, themes, categories and chosen quotes. During the whole process of translation there was discussion within the research group and with the translator to ensure the accuracy of the meaning and the expression. Furthermore, in all four studies the language was edited following the stages outlined by Regmi to ensure trustworthiness. Which are: 1) Determine relevance or context, 2) Forward translation, 3) Backward translation, and 4) Review the whole process again to receive similar interpretation.

Transferability through trustworthiness of the findings in studies I-IV can be transferred and extended to other contexts of older adults in the western world since all four studies included older adults in Sweden. Transferability means the possibility to extend the findings to other contexts or settings. To facilitate transferability the selection of study participants, their characteristics, the process of data collection and the analysing processes were clearly described in studies I-IV.

However, since the concept of optimal functionality is in its early evolutionary stages, it is important to note that the concept is not yet fully developed. In study I the findings showed that optimal functionality
among older adults in developed countries consists of three cornerstones accompanied by aspects, which in turn were accompanied by their respective factors raising the question of transferability. There is the question of if findings would generate the same factors, if articles from countries with significantly different cultures had been chosen. Another question is if the results were looked at from a gender perspective, would the results have been different. In study II the findings showed that optimal functionality is really a matter of functioning as optimally as possible and can be extended to other contexts such as health care settings. In study III it is important to state that transferability is possible, however it is essential to keep in mind that it was a homogeneous group, they were all female and had also received a score ≥8 on the HADS questionnaire. Even if the findings can be extended to other contexts, situations and settings, it is important to consider the fact that the older adults in study IV were interested and motivated. In summary, the aim of transferability applied throughout all of the studies, and in the end the possibility to extend findings to other contexts is up to the reader to decide. This concurs with Sandelowski who states that especially in qualitative research, the quality is assessed through the interaction between the text and the reader and that it is not only about guidelines but about taste as well. To facilitate transferability; all steps and procedures in all of the studies, such as data collection and process of analysis and a clear presentation of the findings are reported in the studies. The researcher tried to be as neutral and objective as possible in all of the studies to attain confirmability. All steps in the methodological section of each study were thoroughly described in order to capture the study participants’ experiences and avoid a reflection of the researcher’s views and thoughts.

Dependability was aimed for in all studies but not fully achieved. It will even be difficult for the researcher to repeat all of the steps of every process not to mention have other researchers attain the same results. Even though all processes and steps of a study are described meticulously it does not guarantee the same outcome. The researcher who has initially carried out the study and the researcher that tries to duplicate it may have different preunderstandings, which can have an effect when the steps of the study are repeated. However, by describing the process of the study thoroughly in studies I-IV, other researchers are able to repeat the process. It is still important to keep in mind that when conducting qualitative
research preunderstanding is involved even if it the researchers are aware of it making total dependability difficult.

Preunderstanding

Central in this thesis is the preunderstanding among those involved, which comprises not only received knowledge through one’s professional career but also through lived experiences. Primarily it is the personal preunderstanding of the author’s within the field of study and also experienced life events and professional background in acute psychiatric nursing care. From this professional background there has been some experience of caring for older adults in the hospital setting. Also involved in the studies was a physician, nurses from the geriatric field and professionals in the field of biomedicine. The questions and reflections generated originate from the different experiences of this multidisciplinary team. Nyström and Dahlberg imply that preunderstanding is something that the researcher can never be totally aware of nor avoid even when professions from other backgrounds are included and peer scrutiny is employed. Preunderstanding can be both an obstacle as well as an opportunity for attaining new knowledge. Being aware of one’s preunderstanding means that the researcher needs to put the preunderstanding in brackets so as to not influence the data. Research implies that bracketing is a skill, and to be able to be aware of preunderstanding and enable bracketing, one needs characteristics such as self-knowledge, sensitivity and reflexivity.

Bracketing was an aspiration during all four studies but became very apparent in study III in lieu of the author’s psychiatric nursing background and where a phenomenological approach inspired by Giorgi was adopted. Bracketing should be reflected upon and kept in mind throughout the entire research process and not just when collecting data or in the analysis phase. Bracketing is however a developmental process meaning that it is a process that takes place over time. The production of the four studies overlapped in time but from the development of the first, to the end of last study the skill of bracketing became sharpened. As it is important to be aware of your preunderstanding and put it in brackets, the author’s clinical experience being in something other than geriatrics that does not colour the research process can be seen as a strength. Additionally the multidisciplinary team with different backgrounds can be seen as a strength as well.
Discussion of the results

The main path of this thesis focused on exploring rather than developing the concept of optimal functionality among older adults as a subjectively experienced concept with a holistic perspective. To our knowledge, this is the first time the concept is being explored in relation to older adults and also in cooperation with them. The originality of the thesis is shown in studies I–III regarding the exploration of the concept of optimal functionality and has not been about developing a concept as outlined by for example Walker and Avant 133, or Rodgers’ approach of being positivistic and reductionistic 134 nor even the hybrid model presented by Schwartz-Barcott and Kim 135. It is instead about a beginning for another strategy for concept development called concept exploration. Concept exploration as a strategy is used when identifying new concepts, before they are accepted, equivocal and still at the stage of being considered 136. The goal in concept exploration is for readers and listeners to conclude that the concept is worth considering and developing further 136.

When beginning the exploration for the basis of the concept optimal functionality, in study I it was found that according to the older adults there were three major cornerstones (i.e. Body-related factors, Self-related factors and External factors). Taking the concept one step further, study II helped to extend the concept with the addition of factors that contribute to optimal functionality or as the older adults called it “functioning as optimally as possible” and the discovery that the major cornerstones were intricately linked to each other. Study III revealed three syntheses that separately or together affected one’s ability to function as optimally as possible. Study IV showed that older adults can be proficient in using interactive ICT-tools; which in a wider perspective enables the possibility to identify factors for functioning as optimally as possible, to implement them in an interactive ICT-tool, and to eventually measure optimal functionality. The discussion section that follows will focus on the meaning of optimal functionality by exploring (study I), extending (study II) and filling in gaps (study III) and investigating the possibility of implementing the concept in an ICT-platform (study IV) in order to address a heterogeneous population through the promotion of self-care and when more assistance is needed a PCC approach to health care.
The red thread throughout studies I-III has been the evolution of the concept with its constant subjective nature and a consideration for the preferences of the older adults. In the beginning in study I with the exploration of optimal functionality, it was revealed that Body-related factors, Self-related factors and External factors were all closely linked and important foundations for the concept to be built on. The included articles in study I were mainly of a quantitative character leaving a limited qualitative perspective on the concept. In study II, the concept, as discussed by the older adults themselves, evolved further revealing optimal functionality to be equal to the notion of functioning as optimally as possible. Additionally, study II also showed that the older adults spoke of all aspects of optimal functionality, but the aspect of mental health was not even mentioned. This can be due to stigmatization regarding mental health issues. Another reason the older adults did not mention mental health aspects could have been because they considered them to be normal rather than problems. The lack of discussion regarding mental aspects in study II was taken into study III with the aim to describe mental health in relation to functioning as optimally as possible. In study III the notion of functioning as optimally as possible evolved further and showed that mental health was described with three syntheses (life situations affecting mental health, consequences of mental health, and strategies to maintain good mental health) all affecting the older adult’s ability to function as optimally as possible.

The direction the older adult population is taking on the aging path seems to divide. On one hand it is stated that there are fewer older adults over the age of 65 who present decreased functional ability, impaired vision and mental health issues and that there are many older adults living healthy active lives. On the other hand it is also reported that pain and chronic conditions have increased among older adults leading to an increased number of them needing health care. This confirms that the older adult population is diverse and the progression of their health status cannot be drawn in any specific direction nor can their health be defined merely by their chronological age. The older adults experiencing good health will have few limitations to their ability to do the things they desire. Despite the good news regarding some older adults, if old age is dominated by declines in physical, mental or functional capacities there will be negative implications for the health care system e.g. increased
health care utilization and workload. This is of significance since it is reported that by increasing the workload for nurses with one patient the probability of mortality of an inpatient increases by 7% \textsuperscript{141}. That is why older adults in need of care need to be met by healthcare professionals versed in a PCC approach. It is an approach that can benefit both older adults who experience ill health and the healthcare professionals themselves. A framework for person-centred nursing consists of four parts: the prerequisites, the care environment, the person-centred processes and the expected outcomes \textsuperscript{142}. A PCC approach is not only important, but it is required by law in some countries to offer personalized care \textsuperscript{86}. Healthcare professionals adopting a PCC approach can contribute to an older adult’s ability to function as optimally as possible. By receiving care integrated with this approach it will help the older adults together with healthcare professionals to pinpoint the current important key factors contributing to their ability to function as optimally as possible in their current life. However, it is essential to understand that functioning as optimally as possible is not a linear process but a dynamic one that changes with one’s life situation. It is equally important to note that person-centred practice is not a static event either, and changes occur due to its complexity and multidimensional character \textsuperscript{143}. This indicates that healthcare professionals need to assume a flexible approach when working with the process of PCC and not become locked in the steps and phases.

The older adults who experience good health in old age will be able to function as a resource to themselves, to their families and also to the societies they live in \textsuperscript{10} making the promotion of self-care an important matter. With the realization of the factors important for one’s ability to function as optimally as possible, the older adult can employ appropriate self-care measures to experience good health and continue to be a resource. Self-care not only helps older adults stay independent and manage everyday life but it makes life meaningful \textsuperscript{144}. It is known that self-care strategies and self-management strategies are often linked to different health conditions that require the older adult’s attention and involvement, which are performed on a conscious level and research on self-care is mainly focused on mental health issues, sleep difficulties and diabetes \textsuperscript{145-149}. This makes it even more pressing to promote self-care when the older adults experience good health so it can be maintained for as long as possible. Promoting self-care concerns subjective and objective factors when assessing the older
adult’s self-care behaviours and the subjective factors can be assessed through identifying factors contributing to the older adult’s ability to function as optimally as possible. In studies I-IV self-care was revealed to be an important element, but with different levels and with different aspects playing a part in functioning as optimally as possible. In study I, self-care was presented as a capacity (Body-related factors) and was thus a contributing factor to OF. In study II, the older adults spoke of self-care as being able to stay independent (Body-related factors). In study III self-care was considered to be an attribute within one’s self, it was spoken of in relation to one’s mental health and was presented as a diversion strategy against mental distress (Self-related factors). Self-care was presented in study IV in the form of advice implemented in an ICT-platform and was experienced by the older adults as a way to get additional assistance when needed (External factors). This implies that self-care is something that can present itself in all aspects of an older adult’s life depending on how and in what way it is experienced, which makes it an important factor for functioning as optimally as possible. Whether the older adult is experiencing good health or bad in old age, if he/she is an inpatient in a ward in need of PCC and/or self-care, is living at home with care assistance or is an active older adult without any afflictions, is not the issue, it is the older adult alone who is aware of what contributes to their ability to function as optimally as possible.

It is important to point out the similarity of the notion of functioning as optimally as possible and the concept of capability. Capability as a concept is well known and well used in studies regarding older adults. Capability is defined as “an individual’s ability to perform actions in order to reach the goals he or she has reason to value.” ICECAP-O is the instrument for measuring capability among older adults and is used for economic evaluation. The notion of functioning as optimally as possible does not focus on any specific population of older adults while the measure of capability is often used among older adults with health conditions, mobility impairment and the frail oldest older adults. The notion of functioning as optimally as possible can be applied to older adults despite health status or age. Further, the notion of functioning as optimally as possible does not mention achieving any goals by actively carrying out actions, it is a notion which takes its lead from the point where the older...
adult is in life and his/her ability to function as optimally as possible from that standpoint, capability is a term concerned with reaching goals 43.

Up to this point in the thesis, the concept of optimal functionality or as the older adults call it “functioning as optimally as possible” concurs with Nordenfelt’s notion regarding the concept of health. Nordenfelt describes the concept of health as having three aspects working together (an individual’s ability, vital goals of the individual and the given circumstances) 56. “The individual’s ability” may refer to one’s inner ability and one’s inner strengths to accomplish something and can also be viewed as something similar to the Self-related factors; one of the three cornerstones in the structure of optimal functionality. “Vital goals” can be regarded as an individual’s physical ability, their vitality, and is also similar to the Body related factors in the structure of optimal functionality. External factors was one of the major cornerstones in study I and can be viewed as being similar to Nordenfelt’s “given circumstances” regarding the environment around the individual. It is however essential to make clear that health described by Nordenfelt and the three cornerstones of optimal functionality are not on the same level. Nordenfelt describes the notion of health while the notion of “functioning as optimally as possible” can be a dynamic pathway to health.

Nordenfelt’s description of health is holistic, which points to the fact that the whole human being is considered and does not refer to health in terms of individual organs 57. This conforms to the holistic approach incorporated in the notion of optimal functionality. However, aside from this similarity, it is important to be clear about one major difference between the optimal functionality and the concept of health as outlined by Nordenfelt 56. The concept of optimal functionality is explored and designed for older adults over the age of 65 while Nordenfelt’s description of health is applicable to people of all ages. However, Sarvimäki is involved in research focusing on health 59, 155 and health promotion 156, 157 among older adults, which is more in line with the concept of optimal functionality and its applicability to the older adult population. Older adults themselves define health as having the ability to be the person they see themselves to be, to do what they want to do and to feel well and have the necessary amount of strength 59. Furthermore, health promotion among older adults is about the individual’s resources 157 and it is also described as an individual process built on the individual’s life and situations 59. This
confirms that health and health promotion are subjective and need to be based on the older adults' views, and this is in line with the subjectivity of optimal functionality. It cannot be a concept divided into pieces dictating to the older adult to be or feel in a specific way in order to experience health. It is however important to state that health according to Sarvimäki and colleagues differs from the concept of optimal functionality. Optimal functionality applies to the entire older adult population, whereas their concept of health among older adults focuses mainly on older adults needing some kind of care or assistance in the home or the hospital setting. It is important to note that one of the major and overarching notions of optimal functionality is its subjectivity and thus is experienced differently by all older adults despite age or health status.

The main findings in study IV showed a promising ability among older adults in the use of an interactive ICT-platform to report health issues. The older adults in the study did not find the usage of the tool too complex or difficult and their successful management of the technical device resulted in the older adults experiencing a sense of pride and accomplishment. It is reported that ICT-tools designed for older adults should be kept simple and beneficial. The questions implemented in the ICT-platform as previously mentioned were health status concerns, which indicates that the subjectivity of the ICT-platform was limited. A result in study IV showed that the older adults found the concerns in the ICT-platform appropriate, but they expressed a desire for an additional space where they could include free text. This is an indication that the older adults felt the ICT-platform was too restrictive and their concerns could not be fully addressed. Subjectivity is therefore an important aspect when developing an ICT-tool for older adults. This is supported in research where the heterogeneity of older adults as a group is confirmed and the importance of considering the older adults' lived experiences and the adjustment of technology to their lives is stressed.

With the future development of an ICT-tool the subjective aspect should be kept in mind throughout the entire design and development process. Even though it is not fully possible to ensure subjectivity, it is essential to develop an ICT-platform together with older adults themselves. As one study points out, it is always rewarding to include older adults in the process of developing an ICT-tool because it enables one a glimpse into their lives. This is a clear indication of the importance of...
involving older adults in the developmental process but also of engaging them in the evaluation and improvement of an ICT-tool. It is also important to remember that study IV was merely a pilot study to see whether older adults could manage an ICT-tool and their experiences of it.

By developing an ICT-tool with factors contributing to the notion of functioning as optimally as possible, older adults’ mental health may be affected in a positive way. It is important to note that using the Internet can increase the mental well-being of older adults. Additionally, it is important to point out that the concerns in the ICT-platform in study IV were health issues experienced by the older adults in need of a cure or treatment from healthcare professionals. The concept of optimal functionality focuses on subjective factors. It focuses on what contributes to the ability to function as optimally as possible and not on what can be remedied. An ICT-tool can as a first step facilitate the identification of factors important for the older adult’s ability to function as optimally as possible and eventually measure OF as well. The contributing factor of self-care can be promoted and enhanced with the use of an ICT-tool, and it can enable older adults to maintain their preferred independent lifestyle for as long as possible.

**Conclusion**

While exploring the concept of optimal functionality among older adults, it has become clear throughout this thesis that it is a subjective and holistic concept that is applicable to all older adults. Although it is a concept in need of further research and development, the current notion is that it is dynamic and a matter of functioning as optimally as possible. Changes in life can alter one’s ability to function as optimally as possible. One’s preferences and perception of functioning as optimally as possible can also vary over time and with life’s changes. However, if an older adult is in need of health care because of an alteration or change in their life or health status they may need to re-evaluate which factors according to their preferences contribute to their functioning as optimally as possible at that time. When older adults need assistance from health care professionals adopting a PCC approach they can get guidance to help them identify factors important for their optimal functionality. In the future with optimal functionality and the implementation of it in ICT-tools older adults can be more self-sufficient and experience health, which will enable them
to be a resource to themselves, their families and the societies they live in. When the older adults need little or no help, they can continue to maintain their health with self-care. Furthermore, if an instrument to identify factors that contribute to one’s ability to function as optimally as possible is developed it can promote self-care and be a possible facilitator for a life on one’s own terms. Changes occur in life, older adults can respond by identifying the factors for functioning as optimally as possible and with the support of self-care and/or person-centred care continue on their path to health. Figure 4 presents the possible path to health.

Future work and clinical implications
Optimal functionality is not yet a concept ready for a real concept development. It is still more of a notion that has been brought up to a conscious level, one that perhaps sparks some curiosity among researchers who consider the notion worthy of further development. Developing this notion to a concept useful for nursing science and health care, and producing an understanding will be a great undertaking. Sandelowski states that the aim of qualitative inquiry is converting the knowledge of research to an understanding. As the notion of “functioning as optimally as possible” is not yet a fully developed concept, future research and
work should focus on its development towards a concept following a model for concept development suggested by Walker and Avant. As a first step, one way of developing the concept is to send out a survey to a large sample of older adults and ask them what functioning as optimally as possible means to them. This can then be followed up by validating the surveys with FGDs. Further, research should focus on the gender aspect of optimal functionality to uncover if there are any differences in genders regarding the concept of optimal functionality. It is important to point out that as long as there are older adults, the notion of functioning as optimally as possible will never be fully completed. Even though it is not yet a fully developed concept, it can be of assistance when identifying what is important for an older adult expressed by the older adults themselves, and it can still be introduced in different health care settings. The concept as it is right now can be introduced in seminars for researchers, in the hospital setting for healthcare professionals and in different senior organizations for older adults to inform everyone regarding the subjectivity of the concept and the possibility of identifying important factors for optimal functionality.

An attempt to develop an instrument for use in health care and implementing it in an ICT-tool should be made. The instrument can be of assistance to both older adults and healthcare professionals. For the older adults, it will give them the possibility to identify the factors that contribute to their ability “to function as optimally as possible”. Identification of factors can also be accomplished with the assistance of healthcare professionals and in the future in conjunction with the help of an ICT-tool. For the healthcare professionals, the ICT-tool can help them see the person as a whole and not just as a patient through their increased awareness of the factors contributing to the older adults ability to function as optimally as possible. In the same way an ICT-tool can also help the healthcare professionals design a personalized strategy for care. With the identification of the factors for optimal functionality, the measurement of it can eventually also be possible, making the attainment of it something all older adults can experience.
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