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Exploring Mental Well-Being and Motivation in Tele-Rehabilitation for Elderly Home Users: A Scoping Review

Metropolia University of Applied Sciences

Master of Engineering

Information Technology

Master's Thesis

27 May 2026

PREFACE

This thesis was completed as part of the Master of Engineering degree in Information Technology at Metropolia University of Applied Sciences. The work was developed from an interest in digital health, rehabilitation technology and the everyday experiences of older adults who use home-based care. The topic became especially meaningful because tele-rehabilitation is often discussed through physical outcomes, while the emotional and motivational side of rehabilitation receives less direct attention.

Helsinki, 27 May 2026
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Abstract

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Title:	Exploring Mental Well-Being and Motivation in Tele-Rehabilitation for Elderly Home Users: A Scoping Review
Number of Pages:	53 pages + 1 appendix
Date:	27 May 2026
Degree:	Master of Engineering
Degree Programme:	Information Technology
Professional Major:	Medical Technology
Supervisors:	Päivi Haho, Principal Lecturer Mikael Soini, Principal Lecturer

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The purpose of this thesis was to explore how mental well-being and motivation are addressed in tele-rehabilitation for elderly home users. The study was conducted as a scoping review because the topic covers different types of evidence, interventions and outcome measures. The review focused on home-based or remotely supported rehabilitation for elderly users, with attention to motivation, emotional experience, usability, quality of life, self-care, acceptance and engagement. The evidence synthesis included twelve studies. Six studies were direct-focus tele-rehabilitation studies, while six were contextual supporting studies on telehealth adoption, technology anxiety, digital readiness, usability and barriers among older adults. Methodological and background sources were used separately to support definitions, reporting and review design, but they were not counted as evidence studies. The data were charted and analysed using a descriptive thematic approach. The findings showed that mental well-being and motivation were present in the reviewed literature, but they were usually addressed indirectly. Motivation appeared through enjoyment, self-awareness, feedback, routine contact, adherence, goal setting and local support. Mental well-being appeared through quality of life, therapeutic self-care, confidence, reassurance, social connection, therapeutic relationship and perceived safety. Usability and acceptance were also important because engagement depended on understandable technology, clear instructions, digital confidence and human support.

The thesis concludes that tele-rehabilitation for elderly home users should be understood as a supported rehabilitation process rather than only as remote exercise delivery or a technical service. From a technology perspective, systems should be simple, reliable and older-adult-friendly. From a healthcare and social perspective, tele-rehabilitation should include professional guidance, emotional reassurance and support that fits the user's home situation. Future research should measure motivation and mental well-being more directly and examine how tele-rehabilitation can support long-term engagement after structured programmes end.

Keywords: tele-rehabilitation, telehealth, older adults, elderly home users, mental well-being, motivation, technology acceptance, home-based rehabilitation, scoping review

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Contents

List of Abbreviations

BREQ-3	Behavioural Regulation in Exercise Questionnaire
CABG	Coronary Artery Bypass Grafting
CAT	COPD Assessment Test
CHF	Chronic Heart Failure
COM-B	Capability, Opportunity, Motivation and Behaviour
COPD	Chronic Obstructive Pulmonary Disease
DHT	Digital Health Technology
HRQoL	Health-Related Quality of Life
JBI	Joanna Briggs Institute
PASE	Physical Activity Scale for the Elderly
PCC	Population, Concept, Context
PRISMA-ScR	Preferred Reporting Items for Systematic Reviews and Meta- Analyses extension for Scoping Reviews
SDT	Self-Determination Theory
SDTSCM	Sidani Doran Therapeutic Self-Care Measure
SUS	System Usability Scale
UTAUT	Unified Theory of Acceptance and Use of Technology
UCD	User-Centred Design
WHO	World Health Organisation

1 Introduction

1.1 Background of the study

Rehabilitation is an important part of healthcare because it helps people improve, maintain, or regain functioning after illness, injury, surgery, disability, or long-term health conditions. The World Health Organization (WHO) defines rehabilitation as interventions that optimize functioning and reduce disability in people with health conditions in interaction with their environment. Rehabilitation therefore supports not only recovery from disease, but also independence, participation, and everyday life. (WHO 2024.)

Tele-rehabilitation has become an important part of this development because it allows rehabilitation to be guided, monitored, or supported through remote communication technologies. In this thesis, tele-rehabilitation refers to rehabilitation that is delivered at a distance through tools such as video consultations, telephone follow-up, wearable monitoring, online exercise resources, mobile applications and interactive home-based systems (Gamble et al. 2024, p. 457; Seinsche et al. 2023, p. 10).

This topic is especially relevant for elderly home users because many older adults need rehabilitation after surgery, chronic disease, falls, mobility decline or hospital discharge. Regular clinic visits may be difficult because of pain, fatigue, transport problems, reduced mobility or dependence on others. Home-based tele-rehabilitation can reduce some of these barriers by allowing rehabilitation support to continue in the person’s everyday environment. Previous studies have shown that tele-rehabilitation can support functional performance, exercise tolerance, quality of life and therapeutic self-care in older adult groups. However, these findings mainly describe physical and functional outcomes, while the emotional and motivational experience of elderly home users remains less clearly addressed (Gamble et al. 2024, p. 457; Bernocchi et al. 2018, p. 82; Khalil et al. 2024, p. 139).

For this reason, rehabilitation at home should not be understood only as a physical process. Elderly users may also need confidence, emotional support, routine contact, and encouragement to continue rehabilitation over time. If the person feels unsupported, anxious, confused or unmotivated, participation may weaken even when the programme itself is clinically appropriate. Older adults may also experience practical and emotional barriers when using remote health technologies. These barriers can include low digital confidence, limited digital skills, weak internet access, lack of a suitable device, fear of making mistakes and preference for face-to-face care.

1.2 Problem Statement

Tele-rehabilitation has potential to improve access to rehabilitation for elderly home users. It can reduce travel demands, support remote follow-up and allow rehabilitation to continue in the home environment. However, much of the existing tele-rehabilitation evidence focuses on physical outcomes such as mobility, exercise capacity, functional performance, self-care and quality of life. These outcomes are important, but they do not fully explain how elderly users experience rehabilitation emotionally and motivationally. This is important because rehabilitation requires active participation. Elderly users may need to complete exercises regularly, follow instructions, communicate with professionals, use digital devices and continue the programme for several weeks. If the person feels anxious, isolated, confused, unsupported or unmotivated, participation may become weak. In that situation, the technology may be available, but the rehabilitation process may still fail to support the user effectively (Gamble et al. 2024, p. 457; Bernocchi et al. 2018, p. 82; Khalil et al. 2024, p. 139; Shulver et al. 2017, pp. 120–123; Dawson et al. 2024, pp. 5–6; Chen et al. 2024, p. 1).

The literature shows that motivation and well-being are important, but these issues are not always studied directly. These motivational and emotional elements are scattered across different studies, intervention types and outcome measures. Some studies measure quality of life and self-care. Some examine

usability and technology acceptance. Other studies explore user experience through interviews. This makes it difficult to understand clearly how mental well-being and motivation are addressed across the field.

Therefore, this thesis aimed to map the existing literature, identify what was already known, describe what emotional and motivational outcomes were reported and clarify what gaps remained. This helped show whether tele-rehabilitation research for elderly home users has paid enough attention to the psychological and motivational side of rehabilitation (Tricco et al. 2018, p. 467; JBI 2024).

1.3 Research Questions and Aim

The aim of this thesis was to explore how mental well-being and motivation are addressed in tele-rehabilitation for elderly home users. The main research question is:

How are mental well-being and motivation addressed in tele-rehabilitation for elderly home users?

The study was guided by two sub-questions:

1) *What motivational and emotional outcomes are reported in existing studies on tele-rehabilitation for elderly users?*

2) *What challenges and gaps are identified in the literature regarding mental well-being and motivation in tele-rehabilitation for elderly users?*

These questions were suitable for a scoping review because they aimed to map and describe existing literature rather than compare the effectiveness of one specific intervention. They also follow the logic of the PCC framework by focusing on elderly users as the population, motivation and mental well-being in tele-rehabilitation as the concept and home-based remote rehabilitation as the context (JBI 2024; Tricco et al. 2018, p. 467).

1.4 Scope and Significance

This thesis was conducted as a scoping review. It did not test a new intervention or collect participant data. Its purpose was to map the existing literature, identify relevant themes and describe how motivation, emotional experience, usability, acceptance and related well-being outcomes were discussed in tele-rehabilitation for elderly home users.

The study was significant for two reasons. First, it addresses a growing healthcare need. Second, it focuses on a part of rehabilitation that is often discussed only indirectly. The review therefore helped clarify what the literature showed and where important evidence gaps remained.

For healthcare professionals, this thesis may help show why motivation, emotional well-being and usability should be considered when planning tele-rehabilitation services. For technology developers, the review may highlight the need for older-adult-friendly design, clear instructions, simple interfaces and support mechanisms. For future researchers, the thesis may identify gaps where more direct research is needed on motivation and mental well-being in elderly tele-rehabilitation users (Seinsche et al. 2023, p. 10; Chen et al. 2024, p. 1; Fleischer et al. 2025, p. 9).

1.5 Structure of the Thesis

This thesis is organized into six chapters. Chapter 2 presents the background of the study and discusses tele-rehabilitation, elderly home users, mental well-being, motivation, digital readiness, barriers and the research gap. Chapter 3 describes the methods and materials, including the scoping review design, PCC framework, eligibility criteria, search strategy, screening process, evidence categories, data extraction, data analysis, ethical considerations and use of AI tools. Chapter 4 presents the results and analysis of the selected literature. Chapter 5 discusses the findings in relation to the research questions and

presents the implications, limitations, future research needs and conclusion. Chapter 6 provides the final summary of the thesis.

2 Background

2.1 Tele-rehabilitation

Tele-rehabilitation is part of a wider shift toward digital and remote healthcare. It uses communication technologies to support rehabilitation when the user and the professional are not in the same physical location. In practical terms, it may involve video consultations, scheduled phone support, wearable monitoring, digital exercise guidance, remote assessment and interactive training systems (Gamble et al. 2024, p. 457; Seinsche et al. 2023, p. 1).

For older adults, tele-rehabilitation is relevant because rehabilitation often needs to continue after hospital discharge or between in-person appointments. Home-based delivery can help connect rehabilitation to everyday routines and reduce the burden of repeated travel. Gamble et al. (2024, p. 457) described telerehabilitation as a promising alternative to in-person rehabilitation for improving functional performance in community-dwelling older adults. Bernocchi et al. (2018, p. 82) and Khalil et al. (2024, p. 139) also showed that structured home-based telerehabilitation can support rehabilitation outcomes in older patient groups.

2.2 Elderly Home Users

Elderly home users may benefit from tele-rehabilitation because many older adults face barriers when attending regular rehabilitation appointments. These barriers may include reduced mobility, chronic illness, fatigue, pain, fear of falling, transport problems, distance from services or dependence on other people. Home-based tele-rehabilitation can reduce some of these difficulties by bringing rehabilitation support closer to the person’s everyday environment (WHO 2024; Shulver et al. 2017, pp. 120–123; Dawson et al. 2024, pp. 5–6).

The home environment is important because rehabilitation often needs to continue beyond hospital discharge or clinical appointments. For older adults,

recovery may depend on repeated practice, daily routines, confidence and support. When rehabilitation is connected to the home setting, the user may practise activities in the same environment where daily life takes place. This can make rehabilitation more practical and meaningful for elderly users (WHO 2024; Gamble et al. 2024, pp. 457–458; Shulver et al. 2017, pp. 120–123).

Dawson et al. (2024) showed that telephysiotherapy can expand care opportunities for older adults when local support is available. Shulver et al. (2017) found that older participants valued the convenience of not having to travel for every rehabilitation contact. These findings support the view that tele-rehabilitation can improve practical access, but only when it is designed around the user's actual abilities and home situation (Dawson et al. 2024, p. 5; Shulver et al. 2017, p. 120).

2.3 Mental Well-Being

Mental well-being is an important part of rehabilitation because recovery is not only physical. Illness, surgery, disability, reduced mobility and long-term health conditions can affect confidence, independence, mood and everyday participation. In this thesis, mental well-being is understood broadly. It refers to emotional experience, confidence, reassurance, sense of control, perceived support and the ability to participate in daily life during rehabilitation. This understanding is relevant because rehabilitation aims to support functioning and independence, not only physical performance (WHO 2024; Khalil et al. 2024, pp. 139–140; Shulver et al. 2017, pp. 120–123).

For elderly home users, mental well-being may be closely connected to daily routines. An older adult may feel more confident when rehabilitation is understandable, safe and connected to personal goals. However, the opposite may also occur. If the person feels isolated, confused or unsupported, rehabilitation may become difficult to continue. This is important in tele-rehabilitation because the user often needs to participate from home, follow instructions and manage part of the process without the professional being

physically present (Shulver et al. 2017, pp. 120–123; Dawson et al. 2024, pp. 6–7; Chen et al. 2024, p. 1).

2.4 Motivation in Rehabilitation

Motivation is a central factor in rehabilitation because recovery requires repeated effort over time. For older adults, rehabilitation often involves completing exercises regularly, following instructions from professionals, using digital tools and maintaining participation across several weeks or months. Whether a person starts, continues or stops a rehabilitation programme can therefore depend strongly on their level of motivation. Understanding what drives and sustains motivation is important for designing rehabilitation services that older adults can genuinely engage with (Dawson et al. 2024, p. 6; Shulver et al. 2017, p. 120; Seinsche et al. 2023, p. 10).

Motivation in rehabilitation is not a single concept. It can be understood through the lens of Self-Determination Theory (SDT), which distinguishes between intrinsic and extrinsic forms of motivation. Intrinsic motivation refers to engaging in an activity because it is personally meaningful, enjoyable or satisfying. Extrinsic motivation refers to participation driven by external factors such as encouragement from a professional, scheduled contact or structured goals. According to SDT, intrinsic motivation is more likely to support long-term engagement when individuals feel a sense of autonomy, competence and relatedness in the activity they are performing. SDT principles have been applied in telephysiotherapy programmes to support motivation through autonomy, competence and relatedness. (Dawson et al. 2024, p. 11.)

The COM-B model addresses Capability, Opportunity, Motivation and Behaviour and offers another useful framework for understanding motivation in rehabilitation contexts. The model has been applied in telephysiotherapy programmes to support behaviour change in older adults by addressing their capability, opportunity and motivation to exercise. (Dawson et al. 2024, p. 11.)

Self-efficacy is also closely related to motivation in rehabilitation. Self-efficacy in tele-rehabilitation has been linked to the coaching approach provided by therapists, where feeling capable and supported can strengthen an older adult's confidence to continue rehabilitation independently. (Shulver et al. 2017, p. 125.)

Enjoyment is another dimension of motivation that is relevant in tele-rehabilitation. Seinsche et al. (2023) measured training motivation among older adults using the Behavioural Regulation in Exercise Questionnaire (BREQ-3), which is grounded in SDT and assesses different regulatory types including intrinsic, identified, introjected and external regulation. Enjoyment has been identified as closely linked to motivation in tele-rehabilitation, with interactive formats showing potential to sustain engagement in older adults. (Seinsche et al. 2023, p. 11.)

Adherence and engagement in home-based tele-rehabilitation have been linked to convenience, flexibility and personalised feedback, suggesting that programme structure plays an important role in sustaining motivation among older adults. (Khalil et al. 2024, p. 143.)

2.5 Digital Readiness and Technology Acceptance

Digital readiness is important in tele-rehabilitation because the service depends on the user’s ability, confidence and willingness to use technology. In this thesis, digital readiness means more than having access to a device. It also includes digital skills, confidence, internet access, perceived usefulness, trust in the service and available support. For elderly home users, these factors may strongly influence whether remote rehabilitation feels manageable or stressful (Chen et al. 2024, p. 1; Fleischer et al. 2025, pp. 1–2; Tan et al. 2025, p. 1).

Older adults are not a single group with the same level of digital ability. Some older users may be confident with video calls, mobile applications or wearable devices. Others may have limited experience with digital tools or may feel anxious when using them. This means that tele-rehabilitation services need to consider

different levels of digital confidence. A service that is simple for one user may be difficult for another user if the instructions, device setup or interface design do not match their needs (Seinsche et al. 2023, pp. 1–2; Fleischer et al. 2025, pp. 1–2; Man et al. 2025, pp. 256–257).

Technology anxiety is one important barrier in remote care. For some older adults, digital health tools may create uncertainty, stress or fear of doing something wrong. Chen et al. (2024) reported that technology anxiety was linked with weaker intention to use digital health technologies among older adults. Tandon et al. (2024) also identified technological anxiety as a reason against telehealth adoption, together with personal inertia and weaker empathetic or social interaction. These findings are important for tele-rehabilitation because anxiety about technology may reduce confidence before the rehabilitation itself even begins (Chen et al. 2024, p. 1; Tandon et al. 2024, pp. 9–10).

Usability is another important issue. Tele-rehabilitation technology should be easy to see, understand and operate. Older adults may face difficulties with small screens, unclear instructions, poor contrast, device positioning, connection problems or complicated steps. If the technology is difficult to use, the user may lose confidence or stop participating. Therefore, usability is not only a technical issue. It can directly affect motivation, engagement and the user’s experience of support (Seinsche et al. 2023, pp. 1–2; Dawson et al. 2024, p. 12; Shulver et al. 2017, p. 124).

Access and support also shape digital readiness. Some older adults may not have a suitable device, stable internet connection or a person nearby who can help with technical problems. Others may prefer in-person care because direct contact with a professional feels more reassuring. Man et al. (2025) showed that limited digital literacy, device access problems and lack of human interaction were important barriers to telehealth use among elderly adults. These barriers suggest that tele-rehabilitation should include clear guidance, technical support and human connection, not only digital access (Man et al. 2025, pp. 256–257; Dawson et al. 2024, pp. 1–2; Shulver et al. 2017, pp. 120–123).

2.6 Research Gap

The background literature shows that tele-rehabilitation for older adults has been studied in relation to functional performance, exercise capacity, quality of life, self-care, usability, acceptance and access to care. These topics are important, but they do not fully explain how elderly home users experience tele-rehabilitation emotionally or motivationally. This creates a research gap because participation in rehabilitation depends not only on clinical content or technology, but also on confidence, support, self-awareness, enjoyment and reassurance (Gamble et al. 2024, p. 457; Shulver et al. 2017, pp. 120–123; Dawson et al. 2024, pp. 5–6; Seinsche et al. 2023, p. 10).

The gap is not that mental well-being and motivation are completely absent from the literature. Rather, these concepts are often addressed indirectly and inconsistently. Some studies report quality of life, self-care or adherence. Other studies focus on user experience, usability, technology acceptance or digital barriers. Because the evidence is spread across different study designs and outcome measures, it is difficult to see clearly how mental well-being and motivation are understood in tele-rehabilitation for elderly home users (Bernocchi et al. 2018, pp. 82–84; Khalil et al. 2024, pp. 139–140; Tan et al. 2025, p. 1; Chen et al. 2024, p. 1).

This thesis responds to this gap by mapping the existing evidence and identifying how motivation, mental well-being, usability, acceptance and barriers appear across tele-rehabilitation and related older-adult telehealth literature. The purpose is not to prove the clinical effectiveness of one intervention. Instead, the purpose is to clarify what is already known about these concepts, how the evidence is currently reported and where further research is still needed (Arksey and O'Malley 2005, pp. 21–22; Levac et al. 2010, pp. 2–3; Tricco et al. 2018, p. 467; JBI 2024).

3 Methods and Materials

3.1 Study Design

This thesis used a scoping review approach. A scoping review was suitable because the topic was broad and included different types of evidence, such as randomized controlled trials, systematic reviews, qualitative studies, usability studies and telehealth adoption studies. The purpose was to map the existing literature rather than measure the effectiveness of one specific intervention through statistical comparison. The review approach followed the methodological framework proposed by Arksey and O'Malley (2005), which provides a structured process for mapping evidence across a broad topic area. This thesis also followed the PRISMA Extension for Scoping Reviews. PRISMA-ScR builds on the original PRISMA 2020 reporting guidelines and supports transparent reporting of scoping reviews, helping show how records were identified, screened and included (Tricco et al. 2018; Page et al. 2021).PCC Framework and Eligibility Criteria

The thesis question was developed using the PCC framework. PCC stands for Population, Concept and Context. This framework is commonly used in scoping reviews because it helps define the focus of the review clearly. In this thesis, the population was elderly users or older adults, the concept was tele-rehabilitation in relation to mental well-being and motivation, and the context was home-based, community-based and remote rehabilitation. Table 1 presents the PCC framework used in this thesis. (JBI 2024.)

Table 1. PCC framework used in this thesis.

PCC element	Focus on this thesis
Population	Elderly users or older adults

Concept	Tele-rehabilitation, motivation, mental well-being, engagement, emotional outcomes, usability, acceptance and adherence
Context	Home-based, community-based and remote rehabilitation settings

The population was elderly users and older adults. In this thesis, the terms elderly, older adults and elderly home users are used interchangeably and refer to people aged 65 years and above or described as older or elderly in the selected studies. This age threshold reflects the criteria used in the included studies and is commonly applied in gerontological and rehabilitation research when defining older adult populations. Studies were considered relevant when they clearly included older adults, elderly people, older rehabilitation patients or older adults receiving home-based remote healthcare support. This population was important because older adults may have rehabilitation needs related to chronic disease, surgery, falls, reduced mobility, functional decline and difficulty accessing regular face-to-face services. The concept was tele-rehabilitation and its connection to motivation and mental well-being. For the purposes of this thesis, these terms are defined as follows. Mental well-being is understood broadly. It includes emotional experience, confidence, self-awareness, reassurance, quality of life, anxiety, perceived support and psychological comfort during rehabilitation. Motivation includes willingness to participate, engagement with exercises, adherence, enjoyment, self-efficacy and readiness to continue rehabilitation.

The context was home-based, community-based and remote rehabilitation. This included rehabilitation delivered outside traditional face-to-face clinical settings through digital communication, remote monitoring, telephone support, video consultation, online resources, wearable devices and related telehealth tools. This context is relevant because the home environment can support rehabilitation access, but it can also create challenges related to technology, safety, space, support and confidence (Bernocchi et al. 2018, pp. 82–83; Khalil et al. 2024, pp. 139–140; Fleischer et al. 2025, p. 9).

The inclusion and exclusion criteria were developed using the PCC framework and the aim of the thesis, as shown in Table 2. Direct evidence studies needed to have a clear connection to tele-rehabilitation or telephysiotherapy for older adults. Contextual evidence studies needed to involve older adults and address factors relevant to remote care use, such as technology anxiety, telehealth adoption, digital literacy, perceived usefulness, subjective well-being and readiness. Studies used only for definitions, methodology and institutional guidance were cited where needed, but they were not treated as included evidence studies in the results synthesis (Arksey and O'Malley 2005, pp. 22–27; Tricco et al. 2018, pp. 467–470; JBI 2024).

Table 2. Inclusion and exclusion criteria used in this scoping review.

Criteria	**Inclusion**	**Exclusion**
Population	Studies involving older adults or elderly users	Studies focusing only on younger adults or general adults without older adult relevance
Concept	Tele-rehabilitation, telephysiotherapy, remote rehabilitation, motivation, mental well-being, engagement, usability, adherence, technology acceptance or related user experience	Studies with no connection to rehabilitation, telehealth, digital health use, motivation, well-being, usability or user experience
Context	Home-based, community-based, remote or digitally supported care settings	Purely hospital-based rehabilitation without remote or home-based elements

Criteria	Inclusion	Exclusion
Study type	Systematic reviews, randomized controlled trials, qualitative studies, usability studies, survey studies and relevant empirical studies	Opinion pieces, non-academic sources or studies without enough methodological detail
Language	English-language studies	Non-English studies
Publication period	Mainly recent studies from the last ten years, with older studies included when methodologically or thematically important	Older studies with limited relevance to the current topic

This thesis treats mental well-being and motivation as connected but different concepts. Mental well-being is related to how the older adult feels during rehabilitation, including confidence, support, safety and emotional comfort. Motivation is related to the user's willingness to participate and continue the rehabilitation process. Both concepts are important because tele-rehabilitation depends not only on technology or clinical content, but also on the user's confidence, engagement and everyday experience (Shulver et al. 2017, pp. 120–123; Dawson et al. 2024, pp. 6–7; Gamble et al. 2024, pp. 457–458).

3.2 Search Strategy

The main database used in the first stage of the search was PubMed. PubMed was selected because it provides strong coverage of medical, health and rehabilitation research. The search terms were developed from the main parts of

the research topic: tele-rehabilitation, elderly users, home-based rehabilitation, motivation, engagement and mental well-being. Additional studies were later identified through reference checking and topic-based searching when they were relevant to the research questions. This approach was used in line with scoping review guidelines to support the comprehensiveness of the search (Tricco et al. 2018, p. 470; JBI 2024).

The first PubMed search was conducted on 16 February 2026. The main search string was:

(telerehabilitation OR "tele-rehabilitation") AND (elderly OR "older adult") AND (home OR "home-based") AND (motivation OR "mental well-being" OR engagement)

This first search produced 117 records. After applying initial filters limiting results to English-language publications from 2015 onwards, 93 records remained for screening.

Additional topic-based searching was conducted between February and March 2026 to identify contextual studies on telehealth adoption, technology anxiety, digital readiness, usability and barriers among older adults. Search terms used included telehealth adoption, technology anxiety, digital literacy, barriers to telehealth and older adults. These searches were carried out in PubMed and through the reference lists of the six direct-focus evidence studies already identified. Contextual studies were included only when they helped explain factors that could affect elderly users' acceptance and engagement with remote rehabilitation. Methodological and background sources were searched separately and used only to support the method, definitions, background and ethical reporting.

3.3 Screening and Selection Process

The detailed screening and selection process is explained in this section and presented in the PRISMA-style flow diagram in this section. The study selection process was carried out in stages. After the initial database search and preliminary screening criteria, 93 records remained for title and abstract screening. These records were screened according to the PCC framework and the research questions of the thesis. The screening process followed the general logic of scoping review methodology, in which relevant sources are identified, selected, charted and reported transparently (Arksey and O'Malley 2005; Levac et al. 2010; Tricco et al. 2018; JBI 2024).

During title and abstract screening, records were excluded when they did not focus on older adults, did not relate to tele-rehabilitation or remote health care, did not include user-related findings or focused only on technical systems without relevance to motivation, mental well-being, usability, acceptance or barriers. After this stage, 12 articles were selected for full-text eligibility assessment and evidence synthesis.

The 12 eligible articles were then reviewed according to their role in the thesis. Six studies were selected as direct-focus evidence studies because they focused directly on tele-rehabilitation, telephysiotherapy or home-based rehabilitation for older adults. These studies formed the main evidence base for the results and interpretation chapter.

Six additional studies were selected as contextual supporting evidence. These studies focused on telehealth adoption, digital health adoption, technology anxiety, digital literacy, subjective well-being, device access and barriers among older adults. They were included because they supported the interpretation of usability, acceptance, digital readiness and the roles of motivation and mental well-being among older adults using remote health technologies. However, they were not used to claim the clinical effectiveness of tele-rehabilitation or to make direct conclusions about motivation and mental well-being as outcomes.

Methodological, background and institutional guidance sources were used separately to support the method, definitions, background and ethical reporting. These sources were not included in the PRISMA eligibility count and were not counted as evidence studies in the results synthesis. The final study selection process is presented in the PRISMA-style flow diagram, Figure 1

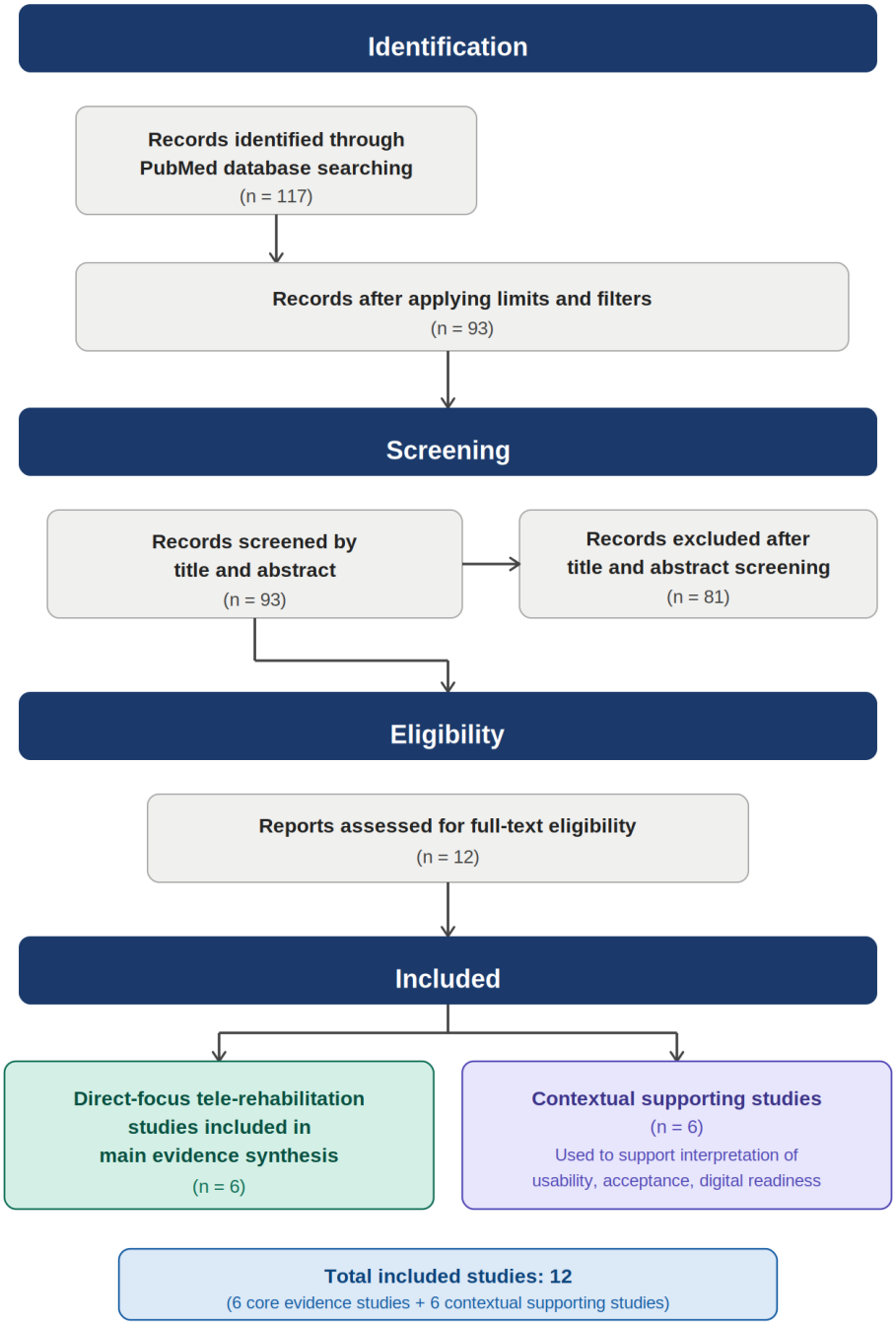

Figure 1. PRISMA-style flow diagram of the study selection process.

The diagram presents the study selection process across four stages: identification of 117 records through PubMed, screening by title and abstract, full-text eligibility assessment of 12 reports, and final inclusion of 12 studies divided into six direct-focus tele-rehabilitation studies and six contextual supporting studies.

3.4 Evidence Categories

The 12 evidence studies used in this thesis were organized into two main categories. This was done to keep the review clear and to avoid treating all evidence studies as having the same role. The first category was direct-focus tele-rehabilitation evidence. These studies focused directly on tele-rehabilitation, telephysiotherapy or home-based rehabilitation for older adults. They formed the main evidence base for the results and interpretation chapter because they were directly connected to the population, concept and context of the review.

The direct-focus evidence was used to examine how motivation, mental well-being, quality of life, self-care, engagement, usability and user experience appeared in tele-rehabilitation for older adults. These studies were especially important because they showed how remote rehabilitation was delivered, how older adults experienced it and what outcomes were reported in rehabilitation-related settings.

The second category was contextual supporting evidence. These studies did not always focus specifically on rehabilitation, but they involved older adults and addressed issues that were important for understanding remote care use. These issues included technology acceptance, technology anxiety, digital literacy, subjective well-being, perceived usefulness, device access and barriers to telehealth use. These studies supported the interpretation of usability, acceptance and digital readiness among elderly home users.

The contextual studies were not used as direct evidence of tele-rehabilitation effectiveness. Instead, they helped explain why some older adults may accept,

struggle with or avoid remote rehabilitation services. This distinction was important because the main findings of the thesis needed to remain grounded in direct tele-rehabilitation evidence, while the contextual evidence helped explain wider user-related factors.

Methodological, background and institutional guidance sources were kept separate from the evidence categories. Sources on scoping review methodology, PRISMA-ScR reporting, JBI guidance, rehabilitation definitions and AI guidance were used only to support the method, definitions, background and reporting of the thesis. They were not included in the PRISMA eligibility count and were not counted as evidence studies in the results synthesis.

Table 3. Overview of evidence sources used in this thesis by category.

Category	**Sources**	**Role in thesis**
Direct-focus evidence	Shulver et al. (2017), Dawson et al. (2024), Seinsche et al. (2023), Gamble et al. (2024), Bernocchi et al. (2018), Khalil et al. (2024)	Main evidence base for results and interpretation
Contextual supporting evidence	Tan et al. (2025), Chen et al. (2024), Fleischer et al. (2025), Man et al. (2025), Tandon et al. (2024), Choi and Lee (2022)	Supports interpretation of usability, acceptance and digital readiness

This overview clarifies how each source contributed to the thesis and confirms that method, framework and background sources were kept separate from the evidence synthesis.

3.5 Quality Assessment

A quality assessment of the twelve included studies was conducted to consider the methodological characteristics and transparency of the evidence base. In scoping reviews, formal quality appraisal is not required in the same way as systematic reviews, because the purpose is to map the breadth of available evidence rather than to synthesize findings from high-quality studies only. However, JBI guidance recommends that the characteristics and quality of included sources are considered and reported transparently (JBI 2024; Tricco et al. 2018, p. 468).

The assessment used a ten-item checklist evaluating the following areas (Lockwood et al. 2015):

1. Philosophical congruity: alignment between philosophical perspective and methodology
2. Methodological congruity: alignment between methodology and research objectives
3. Data collection: appropriateness of methods used to gather data
4. Data representation: clarity and appropriateness of data analysis
5. Interpretation: accuracy of results in relation to the analysis
6. Researcher location: cultural or theoretical positioning of the authors
7. Reflexivity: discussion of the researcher's influence on the study
8. Participant representation: visibility and adequacy of participants' voices
9. Ethics: adherence to current ethical criteria and standards
10. Conclusion flow: logical progression from analysis to conclusions

To ensure consistency in the assessment, responses were converted into a numerical scale:

- A score of 4 (Good/Yes) was assigned when a study provided comprehensive evidence for a criterion

- A score of 3 (Fair) indicated that the criterion was met but lacked sufficient detail
- A score of 2 (Poor/Unclear) was given when the information was vague or difficult to determine
- A score of 1 (Very Poor/No) was assigned when the criterion was entirely absent
- For items that were not applicable, a neutral score of 2 was assigned to avoid skewing the quality ranking

The assessment was conducted by querying each study against the ten criteria using NotebookLM, and all outputs were verified against the original source articles before scores were recorded. The results are presented in Table 4.

Table 4. Quality assessment of included evidence studies.

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
Shulver et al. (2017)	4	4	4	4	4	3	2	4	4	4	37
Bernocchi et al. (2018)	4	4	4	4	4	3	2	4	4	4	37
Gamble et al. (2024)	4	4	4	4	4	3	2	4	4	4	37
Dawson et al. (2024)	4	4	4	4	4	4	4	4	4	4	40
Seinsche et al. (2023)	4	4	4	4	4	4	2	4	4	4	38
Khalil et al. (2024)	4	4	4	4	4	3	2	4	4	4	37
Man et al. (2025)	4	4	4	4	4	3	2	4	4	4	37

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total
Tan et al. (2025)	4	4	4	4	4	3	2	4	4	4	37
Chen et al. (2024)	4	4	4	4	4	3	2	4	4	4	37
Fleischer et al. (2025)	4	4	4	4	4	4	4	4	4	4	40
Tandon et al. (2024)	4	4	4	4	4	3	2	3	4	4	36
Choi and Lee (2022)	4	4	4	4	4	3	2	3	4	4	36
Average	4.00	4.00	4.00	4.00	4.00	3.33	2.33	3.83	4.00	4.00	37.50

Q1: Is there congruity between the stated philosophical perspective and the research methodology?

Q2: Is there congruity between the research methodology and the research objectives?

Q3: Is there congruity between the research methodology and the methods used to collect data?

Q4: Is there congruity between the research methodology and the representation and analysis of data?

Q5: Is there congruity between the research methodology and the interpretation of results?

Q6: Is there a statement locating the researcher culturally or theoretically?

Q7: Is the influence of the researcher on the research, and vice versa, addressed?

Q8: Are participants and their voices adequately represented?

Q9: Is the research ethical according to current criteria or for recent studies, is there evidence of ethical approval by an appropriate body?

Q10: Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?

The overall methodological quality of the twelve studies was high, with total scores ranging from 36 to 40 out of a maximum possible score of 40. No studies were excluded based on quality, as all met the required standard of methodological rigour. The characteristics and limitations of individual studies are discussed further in Chapter 4.

3.6 Data Extraction and Analysis

After screening, relevant information was collected from the 12 selected evidence studies using a structured data charting approach. In scoping reviews, this process is often called data charting because the aim is to organize key information from each source rather than combine results statistically. The charting table included author-year details, country, study design, participant group, intervention or technology, setting, reported outcomes, motivational elements, mental well-being-related elements, usability findings, barriers and relevance to the research questions. This supported consistent comparison across the selected studies (Arksey and O'Malley 2005; Levac et al. 2010; Tricco et al. 2018; JBI 2024).

The direct-focus tele-rehabilitation studies were charted as the main evidence for the results chapter. The contextual telehealth studies were also charted, but their role was marked separately from the direct-focus tele-rehabilitation studies. These contextual studies supported the interpretation of usability, technology acceptance, technology anxiety, digital literacy, subjective well-being, barriers and the roles of motivation and mental well-being among older adults using remote health technologies. They were not used to make direct claims about the clinical effectiveness of tele-rehabilitation.

The charted information was analysed using a descriptive thematic approach. First, relevant findings were read from each article and entered into the extraction table. Second, repeated ideas were labelled with simple codes such as convenience, professional support, self-awareness, enjoyment, quality of life, confidence, technology anxiety, digital literacy and usability barriers. Third,

related codes were grouped into broader themes. These themes were then used to organize the results chapter under motivation and engagement, mental well-being and quality of life, usability and acceptance, plus key gaps in the literature.

NotebookLM was used only as a support tool during the early organization of article notes. It helped compare uploaded articles, identify possible recurring ideas and prepare preliminary theme groupings. However, NotebookLM was not used as a scientific source. It did not make the final extraction decisions or final interpretation. The extracted data, theme selection, citations and final interpretation were checked manually against the original articles by the author.

ChatGPT was used to support language clarity, structure and reflection during writing. It was not used as the author of the thesis. The author remained responsible for the final academic content, source use, interpretation and conclusions. More detailed information about AI use is provided in Appendix 1.

A statistical meta-analysis was not used because the aim of this thesis was not to calculate a pooled treatment effect. The included evidence had different study designs, populations, technologies, settings and outcomes. Therefore, a descriptive thematic synthesis was more suitable for answering the research questions and mapping how motivation and mental well-being are addressed in tele-rehabilitation for elderly home users.

A summarized version of the data charting table is presented in Chapter 4.1 to show the main characteristics and relevance of the included evidence studies.

3.7 Ethical Considerations and Use of AI Tools

This thesis was based on previously published literature. It did not include interviews, surveys, patient data, clinical testing or direct contact with human participants. Therefore, separate ethical approval was not required. Ethical responsibility was still considered throughout the thesis process by using reliable

sources, reporting the review process transparently and citing sources accurately.

The review was conducted with respect for good scientific practice. The sources were selected, read and interpreted in relation to the research questions. Claims were not made beyond the evidence found in the selected studies. For example, contextual telehealth studies were not used as direct evidence of tele-rehabilitation effectiveness. They were used only to support the discussion of usability, acceptance and digital readiness among older adults.

AI tools were used as supportive tools during the thesis process. NotebookLM was used to support article familiarization, note organization and preliminary theme grouping. ChatGPT was used to support language clarity, structure and reflection during writing. These tools were not used as scientific sources. They did not make the final screening decisions, extraction decisions or interpretation of findings.

The author checked the extracted data, themes, citations and final interpretation against the original articles. The author remained responsible for the final academic content, source use, conclusions and ethical reporting. This follows Metropolia's guidance that AI may support planning or refinement, but it cannot be the author of a thesis. The student remains personally responsible for the content and for following good scientific practice (Metropolia University of Applied Sciences 2026.)

A more detailed AI use declaration is provided in Appendix 1.

4 Results and Interpretation

4.1 Characteristics of Included Studies

The main direct-focus evidence base of this thesis included six tele-rehabilitation studies. These studies were selected because they focused on tele-rehabilitation, telephysiotherapy or home-based rehabilitation for older adults. The studies used different research designs, including randomized controlled trials, qualitative interview studies, a systematic review and a usability study. This variety was suitable for a scoping review because the aim was to map the evidence rather than compare one intervention through statistical analysis.

A summarized data charting table was prepared to organize the main characteristics of the direct-focus studies. The table includes the study design, population, intervention focus and relevance to the research questions. This helps show how each direct-focus study contributed to the analysis.

Table 5. Characteristics of the direct-focus evidence studies.

Author and year	**Study design**	**Population and setting**	**Intervention or focus**	**Main relevance to this thesis**
Bernocchi et al. (2018)	Randomized controlled trial	Older patients with COPD and chronic heart failure in a home-based setting	Four-month home-based telerehabilitation with monitoring, nurse calls and physiotherapist-supported exercise	Shows how structured home telerehabilitation can support quality of life, satisfaction and regular motivational input

Dawson et al. (2024)	Qualitative interview study	Older adults, physiotherapists and aged care staff in home or aged care settings	TOP UP telephysiotherapy using Zoom, exercise videos and local support workers	Shows how tailored care, local support and older-adult-friendly resources may influence motivation and confidence
Gamble et al. (2024)	Systematic review	Community-dwelling older adults aged 65 years or above	Guided telerehabilitation using video, audio or text communication technologies	Provides broader evidence on guided telerehabilitation and functional performance among older adults
Khalil et al. (2024)	Randomized controlled trial	Older adults after coronary artery bypass grafting	Twelve-week home-based transitional cardiac telerehabilitation	Shows relevance to health-related quality of life, psychological functioning, therapeutic self-care and adherence
Seinsche et al. (2023)	Usability and technology acceptance study	Older adults and healthcare professionals	Exergame-based telerehabilitation system	Provides evidence on enjoyment, acceptance, usability, safety perception and technical barriers

Shulver et al. (2017)	Qualitative interview study	Older rehabilitation patients, spouses and one carer	Home telerehabilitation using iPads, video consultations and Fitbit devices	Shows how telerehabilitation may support motivation, self-awareness, therapeutic relationships and confidence

The direct-focus studies show that tele-rehabilitation for older adults is not only about the remote delivery of exercises. It also includes professional guidance, user confidence, technology acceptance, social connection, feedback, safety and practical support at home. These issues are closely connected to the research questions of this thesis.

The contextual supporting studies are not included in Table 5 because they do not directly examine tele-rehabilitation interventions. They are used later in the analysis to support the discussion of digital readiness, technology anxiety, usability, acceptance and barriers among older adults. This separation kept the main direct-focus evidence base clear and avoided treating contextual telehealth studies as direct evidence of tele-rehabilitation effectiveness.

Table 6 presents a summary of the data charting and initial coding applied to the twelve included evidence studies, showing the key finding used, the initial codes assigned and the broader theme each study was grouped under.

Table 6. Data charting summary: initial codes and themes assigned to included evidence studies.

No.	Study	Evidence role	Key findings used in thesis	Initial codes	Theme
1	Shulver et al. (2017)	Direct-focus tele-rehabilitation	Older participants experienced telerehabilitation as convenient and motivating.	Convenience, motivation, self-awareness, therapeutic	Motivation and engagement; mental well-being

			Therapeutic relationships, self-awareness and confidence were important.	relationship, confidence, support	
2	Bernocchi et al. (2018)	Direct-focus tele-rehabilitation	Structured home telerehabilitation with monitoring, weekly nurse calls and physiotherapist-supported exercise supported quality of life and engagement.	Routine contact, professional follow-up, remote monitoring, quality of life, adherence	Motivation and engagement; mental well-being
3	Gamble et al. (2024)	Direct-focus tele-rehabilitation	Guided telerehabilitation was presented as a promising alternative to in-person rehabilitation for older adults, mainly focused on functional outcomes.	Functional performance, guided support, access, physical outcomes, limited psychological focus	Background to results; research gap
4	Dawson et al. (2024)	Direct-focus tele-rehabilitation	Motivation was strengthened by tailored physiotherapy, local support, older-adult-friendly resources and companionable coaching.	Tailored care, local support, autonomy, confidence, motivation, older-adult-friendly resources	Motivation and engagement; supported process
5	Seinsche et al. (2023)	Direct-focus tele-rehabilitation	Exergame-based telerehabilitation showed good acceptance, high enjoyment and usability issues. Enjoyment was closely linked to motivation.	Enjoyment, acceptance, usability, safety perception, technical barriers, intrinsic motivation	Motivation and engagement; usability and acceptance
6	Khalil et al. (2024)	Direct-focus tele-rehabilitation	Home-based cardiac telerehabilitation improved HRQoL and therapeutic self-care. High adherence suggested engagement.	Quality of life, self-care, adherence, feedback, flexibility, engagement	Mental well-being; motivation and engagement
7	Tan et al. (2025)	Contextual supporting evidence	Subjective well-being influenced older adults' intention to adopt telehealth.	Subjective well-being, perceived usefulness, attitude, intention, readiness	Digital readiness; mental well-being context
8	Chen et al. (2024)	Contextual supporting evidence	Technology anxiety was linked to lower intention to use digital health technologies.	Technology anxiety, intention to use, facilitating conditions, digital confidence	Digital readiness; barriers

9	Fleischer et al. (2025)	Contextual supporting evidence	Preparedness, receptiveness and willingness shaped older adults' telehealth readiness.	Preparedness, receptiveness, willingness, readiness, confidence	Digital readiness; acceptance
10	Man et al. (2025)	Contextual supporting evidence	Older adults described barriers related to digital literacy, access to devices and preference for in-person care.	Digital literacy, device access, human contact, exclusion, telehealth barriers	Usability and acceptance; social barriers
11	Tandon et al. (2024)	Contextual supporting evidence	Telehealth adoption was shaped by openness to change, reasons for use and reasons against use.	Openness to change, technology anxiety, personal inertia, social interaction, adoption behaviour	Acceptance; barriers
12	Choi and Lee (2022)	Contextual supporting evidence	Telehealth safety risks included technology literacy problems, economic issues and platform or service failures.	Technology literacy, economic barriers, platform failure, safety risk, support needs	Usability and acceptance; service risk

4.2 Motivation and Engagement Findings

Motivation appeared across the direct-focus studies, but it was rarely measured as a separate outcome. Instead, it was described through convenience, self-awareness, enjoyment, routine contact, local support and structured follow-up. Shulver et al. (2017) reported that older participants experienced telerehabilitation as convenient and motivating. Their thematic analysis also identified self-awareness and positive therapeutic relationships as part of the rehabilitation experience. This is important because it shows that motivation in older adults was linked not only to exercise completion, but also to feeling supported and staying aware of one’s own progress (Shulver et al. 2017, p. 120.)

Bernocchi et al. (2018) did not measure motivation directly, but the intervention combined remote monitoring, weekly nurse phone calls and physiotherapist-monitored exercise. Because of this structured follow-up, the study suggests that engagement may have been supported by routine contact and professional oversight rather than by technology alone (Bernocchi et al. 2018, pp. 82–84.)

Dawson et al. (2024) provided especially clear evidence on motivation. Their six themes included tailored physiotherapy care with local support, older-adult-friendly educational resources and expanded care opportunity. The study also stated that motivation to exercise was enhanced by Zoom's convenience, tailored web-based exercise resources, and companionable local support. This finding is highly relevant because it shows that motivation in telephysiotherapy was strengthened by human support and accessibility, not only by digital delivery (Dawson et al. 2024, p. 6.)

Khalil et al. (2024) showed that home-based transitional cardiac telerehabilitation improved health-related quality of life and therapeutic self-care. In addition, the study reported relatively low dropout rates, which suggests good ongoing engagement among participants who remained in the intervention. This is a useful indicator of programme acceptability, even though adherence alone should not be treated as a full explanation of motivation (Khalil et al. 2024, pp. 139, 142.)

Seinsche et al. (2023) showed that enjoyment was an important part of engagement. The exergame-based telerehabilitation system achieved good acceptance ratings and high enjoyment, which suggests that interactive formats may help some older adults remain engaged in rehabilitation tasks that might otherwise feel repetitive (Seinsche et al. 2023, p. 10.)

Overall, the reviewed evidence suggests that motivation in tele-rehabilitation is supported by routine contact, tailored care, enjoyment, clear structure and local help when needed. At the same time, motivation remains underdefined in the literature because it is usually inferred through related indicators rather than measured directly. The contextual supporting studies help explain why motivation may vary so much among elderly home users before they even begin a rehabilitation programme. Fleischer et al. (2025) found that older adults identified preparedness, receptiveness and willingness as the key factors shaping whether they intended to use telehealth. Those who felt psychologically unprepared or uncertain about using digital tools were less likely to engage regardless of clinical need. Chen et al. (2024) similarly found that technology anxiety was directly

linked to weaker intention to use digital health services among older adults with chronic conditions. For elderly home users, this means that the motivation to participate in remote rehabilitation can be reduced by digital uncertainty and lack of confidence barriers that rarely appear as measured outcomes in the direct-focus tele-rehabilitation studies but that influence engagement from the very start (Fleischer et al. 2025, p. 9; Chen et al. 2024, p. 1).

4.3 Mental Well-Being and Quality of Life Findings

Mental well-being was also rarely measured as a direct outcome. Instead, the literature described well-being through related outcomes such as quality of life, therapeutic self-care, confidence, support, therapeutic relationship and perceived safety.

Bernocchi et al. (2018) reported significant improvements in quality-of-life measures, disability and physical activity profile in the intervention group. The study also used the Physical Activity Scale for the Elderly (PASE) to assess physical activity profile, showing that activity-related outcomes were considered alongside quality of life and disability. These are not direct mental health outcomes, but they are relevant to well-being because improved daily functioning and quality of life can influence how older adults experience recovery at home (Bernocchi et al. 2018, pp. 82, 85.)

Khalil et al. (2024) provided direct evidence that home-based transitional cardiac telerehabilitation improved health-related quality of life and therapeutic self-care. The findings are relevant to mental well-being because quality of life and self-care reflect not only physical functioning but also confidence, coping and the ability to manage recovery in daily life (Khalil et al. 2024, p. 139.)

Shulver et al. (2017) showed that older participants experienced positive therapeutic relationships during telerehabilitation. This is an important well-being-related finding because emotional reassurance and trust in the therapist can

affect how safe and supported older adults feel while rehabilitating at home (Shulver et al. 2017, p. 120.)

Dawson et al. (2024) reported high levels of programme acceptability and described themes related to autonomy, older-adult-friendly resources and safe and acceptable telephysiotherapy. These findings suggest that mental well-being in tele-rehabilitation may be influenced by whether the service feels manageable, respectful and safe (Dawson et al. 2024, p. 7.)

Seinsche et al. (2023) contributed evidence on enjoyment, acceptance and usability. While these are not direct mental well-being outcomes, they help explain whether rehabilitation feels frustrating or positive from the user’s point of view. In older adults, this user experience can affect confidence and willingness to continue rehabilitation over time (Seinsche et al. 2023, p. 10.)

Gamble et al. (2024) helped frame these findings by showing that telerehabilitation can be a promising alternative to in-person care for improving functional performance in older adults. However, the review did not focus primarily on mental well-being outcomes, which reinforces the point that psychological aspects are still secondary in much of the field (Gamble et al. 2024, p. 457.)

The contextual supporting studies also shed light on the well-being dimension of remote care. Tan et al. (2025) found that subjective well-being was the single most important factor influencing older adults' intention to adopt telehealth services, carrying more weight than perceived usefulness or ease of use. This matters for tele-rehabilitation because it suggests that how an older adult feels about their own life and health in their sense of daily comfort while independence directly affects their readiness to engage with remote care. Man et al. (2025) found that older adults who faced barriers related to digital access and limited health literacy reported feeling excluded from telehealth, reflecting a well-being impact that goes beyond clinical measurement. Together these findings show that mental well-being in tele-rehabilitation is shaped not only by what happens

during a programme, but also by the user's confidence, access and sense of readiness before it begins. Quality of life, therapeutic self-care, therapeutic relationship, perceived support, safety experience and digital confidence were the most relevant indicators across the reviewed evidence, and none of them represent a direct measure of mental health (Tan et al. 2025, p. 1; Man et al. 2025, p. 256).

4.4 Usability and Acceptance Findings

Usability and acceptance were central findings across the evidence base because tele-rehabilitation can only work when the user understands the technology and feels able to use it in daily life. Seinsche et al. (2023) reported good acceptance ratings among older adults and health professionals and high enjoyment during the exergame session. At the same time, the study identified common barriers, including movement-recognition sensitivity, limited markings on the device and difficulty understanding some instructions. This shows that a system may be promising while still needing practical design improvements for elderly home use (Seinsche et al. 2023, p. 10.)

Dawson et al. (2024) reported high acceptability for the TOP UP programme across older adults, physiotherapists and aged care staff. Their findings also showed that telephysiotherapy was more workable when local support and older-adult-friendly resources were available. This is important because usability in geriatric tele-rehabilitation often depends on the wider care environment, not only on interface design (Dawson et al. 2024, p. 10.)

Shulver et al. (2017) reported that participants coped well with the technology and viewed telerehabilitation positively, but also stressed that it should not replace face-to-face care completely. This suggests that acceptance is influenced by how the service is positioned. Older adults may accept remote rehabilitation more readily when it is offered as a complement to in-person care (Shulver et al. 2017, p. 120.)

Bernocchi et al. (2018) reported very high patient satisfaction with the programme. This strengthens the argument that structured home-based telerehabilitation can be acceptable in older patients when it is supported through regular contact and suitable monitoring (Bernocchi et al. 2018, p. 84.)

The six contextual supporting studies, Fleischer et al. (2025), Chen et al. (2024), Tan et al. (2025), Tandon et al. (2024), Man et al. (2025) and Choi and Lee (2022), provide additional explanation for why usability and acceptance may differ across older adults. These studies did not examine tele-rehabilitation directly, but they addressed factors that shape older adults' readiness and willingness to use remote health technologies. Fleischer et al. (2025) identified three broad readiness themes: preparedness, receptiveness and willingness. These themes influenced whether older adults intended to use telehealth. Chen et al. (2024) reported that technology anxiety was associated with lower intention to use digital health technologies among older adults, while stronger facilitating conditions helped reduce that anxiety. Tan et al. (2025) found that telehealth intention was linked especially to subjective well-being, attitude, transition cost and perceived usefulness. Tandon et al. (2024) further showed that openness to change together with reasons for and reasons against telehealth shaped older adults' adoption behaviour

Man et al. found that many older adults had limited understanding of telehealth and described barriers related to digital literacy, access to suitable devices and preference for in-person care (Man et al. 2025, p. 256). Choi and Lee examined telehealth safety risks among low-income older adults and identified risk clusters related to technology literacy, economic constraints and service or platform failures (Choi and Lee 2022, pp. 3–5). Although Choi and Lee's study was not a tele-rehabilitation study, it highlights practical barriers that can also affect remote care delivery for older adults.

Overall, the evidence suggests that usability and acceptance are not separate from rehabilitation outcomes. They are part of the rehabilitation experience itself. Clear instructions, technical reliability, appropriate support and human contact,

all shape whether tele-rehabilitation feels manageable and worthwhile for older adults.

4.5 Summary of Findings and Gaps

The analysis of the twelve included studies identified the following specific gaps in how mental well-being and motivation are addressed in tele-rehabilitation for elderly home users. The first gap was that mental well-being was rarely measured as a direct outcome. Instead, studies tend to report related outcomes such as quality of life, self-care, therapeutic relationship, acceptability and confidence.

The second gap was that motivation was rarely defined or measured on its own. It is usually inferred from enjoyment, adherence, routine contact or participation. These findings are useful, but they do not fully explain what helps older adults begin, sustain or stop home-based rehabilitation.

The third gap concerned long-term engagement. Some studies reported good short-term adherence and low dropout rates, but much less is known about whether older adults continue rehabilitation habits after a programme ends.

The fourth gap concerned digital readiness. Contextual studies showed that technology anxiety, weak digital literacy, device access problems, economic barriers and preference for face-to-face care can affect remote care use in older adults. These factors are highly relevant to tele-rehabilitation, but they are not always studied directly inside tele-rehabilitation trials.

These gaps speak directly to the second sub-question of this thesis, which asked what challenges and gaps exist in the literature regarding mental well-being and motivation in tele-rehabilitation for elderly home users. The answer the evidence provides is that both concepts are present across the reviewed studies but are rarely treated as primary outcomes. Because they appear across different study designs, intervention types and outcome categories, it is difficult to draw a clear or consistent picture of how tele-rehabilitation addresses the emotional and

motivational needs of elderly home users. This scattered and indirect pattern of evidence is the central finding of the scoping review and sets the basis for the discussion in Chapter 5.

5 Discussions

5.1 Overview and Interpretations of Findings

This thesis explored how mental well-being and motivation are addressed in tele-rehabilitation for elderly home users. The main finding was that both concepts were present in the literature, but they were usually addressed indirectly. The direct-focus studies mainly reported functional performance, quality of life, therapeutic self-care, usability, satisfaction, enjoyment, self-awareness, or acceptability rather than direct measures of mental well-being or motivation (Gamble et al. 2024, p. 457; Bernocchi et al. 2018, p. 82; Khalil et al. 2024, p. 139; Seinsche et al. 2023, p. 10).

A second main finding was that tele-rehabilitation worked best when it was supported rather than purely delivered at a distance. Across the reviewed studies, older adults benefited when rehabilitation included routine contact, tailored guidance, older-adult-friendly resources, and help in the home setting. This was visible in the structured weekly support reported by Bernocchi et al. (2018, p. 82), the local support highlighted by Dawson et al. (2024, p. 6), and the positive therapeutic relationship described by Shulver et al. (2017, p. 120).

The third main finding was that usability and acceptance were not secondary issues. They are central conditions for meaningful participation. The reviewed evidence showed that older adults can accept tele-rehabilitation well, but barriers remain. Technology anxiety, limited digital literacy, poor device access, and preference for face-to-face care may weaken engagement if the service is not designed carefully (Seinsche et al. 2023, p. 1; Fleischer et al. 2025, p. 9; Chen et al. 2024, p. 1; Man et al. 2025, p. 256).

In many tele-rehabilitation studies, mental well-being and motivation are not measured as direct outcomes. Instead, they appear through related findings such as quality of life, therapeutic self-care, confidence, enjoyment, satisfaction, adherence, usability or user experience. These outcomes can provide useful

information about the emotional and motivational side of rehabilitation. However, they should be interpreted carefully. Improved quality of life or high adherence may suggest a positive rehabilitation experience, but these outcomes should not automatically be described as direct evidence of improved mental health (Bernocchi et al. 2018, pp. 82–84; Khalil et al. 2024, pp. 139–140; Seinsche et al. 2023, p. 10).

5.2 Interpretation in Relation to the Research Questions

The main research question asked: *How are mental well-being and motivation addressed in tele-rehabilitation for elderly home users?* This review found that mental well-being and motivation were addressed mostly in an indirect way. Studies do not always use these exact terms as primary outcomes. However, they report related findings such as quality of life, psychological functioning, therapeutic self-care, confidence, independence, social isolation, enjoyment, adherence and feeling supported. These findings showed that mental well-being and motivation were part of tele-rehabilitation, even when they were not always measured separately (Bernocchi et al. 2018, p. 84; Khalil et al. 2024, p. 146; Dawson et al. 2024, p. 7; Shulver et al. 2017, p. 125).

The first sub-question asked*: What motivational and emotional outcomes are reported in existing studies on tele-rehabilitation for elderly users?* The review found that motivation was supported by regular professional contact, scheduled follow-up, activity monitoring, feedback, enjoyable activities and local support. For example, scheduled video contact encouraged participants to keep going because they expected to discuss their progress. Exergame enjoyment increased motivation, and high adherence in cardiac telerehabilitation suggested strong engagement with the programme. These findings showed that motivation was linked to structure, feedback, enjoyment and the feeling that someone was following the user’s progress (Shulver et al. 2017, p. 123; Seinsche et al. 2023, p. 10; Khalil et al. 2024, p. 143; Bernocchi et al. 2018, p. 85).

The same sub-question also asked about emotional outcomes. The review found that emotional well-being was connected to confidence, social contact, feeling capable, feeling supported and quality of life. Some studies reported improvements in quality of life or psychological functioning. Other studies described participants as happier, more confident, less socially isolated or more independent. These were not always direct mental health outcomes, but they were important well-being-related findings for elderly home users (Bernocchi et al. 2018, p. 84; Khalil et al. 2024, p. 139; Dawson et al. 2024, p. 7; Shulver et al. 2017, p. 125).

The second sub-question asked*: What challenges and gaps are identified in the literature regarding mental well-being and motivation in tele-rehabilitation for elderly users?* The main challenge is that tele-rehabilitation depends on digital readiness as well as healthcare support. Older adults may experience technology anxiety, poor digital literacy, lack of suitable devices, internet cost, usability problems and preference for face-to-face contact. These barriers can affect motivation because a user may lose confidence or stop participating if the technology feels difficult, stressful or unsupported (Chen et al. 2024, p. 1; Man et al. 2025, pp. 257–261; Tan et al. 2025, pp. 1–2; Tandon et al. 2024, p. 9).

Overall, the research questions were answered. The evidence showed that mental well-being and motivation were present in tele-rehabilitation studies, but they were often hidden inside broader outcomes such as quality of life, adherence, confidence, enjoyment and user experience. This was the main interpretation of the review. Tele-rehabilitation can support elderly home users, but its success depends on both clinical content and human-centred support.

5.3 Tele-Rehabilitation as a Supported Process

The findings of this thesis suggest that tele-rehabilitation for elderly home users should be understood as a supported process rather than a purely technical service. Across the reviewed studies, the older adults who benefited most from remote rehabilitation were those who received structured human support

alongside the technology. This distinction is important because it shifts the understanding of tele-rehabilitation from a delivery mechanism to a care relationship that happens to use digital tools.

Shulver et al. (2017) noted that telehealth technologies have been promoted as a solution to the challenges created by an ageing population with long-term complex healthcare needs, offering cost-effective, quality and flexible care. However, the same study showed that older participants experienced telerehabilitation as complementary to face-to-face care rather than a replacement for it. Participants valued the therapeutic relationship with their clinician and described this connection as central to feeling supported and motivated during rehabilitation (Shulver et al. 2017, pp. 120–121). This finding challenges a technology-first approach to remote rehabilitation and points instead to the importance of designing services where human contact is preserved and strengthened.

Dawson et al. (2024) reinforced this argument through the TOP UP telephysiotherapy programme, which was co-designed using the COM-B model and Self-Determination Theory to support behaviour change in older adults. The programme demonstrated that motivation and engagement were not products of the technology alone. They emerged from the combination of tailored physiotherapy care, companionable local support and older-adult-friendly resources. The study concluded that sustained organisational commitment, staff training and investment in local support workers were essential conditions for telephysiotherapy to work in practice. (Dawson et al. 2024, pp. 11–12.) This has direct implications for how tele-rehabilitation services are planned and resourced, not only for how they are designed technically.

The broader healthcare context also supports this argument. Khalil et al. (2024) showed that home-based transitional cardiac telerehabilitation was effective in improving health-related quality of life and therapeutic self-care, and called for advocacy around policy changes and reimbursement models that support telerehabilitation integration into standard care. The study also emphasised that

optimal outcomes depended on key pillars including health education, family involvement, shared decision-making and patient-centred approaches not on technology alone. (Khalil et al. 2024, p. 147.) From a healthcare systems perspective, this means that tele-rehabilitation needs policy support, professional training and infrastructure investment alongside technical development.

The risk of treating tele-rehabilitation as a purely technical solution is illustrated clearly by Choi and Lee (2022), who analysed failure modes in a telehealth service for low-income older adults. Their findings identified three major risk clusters: oblivescence, economic issues and technology literacy problems. The study showed that platform instability, insufficient financial resources and users forgetting how to operate the system were among the highest-ranked risk factors. These risks were not technology failures in a narrow sense. They reflected the gap between what the system required and what the users were able to manage in their real home situations. (Choi and Lee 2022, p. 4.) Addressing these risks required organisational responses such as repeated education, government policy support and platform stabilisation, which reinforces the argument that tele-rehabilitation cannot succeed through technology design alone.

From an information technology and medical technology perspective, these findings point to a clear design requirement. Tele-rehabilitation systems for elderly home users need to be built around the realistic capabilities, constraints and emotional states of their users. Seinsche et al. (2023) demonstrated the importance of user-centred design in this context, describing how the COCARE exergame system was developed through an iterative process involving older adults and healthcare professionals as end users at every stage. The study emphasised that usability, acceptance, enjoyment and safety are not optional features but essential components of a system that elderly users can genuinely engage with at home. (Seinsche et al. 2023, pp. 1–2.) This approach to grounding system development in the lived experience of the target user group represents the most important engineering contribution that tele-rehabilitation development currently needs.

The evidence reviewed in this thesis points to a model of tele-rehabilitation that combines clinical rehabilitation content, accessible and reliable technology and sustained human support. These three elements depend on each other. If professional guidance is missing, the user may feel abandoned even when the technology works well. If the technology is difficult to use, the user may lose confidence even when clinical support is available. If emotional reassurance is absent, participation may still weaken over time. Tele-rehabilitation for elderly home users therefore needs all three elements to work together and to be adapted to the individual's situation.

5.4 Implications for Technology Design

For healthcare professionals, the findings suggest that tele-rehabilitation should include regular guidance, encouragement and follow-up. Older adults may benefit from remote care, but they may still need reassurance, personal contact and a clear therapeutic relationship. Remote care should therefore not remove the human side of rehabilitation. Instead, it should create new ways to maintain support between the professional and the older adult (Shulver et al. 2017, p. 123; Dawson et al. 2024, p. 11).

For service planners, the findings suggest that tele-rehabilitation should not be designed as a technology-only model. Some older adults may need local support workers, family members or caregivers to help with device setup, video calls and exercise safety. This is especially important when users have low digital confidence, physical limitations or safety concerns at home (Dawson et al. 2024, p. 8; Gamble et al. 2024 pp. 472–473).

For technology developers, the findings suggest the need for simple and older-adult-friendly design. Usability problems such as small screens, small icons, poor contrast, difficult device positioning and movement-recognition problems can reduce confidence and participation. Tele-rehabilitation systems should therefore be easy to set up, easy to see, easy to understand and reliable during home use

(Dawson et al. 2024, p. 12; Shulver et al. 2017, p. 124; Seinsche et al. 2023, p. 10).

The findings also suggest that emotional readiness should be considered before and during tele-rehabilitation. A user may have access to technology but still feel anxious, unsure or unwilling to use it. Contextual telehealth studies show that subjective well-being, perceived usefulness, trust, technology anxiety and preference for human interaction can influence older adults' willingness to use remote care. These studies do not prove tele-rehabilitation effectiveness, but they help explain why acceptance and motivation may vary among elderly users (Tan et al. 2025, pp. 1–2; Chen et al. 2024, p. 1; Tandon et al. 2024, p. 9; Man et al. 2025, pp. 256–261).

The findings also suggest that tele-rehabilitation should be developed with the real home situation of older adults in mind. Some elderly home users may live alone or may not have continuous family support. This means that remote rehabilitation cannot depend only on the presence of family members or caregivers. The service should include clear professional guidance, simple technology, technical support and motivational follow-up. If the professional only appears online for a short session and then leaves the user alone with the programme, some older adults may lose motivation or confidence. Therefore, healthcare professionals, service planners and technology developers should consider motivation, engagement, mental well-being and adherence as part of tele-rehabilitation design, not as extra issues outside the rehabilitation process (Shulver et al. 2017, pp. 123–125; Dawson et al. 2024, pp. 7–8; Seinsche et al. 2023, p. 10; Man et al. 2025, pp. 257–261).

5.5 Limitations

This thesis had some methodological limitations. Discussing limitations is part of transparent scoping review reporting because PRISMA-ScR asks authors to discuss the limitations of the review process. JBI guidance also emphasizes clear

reporting of the search strategy, data charting and presentation of results (Tricco et al. 2018; JBI 2024).

The first limitation was related to the search process. PubMed was the main database used during the first stage of the search. This database is suitable for medical, health and rehabilitation research, but it may not include all relevant studies from fields such as social care, digital health technology or human-computer interaction. The review also used mainly English-language literature, which means that some relevant studies published in other languages may not have been included. To reduce this limitation, additional studies were identified through reference checking and topic-based searching.

The second limitation was related to the number of direct-focus tele-rehabilitation studies. Only a small number of studies matched the full focus of the thesis. Therefore, the findings should be understood as a mapping of available evidence rather than a complete evaluation of all tele-rehabilitation research. The purpose of the thesis was not to prove effectiveness, but to identify how motivation and mental well-being are addressed in the existing literature.

The third limitation was related to the use of contextual supporting studies. Some studies included in the thesis focused on telehealth adoption or digital health use rather than tele-rehabilitation itself. These studies were useful for understanding technology acceptance, digital readiness and barriers among older adults. However, they were not used as direct evidence of tele-rehabilitation effectiveness. This distinction is important because telehealth adoption studies can explain why older adults may accept or reject remote care, but they cannot replace direct tele-rehabilitation evidence (Tan et al. 2025, pp. 1–2; Chen et al. 2024, p. 1; Fleischer et al. 2025, p. 9; Man et al. 2025, pp. 256–261; Tandon et al. 2024, p. 9).

The fourth limitation was related to variation between the included studies. The selected studies used different designs, populations, interventions, technologies, settings and outcomes. Because of this variation, the results could not be

combined statistically. A descriptive thematic synthesis was used instead, which was more suitable for the aim of a scoping review.

The fifth limitation was related to interpretation. Motivation and mental well-being were not always measured as direct outcomes in the selected studies. In some articles, these concepts appeared indirectly through findings related to quality of life, self-care, confidence, enjoyment, adherence, usability or user experience. This means the findings must be interpreted carefully. Improved quality of life or high adherence may suggest a positive rehabilitation experience, but they do not automatically prove a direct improvement in mental well-being or motivation.

AI tools were used only to support article familiarization, organization of notes and language clarity. This may create a risk of over-reliance on tool-generated summaries. To reduce this risk, the final extraction, coding, citations and interpretation were checked manually against the original articles by the author. This follows Metropolia's guidance that AI may support thesis work, but the student remains responsible for the final content and good scientific practice (Metropolia University of Applied Sciences 2026.)

These limitations do not remove the value of the thesis. Instead, they clarify the scope of the review and support transparent reporting. The findings should be understood as a structured overview of current evidence and gaps rather than as final clinical recommendations.

5.6 Future Research and Development Needs

Future research should study mental well-being and motivation more directly in elderly tele-rehabilitation users. Many existing studies report physical outcomes, quality of life, adherence or usability, but fewer studies focus clearly on emotional experience, motivation, confidence, loneliness, anxiety, therapeutic relationship or long-term engagement. These outcomes should be studied more directly to better understand the psychological side of tele-rehabilitation (Gamble et al.

2024, p. 457; Bernocchi et al. 2018, p. 84; Khalil et al. 2024, p. 139; Dawson et al. 2024, p. 7).

There is also a need for longer follow-up studies. Some programmes show good adherence during the intervention period, but it is less clear whether motivation continues after the programme ends. Future research should examine how older adults maintain rehabilitation habits over time and what kind of support helps them continue when regular professional contact decreases (Khalil et al. 2024, p. 143; Shulver et al. 2017, p. 123; Seinsche et al. 2023, p. 10).

More research is needed on older adults with low digital confidence. The contextual evidence shows that technology anxiety, poor digital literacy, device access and preference for human contact can affect telehealth use. Future tele-rehabilitation studies should include older adults with different digital skills, different home situations and different levels of support. This would help show whether tele-rehabilitation is accessible to a wider group of elderly users, not only to those who are already comfortable with technology (Chen et al. 2024, p. 1; Man et al. 2025, pp. 257–261; Fleischer et al. 2025, p. 9; Tandon et al. 2024, p. 9).

Future development should also focus on practical design and support. Tele-rehabilitation systems should use clear instructions, readable text, simple navigation, reliable feedback and easy setup. Programmes should also include technical support, caregiver involvement or local support workers when needed. These elements are important because usability problems can affect safety, confidence and motivation (Dawson et al. 2024, pp. 8, 12; Shulver et al. 2017, p. 124; Seinsche et al. 2023, p. 1; Gamble et al. 2024 pp. 472–473).

6 Summary

6.1 Summary of the Study

This thesis explored how mental well-being and motivation were addressed in tele-rehabilitation for elderly home users. The study was carried out as a scoping review. The purpose was not to test a new intervention or collect new participant data. Instead, the aim was to map existing literature and understand how motivation, emotional well-being, usability, acceptance and barriers were discussed in relation to older adults using tele-rehabilitation at home.

The review showed that mental well-being and motivation were present in the literature, but they were often addressed indirectly. Mental well-being was mainly connected to quality of life, therapeutic self-care, confidence, independence, social connection and the feeling of being supported. Motivation was mainly connected to adherence, scheduled contact, feedback, enjoyment, self-monitoring and professional encouragement. These findings showed that tele-rehabilitation was not only about the remote delivery of exercises. It also involved emotional support, human contact and user confidence (Bernocchi et al. 2018, p. 84; Khalil et al. 2024, pp. 139, 146; Shulver et al. 2017, pp. 123–125; Dawson et al. 2024, p. 7).

The review also showed that usability and digital readiness were important for elderly home users. Older adults may benefit from tele-rehabilitation, but they may also face barriers such as technology anxiety, low digital literacy, lack of suitable devices, internet cost, usability problems and preference for face-to-face contact. These barriers can affect participation and motivation. Therefore, tele-rehabilitation should be designed with simple technology, clear instructions, reliable support and human guidance (Chen et al. 2024, p. 1; Man et al. 2025, pp. 257–261; Dawson et al. 2024, pp. 8, 12; Seinsche et al. 2023, p. 1).

Overall, the thesis answered the research questions by showing that mental well-being and motivation are relevant in tele-rehabilitation for elderly users, but they need more direct attention in future research. The findings suggest that

successful tele-rehabilitation should combine clinical rehabilitation, accessible technology, professional support and emotional reassurance.

6.2 Personal Reflections and Learning

Writing this thesis was a real learning process for me. At the beginning, I thought my focus was clear, but later I understood that it was actually going in too many directions. I changed my research question four or five times before it became specific enough to work with. Every time the question changed, the whole direction of the thesis also changed. Because of that, I learned something important through experience. A clear research question is the base of the whole thesis. Without that, it becomes difficult to decide what to include, what to leave out, or where the discussion should go. The guidance from my supervisors was very important during this process.

Understanding the scoping review method also took time. At first, it was not easy for me to separate the main evidence from the supporting background literature. I also had to learn how to use the PCC framework, how the PRISMA diagram works, plus how data charting should be done. These things became clearer only when I started doing them myself. While charting data from twelve sources, I noticed how spread out the evidence on motivation and mental well-being in tele-rehabilitation really is. I did not expect this in the beginning. It became clear only after reading the articles one by one. That made it feel like a real finding for me, not just something I had already assumed.

My interest in this topic also comes from my own life. Health and mental well-being have always been important to me. I try to stay physically active, do yoga in nature, plus take care of my mental health in my daily life. From my own experience, I know how important motivation is when trying to keep a healthy routine. I also know how quickly motivation can disappear when there is no support or encouragement. So when I read about elderly home users struggling to stay engaged in rehabilitation, I could understand the problem more personally. Motivation is fragile. Even a good rehabilitation programme can fail when the user

does not feel supported. This topic also felt close to me because of my connection with elderly people. I grew up with my grandmother, so I have always had a special feeling for older people. I have seen how they can be full of life experience but at the same time they can also feel vulnerable. That is why they deserve real care, patience, plus understanding. Reading about elderly home users who feel isolated, confused by technology, or unsupported during recovery did not feel like just normal research to me. It reminded me why this topic matters. Tele-rehabilitation should not only be technically useful. It should also feel safe, encouraging, simple, plus human for the people using it.

From my engineering and information technology background, a few points stood out clearly. Seinsche et al. (2023) showed that enjoyment had the strongest connection to motivation among the measured factors. For me, this was interesting from a design point of view. It suggests that game design ideas like clear goals, quick feedback, progress tracking and small rewards could help elderly users stay motivated. These features could make a difference between someone completing a programme or giving up halfway. Another thing I noticed was that none of the reviewed studies used artificial intelligence in a meaningful way. At the same time, many of the problems they discussed are areas where AI could help. For example, AI could support users when their motivation drops, notice early signs of disengagement or give more personalised encouragement. Several studies also reported good adherence during the intervention period but they did not say much about what happened after the programme ended. In my opinion, this is an important issue. A system that works only when users are being monitored is not fully successful. The real challenge is to design tele-rehabilitation systems that elderly users can continue using independently in the long term. This thesis helped me understand that gap more clearly, plus it showed me why future development should take motivation, mental well-being, and long-term support more seriously.

6.3 Conclusion

This thesis found that mental well-being and motivation were addressed in tele-rehabilitation for elderly home users, but often only indirectly. Motivation appeared through adherence, scheduled contact, feedback, enjoyment, self-monitoring and encouragement. Mental well-being appeared through quality of life, therapeutic self-care, confidence, social connection, independence, safety perception and therapeutic relationships (Bernocchi et al. 2018, p. 84; Khalil et al. 2024, pp. 139, 146; Shulver et al. 2017, pp. 123–125; Dawson et al. 2024, p. 7; Seinsche et al. 2023, p. 10).

The review also found that digital barriers remain important. Technology anxiety, low digital literacy, device access, internet cost, usability problems and preference for face-to-face contact can affect whether older adults feel ready to use tele-rehabilitation. Therefore, tele-rehabilitation should not be seen only as the remote delivery of exercises. It should be seen as a supported care process that combines clinical guidance, accessible technology and human connection (Chen et al. 2024, p. 1; Man et al. 2025, pp. 257–261; Tan et al. 2025, pp. 1–2; Tandon et al. 2024, p. 9; Dawson et al. 2024, pp. 7–8).

Overall, the review answered the research questions by showing that tele-rehabilitation can support elderly home users when motivation, emotional comfort, usability and support are considered together. Future research should measure mental well-being and motivation more directly and should include older adults with different levels of digital confidence and support needs. This would help tele-rehabilitation become more accessible, acceptable and meaningful for elderly users at home.

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Appendix 1: AI Use Declaration

In accordance with the principles of academic integrity and scholarly transparency, the author declares the following use of artificial intelligence tools during the preparation of this thesis.

AI Tools Used

The following AI tools were used as support tools during the research and writing process:

- ChatGPT by OpenAI
- NotebookLM by Google

These tools were used to support language clarity, text organisation, brainstorming, article understanding and the development of a clearer structure for the thesis. The tools were not used as independent academic sources.

Scope of AI Assistance

AI tools were used for the following purposes:

Language support and translation:
ChatGPT was used to translate selected text, improve sentence structure and support clearer academic expression in English. The author reviewed, edited and accepted responsibility for the final wording.

Brainstorming and structural organisation:
ChatGPT was used to brainstorm ideas, organise sections of the thesis and understand how different parts of the report could be connected logically. This included support in improving the clarity, flow and thematic organisation of the text.

Understanding article patterns and themes:
NotebookLM was used to support the understanding of patterns across selected articles. The author uploaded the articles separately into NotebookLM. First, the six core articles were uploaded and reviewed. Later, six contextual articles were uploaded to support the background and discussion sections.

Source-supported text suggestions:
NotebookLM was used to generate source-based summaries and citation-supported suggestions from the uploaded articles. These outputs were used only as working material. The author later checked the meaning against the original articles, paraphrased the content and decided how the information should be used in the thesis.

Chatgpt was used for generating Prisma Diagram.
Clarity and flow of themes:

AI tools were used to help organise themes related to tele-rehabilitation, elderly home users, motivation, adherence and mental well-being. The final interpretation of themes and their relevance to the thesis research questions was made by the author.

Example Prompt Used in NotebookLM

The following type of prompt was used in NotebookLM to support article understanding and theme organisation:

“I am writing a master’s thesis using a scoping review approach. My topic is tele-rehabilitation for elderly home users, with a focus on mental well-being and motivation. Please analyse the uploaded articles and identify the main themes related to motivation, adherence, emotional support, mental well-being, user engagement, challenges and gaps. Give source-supported points from the uploaded articles and indicate where the evidence appears in the article when possible. Do not create unsupported claims. Help me understand how these findings can be organised under my thesis research questions.”

A similar prompt was used separately for the six core articles and the six contextual articles. The AI-generated outputs were used as support for understanding and organising the material, not as final thesis text.

What AI Was Not Used For

AI was not used to independently conduct the scoping review, make final article selection decisions, create research findings or replace the author’s critical reading of the articles. AI was not used as a final authority for citations, page numbers or references. All citations, page numbers and reference details included in the thesis were checked and accepted by the author based on the original sources. The research topic, research questions, inclusion and exclusion decisions, interpretation of findings and final conclusions are the author’s own academic work.

Author’s Declaration

I, Raihan Noor, declare that all AI-assisted content used during the preparation of this thesis has been reviewed, edited and verified by me. I take full responsibility for the final content, academic interpretation, citations, references and conclusions presented in this thesis.

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