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Experiences of providing nutritional care and
collaborating with the nutrition support team: a
qualitative study among hospital doctors and nurses

Master's Thesis (34 ECTS)

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Experiences of providing nutritional care and collaborating with the nutrition support team: a qualitative study among hospital doctors and nurses

Summary

This qualitative cross-sectional study explored physicians' and nurses' experiences with providing nutritional care and their collaboration with the nutrition support team in the Estonian hospital context. The participants were from Internal Medicine Clinics (n=17) and Anaesthesiology and Intensive Care Clinics (n=14) at Tartu University Hospital, who completed a web-based, self-administered and open-ended questionnaire during January 2025. The data was analysed using a descriptive qualitative thematic analysis inductive approach. Three key themes were identified: nutritional screening and assessment practice, collaboration with the nutrition support team, and roles and perspectives of health professionals in nutritional care. The study findings provide insights into hospital nutritional care by identifying areas for improvement. This study concluded the need to increase the awareness of the nutrition support team among hospital staff and to implement routine nutritional screening aligned with international guidelines. Targeted training programs for doctors and nurses, and increasing nurses' involvement in nutritional care, can foster teamwork and support early identification and improved management of malnutrition in hospital settings.

Keywords: Clinical nutrition, nutrition support team, multidisciplinary collaboration, healthcare professionals' experiences

CERCS: B685 Hospital science and management

Haiglas töötavate arstide ja õdede kogemused toitmisravi ja koostöö osas toitmise tugimeeskonnaga: kvalitatiivne uuring

Lühikokkuvõte

Käesolev kvalitatiivne läbilõikeline uuring käsitles arstide ja õdede kogemusi haiglaravil viibivatele patsientidele toitmisravi pakkumisel ning koostööd toitmisravi tugimeeskonnaga. Uuringus osalesid Tartu Ülikooli Kliinikumi sisehaiguste kliiniku (n=17) ja anestesioloogia ning intensiivravi kliiniku (n=14) arstid ja õed, kes täitsid 2025. aasta jaanuaris avatud küsimustega veebipõhise küsimustiku. Andmete analüüsimisel kasutati induktiivset kvalitatiivset kirjeldavat temaatilist analüüsi. Analüüsil ilmnemise kolm põhiteemat: patsiendi toitumise hindamise ja sõelumise praktika, koostöö toitmisravi tugimeeskonnaga ning tervishoiutöötajate rollid ja vaated toitmisravile. Uuringu tulemused annavad ülevaate haiglas viibivate patsientide toitumise korraldusest ning toovad esile võimalikud arendusvaldkonnad. Uuringu põhijäreldused olid, et haiglapersonali teadlikkust toitmisravi meeskonna kaasamisest võiks suurendada ning tervishoiutöötajad peaksid tõhustama oma patsientide regulaarset hindamist toitumise osas. Viimast soovitavad ka mitmed rahvusvahelised juhised. Arstidele ja õdedele suunatud sihipärased koolitusprogrammid, õdede suurem kaasatus toitumise hindamisse ja tõhusam meeskonnatöö toetavad alatoitumuse varasemat avastamist ja tõhusamat käsitlust.

Võtmesõnad: kliiniline toitmine, toitmise tugimeeskond, multidistsiplinaarne koostöö, tervishoiutöötajate kogemused

CERCS: B685 Tervishoiukorraldus

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Abbreviations

ASPEN	American Society for Parenteral and Enteral Nutrition
EN	Enteral Nutrition
ESICM	European Society of Intensive Care Medicine
ESPEN	European Society for Clinical Nutrition and Metabolism
ICU	Intensive Care Unit (Anaesthesiology and Intensive Care Clinics in this study)
MUST	Malnutrition Universal Screening Tool
N	Nurse
NEMS	Nutrition Education in Medical Schools
NRS-2002	Nutritional Risk Screening 2002
NST	Nutrition Support Team
P	Physician
PN	Parenteral Nutrition
SGA	Subjective Global Assessment
UK	United Kingdom
USA	United States of America

1. Introduction

1.1. Hospital nutritional care

Nutritional care within hospital settings is an integral component of patient recovery. There is a growing emphasis on the impact of nutritional therapy on patients' recovery and ensuring their well-being. In this study, the term nutritional care means a comprehensive approach that includes the form of nutrition, nutrient delivery, and managing nutrition-related conditions in hospitals, covering both preventive and clinical nutrition (Cederholm et al., 2017). In this thesis, 'doctor' and 'physician' are used interchangeably to refer to medical professionals with equivalent qualifications. Healthcare professionals, particularly doctors and nurses, serve as key contributors to the implementation and management of nutritional care in hospitals. The skills of healthcare professionals in assessing patients' nutrition and, if necessary, administering appropriate nutritional interventions play a major role.

Over fifty years ago, Butterworth (1974) exposed the issue of nutritional neglect in hospitals in his seminal article, "The Skeleton in the Hospital Closet." Despite advancements in medical care, several of the shortcomings he identified remain relevant today. Inadequate nutritional practices, such as failure to routinely record patients' height and weight, limited communication between physicians and dietitians, inconsistent integration of nutrition into clinical decision-making, and fragmentation of nutrition care continue to affect the quality of patient care (Marshall et al., 2019).

Malnutrition and other nutrition-related problems are common among hospitalised patients, but not all patients receive the necessary nutritional assessment and support. The experience of healthcare professionals in clinical nutrition practice is important for the nutritional care of inpatients. Although many studies have highlighted the critical role of nutrition in clinical outcomes, and hospitals have implemented specialised nutrition programs in response, gaps in the delivery of nutritional care persist (Botero et al., 2024; Palmer et al., 2021).

Despite increasing awareness of nutritional care, challenges remain in integrating clinical nutrition effectively into routine medical and nursing practice. Hospitals often rely on multidisciplinary approaches to optimise nutritional care, involving various healthcare professionals, including doctors, nurses, and specialised nutrition teams. Cooperation between healthcare professionals working in hospitals and the nutrition support team enhances the coordination and management of nutritional care, ensuring safe and cost-

effective nutrition support (Nightingale, 2010). Nowadays, hospitals are increasingly adopting multidisciplinary collaboration to enhance nutritional care through the nutrition support team. Across the globe, healthcare professionals, including doctors and nurses from various hospital departments, apply nutritional care, which encompasses nutritional screening, assessment, and help in achieving patients' nutritional goals.

International qualitative and mixed methods studies on hospital nutritional care have often focused on distinct groups of patients, for example, cancer patients (Murphy et al., 2021) or prescribing oral nutritional supplements to patients with malnutrition (Liljeberg et al., 2021) or barriers and enablers to nutritional care (Eide et al., 2015; Hazzard et al., 2021; Nielsen et al., 2024). Together, these studies indicate that while awareness of various aspects of nutritional care is growing, the views and experiences of hospital professionals regarding nutritional care are often neglected.

1.2. The nutrition support team

The nutrition support team (NST) concept emerged in the early 1970s to address malnutrition in various care settings, specifically for patients receiving parenteral (PN) and enteral nutrition (EN) as a multidisciplinary approach (Wesley, 1995). NST is a multidisciplinary team with effective communication that ensures optimal nutritional support for patients, improving treatment quality and reducing costs by minimising unnecessary treatments (King's & Lennard-Jones, 1992; Nightingale, 2010). NST is recommended by international organisations such as the American Society for Parenteral and Enteral Nutrition (ASPEN) and the European Society for Clinical Nutrition and Metabolism (ESPEN) (Mistiaen & Van Den Heede, 2020). Currently, data from the "NutritionDay®" shows that most major hospitals in Europe (approximately 66%) and in the USA (approximately 60%) have such NSTs (Reber, Strahm, et al., 2019).

The previous literature on NST implementation mostly originates from the UK and the USA (Mistiaen & Van Den Heede, 2020). NSTs have been increasingly recognised as key components in optimising nutritional care in hospitals. In recent years, systematic reviews (Eriksen et al., 2021; Mistiaen & Van Den Heede, 2020) have synthesised the evidence on the NST composition, tasks and impact, particularly within Western healthcare systems. Many studies focused on NSTs' efficacy and efficiency in preventing malnutrition and optimising hospital nutritional care (Gonzalez-Granda et al., 2021; Lee et al., 2024; Lopes et al., 2019; Martinuzzi et al., 2024; Reber, Strahm, et al., 2019). The composition, roles, and target populations of NSTs vary considerably across studies.

NSTs have different roles at a practical level, including providing advice on PN, EN, and home PN management, training, and developing nutrition guidelines. Their responsibilities can vary, ranging from full autonomy in managing nutritional care to a consultative capacity, advising hospital professionals. NSTs involvement can be routine or on demand. The frequency of ward visits and the delegation of procedural responsibilities, such as the placement of central lines, vary across practices. These procedures may be performed by the team or assigned to other specialists, depending on institutional protocols and expertise (Mistiaen & Van Den Heede, 2020; Nightingale, 2010).

Yinusa et al. (2021), in their review of quantitative, qualitative, and mixed-methods studies on hospital nutritional care, concluded that effective provision relies on strong multidisciplinary collaboration, clear communication, clinical leadership, and well-established collaborative practices. Across diverse international contexts, such as Mowe et al. (2006) in Scandinavia, Lyu et al. (2021) in China and Ajabnoor et al. (2023) in Saudi Arabia, hospital nutritional care is marked by a gap between healthcare professionals' positive attitudes and actual nutrition practice, often due to limited training in clinical nutrition, lack of standardised protocols, and insufficient integration of evidence-based guidelines and multidisciplinary collaboration.

Only a few international studies have examined healthcare professionals' experiences in providing nutritional care with the engagement of the NST. Notable qualitative studies include those focusing on hospital staff attitudes (Marshall et al., 2019) and their experiences of changes in nutrition care (Laur et al., 2017; Nielsen et al., 2024; Ottrey et al., 2020). Other studies have explored hospital professionals' experiences in administering nutritional care for older people (Avgerinou et al., 2020; Hestevik et al., 2019; Verwijs et al., 2020). Additionally, a qualitative study (Romano & Minns Lowe, 2022) investigated the collaboration and communication between dietitians and the multidisciplinary team in UK care homes.

1.3. Estonian context

The Estonian study “Integrating Nutritional Counselling into Estonian Primary Health Care” (Karolin et al., 2023) recommends paying more attention to ensuring the reliability of nutritional counselling services in healthcare at multiple levels. This focus is particularly relevant as Estonia has made strides in formalising nutritional care processes within hospitals. All Estonian hospitals utilise a unified system of diets aimed at patient

treatment. Over the past decade, there has been a growing focus on nutrition therapy at Tartu University Hospital (Kiisk, 2016). Tartu University Hospital has developed an e-HL database with a codified system of diets to meet patients' nutritional needs. In 2019, the Clinical Nutrition Committee was established to oversee clinical nutrition services at Tartu University Hospital (Kiisk, 2019). The Clinical Nutrition Committee consists of 13 members, including 8 physicians, 4 nurses, and 1 pharmacist, representing various hospitals and departments.

Despite these advancements, a significant gap in nutrition education within professional training has existed in Estonia, as in many other countries. Until recently, there was no dedicated university curriculum for nutrition professional training at the bachelor's, master's, or PhD levels in Estonia (Gurinović et al., 2015). There were no specialised medical specialities in clinical nutrition and registered dietitians so far. However, the landscape of medical education in Estonia has begun to change, with clinical nutrition gaining more recognition, moving beyond its previous limited role. Clinical nutrition education is important for training healthcare professionals since hospital nutritional care involves various clinicians with multiple roles.

Cuerda et al. (2019) emphasised the importance of integrating nutrition education into medical training, noting that while healthcare professionals are introduced to nutrition concepts during biochemistry classes in the early preclinical years, there is often a disconnect with clinical applications. Even in later years, nutrition education, including aspects of clinical nutrition, has remained insufficiently covered in medical curricula. Recent initiatives such as the Nutrition Education in Medical Schools (NEMS) project endorsed by ESPEN offer various models of nutrition education for incorporating clinical nutrition into medical training and clinical practice (Cuerda et al., 2021).

Now, clinical nutrition is a quickly advancing area of medical science in Estonia. Since 2023, the designation "nutritionist specialist" has been introduced for professionals with advanced training in disease-related nutrition therapy (Forbes, 2023). Tartu University Hospital is a teaching hospital and therefore has an opportunity to pay attention to nutritional care education and training. The Nutrition Therapy Centre was established at Tartu University Hospital in 2023. Now there are ten employees, including four doctors, four nurses, a coordinator, a pharmacist and currently a resident doctor at the Nutrition Therapy Centre (<https://www.kliinikum.ee/kliinikud-jateenistused/teenistused/toitmisravi-keskus/>).

Accordingly, the formal NST is a recent implementation in nutritional care at Tartu University Hospital. The Hospital has a nutritional management system consisting of a nutritional steering committee — the Clinical Nutrition Committee — and a multiprofessional NST. The NST at Tartu University Hospital provides consultation services in response to requests from clinicians. However, with respect to a recently formed NST in the Estonian context, little is known about the perspectives of hospital doctors and nurses on their clinical nutrition collaboration with NST. Kaja Eiche's (2018) master's thesis on clinical nutrition at the North Estonia Regional Hospital — a quantitative study — highlighted the need for a greater understanding of clinical nutrition practices, revealing discrepancies between healthcare professionals' desired and actual opportunities. This gap illustrates the need for qualitative research data to deepen our understanding of the experiences faced by healthcare professionals in this field.

Therefore, researching the clinical nutrition experiences of hospital doctors and nurses is very relevant. To our knowledge, this topic has not been previously studied using qualitative methodology in Estonia. This highlights the need for qualitative research investigating hospital-based professionals' experiences of nutrition therapy practices and their collaboration with the NST. Therefore, this study aims to explore the experiences of hospital doctors and nurses regarding the nutritional care of their patients and collaboration with the NST. Thus, the main research question of this qualitative study is: What is the experience of hospital doctors and nurses in providing nutritional care and collaborating with the NST?

The next chapter presents the methodology employed in this study.

2. Methodology

This chapter provides a description of the research methodology used in this study to explore the experience of doctors and nurses regarding their clinical nutrition practice and cooperation with the NST at Tartu University Hospital. Standards for reporting qualitative research (O'Brien et al., 2014) were followed. Firstly, the study aims and objectives, the research design and method will be introduced, followed by the sampling strategy and study setting. Next, the chapter outlines the procedures for data collection and analysis, as well as the ethical considerations addressed during the research process.

2.1. Aims of the study

The aim was to explore hospital doctors' and nurses' experiences with providing nutritional care and their collaboration with the NST.

The specific objectives of the study were:

1. To explore doctors' and nurses' views on clinical nutrition practices.
2. To investigate doctors' and nurses' awareness of the availability of the NST.
3. To explore how doctors and nurses collaborate with the NST.
4. To identify the views of doctors and nurses on the development needs for hospital nutritional care.

2.2. Study design

The design was a single-centre cross-sectional study using a web-based, self-administered survey with an open-ended questionnaire to collect data from doctors and nurses at Tartu University Hospital during January 2025. A cross-sectional study is a research design where data is collected from many individuals at a specific time. In this study, data were gathered in January 2025 from hospital-based doctors and nurses.

A cross-sectional study applied a qualitative descriptive research approach. The principles of qualitative descriptive research are guided by the interpretivist paradigm. The qualitative descriptive approach is particularly valuable in healthcare research as it facilitates the generation of insights grounded in participants' own words (Sandelowski, 2000). This approach provides insights into specific contexts and phenomena. It invites study participants to share their perspectives through open-ended questions, allowing for the flexibility of the approach to uncover details that may not be visible through quantitative methods. Thus, a cross-sectional study design with the qualitative descriptive

research approach was found applicable to answer the research question proposed in the thesis.

2.3. Research method

This study employed a web-based qualitative survey research method with an open-ended questionnaire to collect textual data from hospital doctors and nurses, allowing them flexibility to respond anonymously and at their convenience.

The use of questionnaires as a method of data collection in healthcare research remains common and continues to be a valuable tool for gathering insights (Rattray & Jones, 2007; Thomas et al., 2024). Fan et al. (2024) described web-based qualitative research as valuable, as well as offline methods for data collection. Conducting a qualitative questionnaire in a virtual environment provides an alternative to traditional interviews, especially when time constraints and language barriers exist between the researcher and participants. Therefore, a web-based qualitative questionnaire was selected to achieve the study aims.

2.4. Questionnaire development

A review of previous literature on qualitative questionnaire-based studies in the field of clinical nutrition was conducted. Many of the questionnaires identified were fully quantitative (Ajabnoor et al., 2023; Lyu et al., 2021; Mowe et al., 2006; Mundi et al., 2022; Rudie et al., 2024; Schindler et al., 2010; Ten Cate et al., 2021) or employed mixed methods (Lawrence et al., 2021; Murphy et al., 2021). Subsequently, the design principles for creating qualitative questionnaires in the healthcare field, with a focus on nutritional care, were examined. The current questionnaire follows the methodological and practical guidance on the design and implementation of qualitative questionnaires authored by Samantha L. Thomas et al. (2024) and Virginia Braun et al. (2020).

Questionnaire development was an important component of this study, as it involved creating a structured tool for gathering data from respondents. After understanding the basics of the design and use of questionnaires in research, the following steps are considered in the questionnaire development.

Step 1. Literature review and methodological guidance.

Prior to the commencement of the research study, a literature review of previous relevant questionnaires about hospital doctors' and nurses' experience of nutritional care and NST cooperation from Estonia and other countries was conducted. Generally, there is a very

limited amount of literature that focuses methodologically on qualitative surveys (Braun et al., 2020). To the best of our knowledge, no previous qualitative studies have specifically explored hospital professionals' experience with clinical nutrition and collaboration with the NST using an open-ended questionnaire. Accordingly, the development of the questionnaire followed methodological guidance from Thomas et al. (2024) and Braun et al. (2020), whose frameworks for designing and implementing qualitative questionnaires are widely applied in healthcare research.

Step 2. Composing of questionnaire items.

The compilation of questionnaire items was guided by both theoretical considerations and practical relevance to hospital nutritional care and collaboration with the NST. Key factors considered included alignment with the research question, clarity of language, and the capacity of each item to elicit rich, reflective responses. This step involved creating questionnaire items, specifically open-ended questions and the cover letter for participants.

Open-ended questions.

The open-ended questions focused on respondents' clinical nutrition practices and their collaboration with the NST, encouraging them to share their experiences in these areas. Attention was given to using non-leading and neutral wording to minimise bias and allow for diverse viewpoints. The questionnaire also considered the busy work schedules of healthcare professionals by maintaining a concise yet comprehensive format. The wording of the questions aimed to ensure clarity and inclusiveness of the research topic. The questions aimed to capture relevant elements of nutritional care and team collaboration. Both mandatory and voluntary open-ended questions were included in the questionnaire, depending on the question context. Mandatory questions intend to gather essential information from all participants, while voluntary questions provide respondents with the flexibility to share their insights. A response format was then created that allowed respondents to enter their responses as free text. The questionnaire was designed to be visually appealing and easy to navigate, considering Tartu University LimeSurvey guidance (<https://survey.ut.ee>).

Cover letter for participants.

The cover letter was designed to convey the necessary information to the participants. It included greetings for doctors and nurses, information about the study background and purpose, details about the researchers, the study topic, and the reasons for participation. It also addresses data anonymity, voluntariness, and informed consent. (See [Appendix I](#)).

Step 3. Piloting the questionnaire.

Piloting refers to a test of the questionnaire to assess the clarity, relevance, and functionality of the open-ended questions and identify any potential issues and ensure that the technical aspects of the web-based questionnaire work as intended. Prior to data collection, after the questionnaire items were developed and ethical approval was obtained, the questionnaire was piloted. For the pilot testing, two nurses and one doctor, who met the sample criteria, working at Tartu University Hospital, were verbally invited to partake in the pilot questionnaire, which they cordially accepted. They were asked to provide feedback on its clarity, relevance, and overall design. This piloting process helped to ensure that the questionnaire was well-structured, easy to understand, and capable of capturing the data for the study. Their feedback highlighted minor issues related to the wording of two questions. After pilot testing the questionnaire, the next step was its evaluation.

Step 4. Questionnaire evaluation.

Based on comments from the pilot testing step, minor changes were made to the wording of two questions, but these changes were not significant enough to require further review by the Ethics Committee. Although the pilot sample was small, it provided insights into the questionnaire's suitability for the target group. Data from the pilot was not included in the final analysis.

2.5. The questionnaire employed

The study utilised a self-administered, web-based qualitative questionnaire comprising open-ended questions. The final version of the questionnaire consisted of the cover letter (brief introduction of the survey and ethical considerations) and 13 questions presented in two parts. The opening page of the questionnaire started with the Cover Letter for participants.

The first part of the questionnaire included four background questions about work experience and clinical nutrition training. Three background questions were mandatory: one required a yes/no response, while the other two were open-ended.

The second part included nine questions focused on clinical nutrition practice and cooperation with the NST. Three of which were mandatory, while the remaining six were optional. Questions were presented one by one. The language of the questionnaire was in Estonian. The open-ended questionnaire items are provided in [Appendix 2](#). The questionnaire was expected to take about 20 minutes to complete.

The questionnaire was web-based, self-administered and anonymous. This approach allows participants to complete the questionnaire at their convenience, ensuring greater flexibility and accessibility. Virtual platforms provide a solution for conducting a web-based qualitative questionnaire. The LimeSurvey (<https://survey.ut.ee/index.php/>) is an easy-to-use environment for creating online surveys, enabling researchers and participants to connect. This platform enables self-administration, allowing participants to complete surveys independently. The LimeSurvey platform of Tartu University is a valuable and secure place for university learners and Tartu University Hospital employees to conduct research surveys. It is designed to collect data using different question types, including open-ended questions. The online format facilitated convenience. The LimeSurvey platform was accessible and familiar to Tartu University Hospital employees, including doctors and nurses. This familiarity facilitated independent navigation and completion of the questionnaire.

Anonymity. No personal data, such as names or contact details, was collected; respondents' IP addresses and other personal data were not recorded when completing the questionnaire. The respondents had the possibility to fill out the questionnaire at a time convenient to them. The questionnaire was open for one month in January 2025.

2.6. Sample

This study employed convenience sampling to include hospital doctors and nurses who are providers of hospital nutritional care, based on the literature, and were ready to participate in the survey. This method facilitates timely data collection by engaging with potential participants who are available and willing to participate. The sample criteria were established as follows: doctor or nurse working in the Departments of Gastroenterology, Nephrology, Rheumatology-Endocrinology, and Infectious Diseases of the Internal Medicine Clinic, as well as Intensive Care Departments 1, 2, and 3 in the Anaesthesiology and Intensive Care Clinic at Tartu University Hospital. These departments were selected as they probably manage nutritional problems, and therefore, we are able to collect different views on the clinical nutrition practice and cooperation with the Clinical Nutrition Centre of the Tartu University Hospital.

Considering the qualitative research design with the web-based questionnaire and timeframe of study duration, the sample size was determined to include all that is received within the one-month (January 2025) data collection. Based on the number of healthcare professionals working in these units (86 doctors and 244 nurses), and the common survey

response rate of 10-20%, we anticipated receiving up to 100 responses, with 30 considered the optimal number for this qualitative study. During the data collection period of one month, 31 responses were obtained.

2.7. The setting

The setting for this study was Tartu University Hospital. An invitation letter that included study details and a link to the web-based survey for doctors and nurses was sent with assistance from the Human Resources Department at Tartu University Hospital. This way also ensured the anonymity of the study. The human resource secretaries from the Internal Medicine Clinic and the Anaesthesiology and Intensive Care Clinic assisted in distributing the questionnaire invitation letter email, along with a reminder letter email sent two weeks later. The email included a brief description of the study's purpose, estimated time commitment, and a consent statement, ensuring informed participation.

2.8. Data collection

Data was collected after obtaining Ethical approval through a web-based, self-administered survey conducted in January 2025. The questionnaire was activated for participation on January 1, 2025, and remained accessible for four weeks. The LimeSurvey environment (<https://survey.ut.ee/index.php/>) of the University of Tartu was used for data collection, which was a convenient way for participants to submit their responses.

After completion of the data collection, the data were exported into a Microsoft Excel worksheet. Further, for data analysis, the responses were translated from Estonian into English. Translation was reviewed for accuracy by a language advisor from the University of Tartu. The Estonian-speaking supervisor, Kadri Suija, conducted an additional check of the translation accuracy of the original answers and reviewed the analysis of responses.

2.9. Data analysis

A qualitative descriptive approach, employing inductive thematic analysis (Braun & Clarke, 2012), was used to analyse the data. This approach allows the identification of key themes related to the research questions. In qualitative research, the researcher aims to understand the meanings that participants associate with a problem, rather than imposing their own views or depending solely on existing literature (Creswell, 2009). The analysis is conducted iteratively, with initial codes being refined and grouped into broader themes as the analysis progresses. Thematic analysis is used to identify, organise, and

interpret themes. Each theme is considered in context. It focuses on the significance of the data, allowing for an understanding of common and shared experiences, as noted by Braun and Clarke (2012). The data analysis followed Braun and Clarke's (2012) systematic method of thematic analysis, which consists of the following steps:

- 1) Familiarising with the data,
- 2) Generating initial codes,
- 3) Identifying themes,
- 4) Assessing potential themes,
- 5) Defining and naming themes, and
- 6) Drawing a conclusion.

The first step included reading and re-reading the raw data and identifying items of potential interest. To generate initial codes, open coding is used. The process began with independent line-by-line open coding of answers by two people (me and supervisor Kadri Suija). In that way, codes were developed and modified through the coding process. To enhance the reliability of the coding process, 30% of the dataset was also recoded independently by Kadri Suija using the original answers in the Estonian language. This percentage was chosen to allow for cross-checking while being feasible within the scope of a master's thesis. After completing the initial coding, we compared our codes, discussed discrepancies, and refined them through consensus, ensuring coherence in the coding framework. Coding patterns and emergent themes were discussed and refined in ongoing meetings. Once the codes were finalised, I proceeded to search for broader themes relevant to the research question. This process involved systematically grouping related codes into potential themes and subthemes. The themes were predominantly descriptive, capturing patterns in the data that reflected participants' experiences. Through an iterative process, I revised and refined the themes by merging similar ones and reorganising them for clarity. We had regular meetings to discuss the interpretations, subthemes and their grouping under the themes. Themes are illustrated in [Table 2](#).

2.10. Ethical considerations

Ethical approval. Permission from Tartu University Hospital, Reference PKL-127, to conduct the study was obtained on 26.11.2024 ([Appendix 3](#)). This study was approved by the Human Research Ethics Committee of the University of Tartu, Protocol No. 395/T-9

dated 04.12.2024 ([Appendix 4](#)). Data collection started after obtaining digitally signed approval from the Human Research Ethics Committee.

Data confidentiality: No personal data, such as names or contact details, was collected. The data was used in the analysis in a generalised form.

Voluntariness and informed consent. Participation in the study was voluntary. By completing the questionnaire, participants give their informed consent to participate in the study. Participants were informed of the study description and information for participants in the questionnaire cover letter.

Data retention and security. The collected data is stored on a work computer at the University of Tartu server. Both my supervisors and I had access to the collected data. The questionnaire was on the LimeSurvey (<https://survey.ut.ee/index.php/>), which is a secure environment for data collection. The IP addresses or other personal data of the respondents are not stored when completing the questionnaire.

AI disclosure. I have used AI-assisted technologies, including OpenAI ChatGPT-3.5, Microsoft Copilot, and Grammarly to assist me in the thesis writing process to improve writing style, readability, identify synonyms for key terms, check the grammar and correct formatting of the reference style. They were not employed for the content creation or data interpretation, and no original data was disclosed. The general guidelines for using AI tools of the University of Tartu (<https://ut.ee/en/content/guidelines-using-ai-applications-teaching-and-studies>) are considered.

The following chapter will present the study results.

3. Results

This section presents the findings from the qualitative analysis of the data on hospital doctors' and nurses' experiences with nutritional care and their collaboration with the NST. The findings are structured as follows: first, an overview of the study group is provided, followed by a presentation of themes with their subthemes identified through thematic analysis.

3.1. An overview of the study group

[Table 1](#) presents an overview of the study group. A total of 31 participants (17 physicians and 14 nurses) from the Internal Medicine clinics, and Anaesthesiology and Intensive Care clinics (henceforth ICU) took part in the study. Ten physicians were from Internal Medicine and seven from the ICU, while the nursing staff included seven from each clinic. Most of the participants had more than five years of work experience. Participants reported varying levels of engagement in clinical nutrition training. The responses indicated that nutrition-related educational programs were short-term, between one to eight hours, approximately no more than one study day. EN and PN were the most attended topics by participants. To mention, the names of training topics were provided as selectable options. Additionally, participants had the opportunity to contribute free-text responses on training topics. Notably, none of the participants indicated having attended specific training on Nutritional screening.

Table 1. An overview of the study group

Occupation	Total number of respondents
Physician in the Internal Medicine clinic	10
Physician in the ICU	7
Nurse in the Internal Medicine clinic	7
Nurse in the ICU	7
Duration of work experience	
less than 5 years	5
5-9 years	9
10-14 years	7
more than 15 years	10
Participation in clinical nutrition training in the last 5 years	
Yes	13
No	18

Training topics	Duration range (in academic hours)	Number of respondents
Enteral nutrition	1-8	7
Parenteral nutrition	1-8	5
Nutrition of malnourished patients	2-8	2
Nutritional screening	-	-
Other nutrition topics (Healthy Food 2024, ESICM conference)	3	2

3.2. Hospital doctors' and nurses' experiences with nutritional care and collaboration with the nutrition support team

We identified three key themes and seven sub-themes presented in [Table 2](#). Data extracts are provided to illustrate these themes in the text. The quotes from participants are attributed using the following identifiers: (P) for speciality physicians and (N) for nurses.

Table 2. Themes Nutritional care and collaboration with the nutrition support team

Theme 1 Nutritional screening and assessment practice	Theme 2 Collaboration with the nutrition support team	Theme 3 Roles and perspectives of health professionals in nutritional care
Subtheme 1.1. Nutritional screening – a research tool more than a clinical practice Subtheme 1.2. Nutritional assessment is a routine in ICU practice and need-based in general wards	Subtheme 2.1. Awareness of nutrition support team consultation Subtheme 2.2. Reasons for nutrition support team consultation Subtheme 2.3. Communication with the nutrition support team	Subtheme 3.1. Professional roles and autonomy in nutritional care Subtheme 3.2. Staff perspectives on enhancing nutritional care

3.2.1. Theme 1. Nutritional screening and assessment practice

Theme 1 presents how doctors and nurses described their experiences with nutritional screening and assessment, which are the first steps of the nutrition care process.

Subtheme 1.1: Nutritional screening – a research tool more than a clinical practice

Doctors and nurses shared their experiences with nutritional screening in clinical practice. Participants stated that screening tests are not used in practice. Doctors and nurses noted

that screening tests were neither consistently performed upon admission nor conducted periodically afterwards in Internal Medicine departments. However, they pointed out that screening tests are mainly performed for research trials. Some doctors noted their familiarity with the Nutritional Risk Screening 2002 (NRS-2002). Although they acknowledged screening tests, some expressed confidence that screening implementation in the hospital was unlikely:

“Does not work in inpatient care.” (P)

Despite not performing screening in the ICU, doctors expressed that they treat all ICU patients as being at risk of malnutrition:

“All patients in intensive care are at high risk of malnutrition. Screening tests (NRS 2002) are not routinely used outside of trials rather in IROs.” (P)

Doctors look for patients' previous information on nutrition and weight loss in a medical history.

Subtheme 1.2: Nutritional assessment is a routine in ICU practice and need-based in general wards

Participants mentioned that in the ICU, nutritional assessment components are performed daily, on admission and during treatment in the ICU:

“In intensive care patients, we assess nutrition on a daily basis. Whether able to eat orally, feeding through a tube and partial/complete intravenous nutrition available. What is the losses and what is the nature of the losses; what is their potential composition and duration. In a new patient, we assess the level of malnutrition. We calculate calories, protein needs; physical capacity, etc.” (P)

It was not necessarily standardised and predefined tools like the Subjective Global Assessment (SGA). Participants also mentioned a medical history, physical examinations and biochemical analyses as integral parts of nutritional assessment. Many ICU doctors described in detail the nutritional care in the ICU, emphasising its importance for critically ill patients. By ICU doctors and nurses, all patients in the ICU are recognised as being at risk for malnutrition. ICU doctors emphasised following the ESPEN guidelines in providing nutritional support in their practice:

“Risk assessment in the patient, determination of prealbumin and electrolytes if necessary. Initiation, modification, and monitoring of feeding according to ESPEN guidelines.” (P)

For nutritional assessment, many respondents from the ICU stated that they use various laboratory tests:

“On admission to intensive care, we assess body weight, protein and albumin in the blood, and information on previous weight loss (we do not assess the previous weight of all patients). During intensive treatment, we assess body weight (daily), albumin, and prealbumin.” (P)

Nurses expressed that it is the doctors' work to assess nutritional needs:

“In the ICU, doctors do this, determine the calorie intake of the patient and then choose the appropriate tube feed and target speed.” (N)

Intensivist doctors expressed that they do estimate nutritional needs. The following example illustrates common approaches to setting intake targets:

“In most cases, aim to reach “full caloric intake” by ~4...7 days (or later if multi-organ failure persists at a very severe level). We usually define “full caloric intake” or the target for the final energy intake as 25 kcal/kg ABW/kg or as measured by volumetric capnography.” (P)

Some Internal Medicine department doctors and nurses reported that nutritional assessment is not a primary focus in their daily practice, and the nutritional status of patients is not assessed upon admission to the regular wards. In contrast to the ICU, Internal Medicine departments conduct nutritional assessments in cases of significant changes in the weight or poor health of patients. A nurse from the Internal Medicine department stated that the assessment of nutritional status will be based on the doctor's decision:

“On doctor's orders - body weight, BIA, blood tests.” (N)

The Internal Medicine department doctor described using the plate-drawing method for monitoring the diets of all patients, providing nutritional supplements, and, when necessary, offering EN and PN, with a preference for enteral feeding:

“We monitor the diets of all sick people (using a 'plate-drawing' method) and if there seems to be a problem, we try to map it and find a solution. We don't use specific scores for this. As a first solution, we offer e.g. Nutridrink as a supplementary food. In addition, we also have patients with swallowing disorders + some patients are so severe that sometimes they need supplementary feeding.” (P)

Internal Medicine doctors indicated that they collaborate with diabetes nurses on diabetes cases and with the NST for nutritional assistance:

“Usually, patients who are in poor general health and require parenteral nutrition. I ask for help from the nutritional care team when I need it.” (P)

3.2.2. Theme 2. Collaboration with the nutrition support team

This theme includes three subthemes: Awareness of nutrition support team consultation (2.1), Reasons for nutrition support team consultation (2.2), and Communication with the nutrition support team (2.3).

Subtheme 2.1. Awareness of nutrition support team consultation

Awareness of the availability of NST varied among doctors and nurses. Most responses to this question came from doctors, likely due to their role in determining whether the NST consultation is necessary. Some participants from the Internal Medicine and ICU departments were not aware of the availability of NST consultations at the hospital:

“Probably there is, but there is no exposure.” (P)

A nurse from the ICU department also mentioned that there is no team for nutrition consultations:

“To my knowledge, no. Consultations are made internally within the hospital. The nutrition-related decisions are mostly made by doctors and nurses in collaboration.” (N)

Many others were well-informed about the availability of NST consultations. Participants mentioned their interactions with the NST. The following quote by a doctor from the ICU was typical:

“We don't have one in the clinic, but the hospital does, and they are available to us if needed. To my knowledge, the team includes Dr. AF and another young man ... as well as one or more nurses with specialised expertise in clinical nutrition.” (P)

Some narratives illustrated a passive interest in NST consultation availability. Some staff members have not previously requested input from the NST but knew that the team consulted other colleagues in the department on nutrition support issues. Not all participants knew who the NST members were. This is illustrated by the quote:

“I know our hospital generally has a team, but I have not needed them so far. Due to some other patients, they have been in the departments briefly. I don't know who is on that team.” (P)

Participants who had experience with consultations from the NST identified the team members as including the team leader, a physician, and a diabetes nurse. They also described their interactions with these team members:

“We seek advice from the nutrition support team (for example, the highly skilled specialist GL, who previously worked with us as a diabetes nurse for 20 years).” (P)

Subtheme 2.2. Reasons for nutrition support team consultation

The needs for NST consultation differed between participants from the ICU and Internal Medicine departments. The ICU doctors described that NST consultations are most needed for nutritional care planning for patients with feeding issues when transferring from the ICU to regular wards. The ICU participants expressed concerns about the continuity of nutritional care follow-up after leaving the ICU and its support in Internal Medicine departments. They explained that NST consultations give ongoing support to patients after leaving the ICU:

“Planning for the follow-up of patients with complex feeding problems after transfer from the ICU to the general department - so that feeding-related attention and competence could continue there.” (P)

The ICU doctors noted NST consultations were also necessary in cases of chronic nutritional problems, severely obese or underweight patients, as well as when planning home EN or PN therapy:

“Patients with chronic undernutrition. Patients with severe chronic/long-term gastrointestinal insufficiency, including those with short bowel syndrome.” (P)

The Internal Medicine doctors acknowledged their need for NST assistance in cases such as technical aspects of feeding, EN and PN complications, refeeding syndrome, and

swallowing difficulties. They also mentioned the need for NST consultations when oral intake and oral nutritional support are not possible due to patient conditions:

“Problems with the technical side of the feeding process or enteral/parenteral feeding complications. In general, we have so far done well with initiation and monitoring.” (P)

A nurse from the Internal Medicine department highlighted the necessity of seeking NST consultation when managing patients with dysphagia:

“For patients with swallowing problems, nutrition for the chronically ill.” (N)

Subtheme 2.3. Communication with the nutrition support team

Participants expressed no obstacles in communicating with the NST. Some doctors expressed interest in better understanding the functioning of the NST. For example, one ICU doctor stated:

“There is no direct obstacle to cooperation, but I would like to know more about the services offered by the Nutritional Therapy Centre.” (P)

Some participants have not requested the NST consultation, while others frequently seek advice from it. ICU and Internal Medicine doctors shared their experiences and expressed positive feelings about their collaboration with the team:

“All the cases have gone well; I have always received help from the nutritional therapy centre.” (P)

Participants described the NST as approachable and willing to share their expertise:

“They seem to monitor patients carefully and act sensibly.” (P)

Mainly, doctors responded to the question about past experiences with the NST cooperation, rather than nurses. In contrast, a nurse’s experience with the NST related to training:

“I have no experience. I have only attended their training, where they provided useful information and encouraged reaching out to them.” (N)

Participants mentioned that team consultations may occur either within the ward or department or remotely through telephone communication, depending on specific circumstances:

“Prof. AF has been on several visits, and telephone contact with the nurses in the nutritional care unit is helpful and useful.” (P)

Participants emphasised the importance of good communication with team members to coordinate nutritional care, particularly for patients with complex medical conditions and receiving PN.

3.2.3. Theme 3. Roles and perspectives of health professionals in nutritional care

The theme “Roles and perspectives of health professionals in nutritional care” includes two subthemes: Professional roles and autonomy in nutritional care (3.1) and Staff perspectives on enhancing nutritional care (3.2).

Subtheme 3.1. Professional roles and autonomy in nutritional care

Perspectives on health professionals’ roles and autonomy in clinical nutrition practice emerged strongly among ICU participants but were less pronounced among Internal Medicine participants. ICU doctors acknowledged their responsibility to deliver nutrition support, recognising it as an integral component of routine ICU care:

“There are rather fewer of these cases [when the team nutritional support assistance is needed] in the intensive care unit, as we deal with these issues daily. However, they would most likely involve patients with severe nutritional disorders and the need to enhance oral feeding.” (P)

Many ICU doctors perceived that all hospital physicians should be competent in providing nutritional care in their units. At the same time, they recognised that the NST is essential for offering support in more complex cases that require specialised nutritional care:

“This is important; it is a basic competency for every specialty and every doctor. In complex and specific cases, there should be an opportunity to consult with highly specialised nutritional therapy doctors and nurses.” (P)

Some ICU doctors demonstrated professional autonomy, describing they generally manage nutritional care without requiring external team support:

“We manage by ourselves the feeding of intensive care patients from start to finish in 99% of cases.” (P)

Unlike ICU staff, Internal Medicine participants expressed a limited commentary on the professional's role and autonomy in nutritional care. They described their contribution to nutritional care provision:

“We monitor the diets of all sick people (using a 'plate-drawing' method) and if there seems to be a problem, we try to map it and find a solution.” (P)

An Internal Medicine doctor stated adherence to nutritional care principles in their clinical nutrition practice:

“We always give preference to enteral feeding, but if this is not possible we sometimes start with parenteral feeding. We monitor patients for refeeding syndrome and gradually increase the required caloric intake.” (P)

Some doctors of Internal Medicine departments expressed challenges in their clinical nutrition practice:

“Parenteral feeding - no overview of how to correct it.” (P)

ICU and Internal Medicine nurses mentioned their clearly defined roles in nutritional care between physicians and nursing staff. They described the responsibilities involved in providing nutrition support. Many ICU nurses acknowledged that doctors are primarily responsible for assessing patients' dietary needs, decision-making on nutrition support, and determining the appropriate delivery route:

“In the ICU, doctors do this, determine the calorie intake of the patient and then choose the appropriate tube feed and target speed.” (N)

Internal Medicine nurses also noted that nutritional assessments are determined by the doctors' decision-making, while the primary responsibility of nurses lies in monitoring the feeding processes in accordance with a feeding protocol. An ICU nurse illustrated the roles that nurses play:

“In the course of my work, my activities related to nutrition are limited to the following: Starting/finishing enteral and parenteral feeding, choosing the appropriate method of feeding (suggestion to the doctor if necessary). monitoring the patient with regard to

enteral feeding (gastric emptying, residue and its appearance/composition). Choice of diet (diabetic/non-diabetic).” (N)

Subtheme 3.2. Staff perspectives on enhancing nutritional care

Participants suggested several key areas for improving hospital nutritional care. These include increasing awareness of the clinical benefits of NST, providing training for hospital staff, enhancing digital systems for ICU nutritional management, improving patient nutritional and swallowing assessments, and integrating a nutritionist and a nutrition nurse into Internal Medicine departments.

More attention to the topic was suggested by ICU participants. They highlighted the importance of developing awareness regarding clinical nutrition and the consultation of the NST in all clinical areas of the hospital:

“... General awareness (across all specialties and fields) needs improvement.” (P)

Many doctors expressed the need for training from the hospital’s nutritional care centre. An ICU doctor recommended the expansion of the NST to improve their availability and accessibility for nutritional care and training:

“A larger team so that nutritional therapy would be available to all patients in all departments. Staff training on nutritional care (We train staff on nutritional therapy). Protocols (I don't know how nutritional protocols and their standardisation are outside of ICUs).” (P)

An ICU doctor reflected on the challenges associated with the feasibility of home PN:

“We have referred patients with severe malabsorption syndrome to the nutritional care team and for the planning of home enteral nutrition therapy. We currently have no information on the capacity of home parenteral nutrition in the Tartu region.” (P)

Some participants pointed out specific challenges in clinical nutrition practice, including enteral formula selection, underuse of calorimetry for intensive care patients, and oversight of calorie calculations:

“The list of enteral formulae in use is long, not standardised. It changes all the time. The feeding calculator is not handy. Calorie calculations are often forgotten to carry out. Calorimeters are underused. Insulin protocol should be automated.” (P)

Some doctors expressed the need for improved digital integration of ICU nutritional care in electronic health records:

“Feeding intensive care patients needs to be better digitised in e-Intensive Care facilities. There is huge scope for development here.” (P)

The Internal Medicine doctors expressed the need for better patient nutritional assessment:

“Perhaps patients should be assessed even more, as many would likely need additional calories, for example, during an infection.” (P)

The Internal Medicine doctors and nurses expressed a need for improved swallowing assessment for patient safety and nutritional care:

“Assessment of swallowing physiology in the prone patient. Whether could be fed orally.” (P)

Many nurses from Internal Medicine departments expressed a need for a clinical nutritionist in every clinic:

“A nutritionist, a nurse specialising in nutrition would be needed.” (N)

4. Discussion

This study is the first qualitative cross-sectional survey to explore hospital doctors' and nurses' experiences with nutritional care and their collaboration with the NST in the Estonian hospital context. The findings provide insights into professional engagement with clinical nutrition and multiprofessional collaboration in a setting where such practices have been underexplored. The participants were from Internal Medicine Clinics (n=17) and ICU Clinics (n=14) at Tartu University Hospital, who completed an open-ended web-based questionnaire in January 2025. The data was analysed using a descriptive qualitative thematic analysis inductive approach. Three key themes were identified: nutritional screening and assessment practice, collaboration with the NST, and roles and perspectives of health professionals in nutritional care.

4.1. Nutritional screening and assessment practice

The findings of this study show that nutritional screening was utilised for research purposes more than routine clinical practice. While all ICU patients were considered at risk of malnutrition, patients in the Internal Medicine departments might be vulnerable to insufficient nutritional care, as their risk of malnutrition may not always be assessed and addressed systematically. Some participants even stated that screening would not work in hospital settings. However, the current study could not provide knowledge on barriers to nutritional screening or why nutritional screening is not implemented as a hospital standard practice.

These findings partially align with international guidelines for hospital nutritional care and previous studies, showing similarities in practice; however, some differences persist in certain aspects. There is an international consensus, and guidelines recommend nutritional screening of all patients in hospital settings (Cederholm et al., 2017; Singer et al., 2023). ICU participants' approach is in line with the practical recommendations by ESPEN, which indicate that any critically ill patient staying in the ICU for more than 48 hours should be regarded as at risk for malnutrition (Blaser et al., 2019; Singer et al., 2023).

The discrepancy between the standards and clinical practice of screening was in line with other quantitative and qualitative studies (Green & James, 2013; O'Connell et al., 2018; Schindler et al., 2010; Taipa-Mendes et al., 2021). In their review of qualitative studies on nutritional screening by nurses, Green and James (2013) concluded that routine

malnutrition screening will not occur unless it is seen as an essential part of nursing assessments. Additionally, this practice must be supported by appropriate policies and resources. Also, it is well-known that no single nutritional screening tool is considered the gold standard (Rabito et al., 2017).

In contrast, in a qualitative study on hospital nutritional care, Van den Berg et al. (2023) reported that in a Dutch academic hospital, nurses routinely screened and assessed patients for malnutrition using the Malnutrition Universal Screening Tool (MUST) and recorded food and fluid intake in the electronic patient file. Positive experiences with screening and calculating energy intake in at-risk patients were also reported in quantitative studies in a Danish hospital by Lindorff-Larsen et al. (2007) and in German hospitals where regular screening was more common in hospitals with NSTs (83%) than without (47%), with NRS-2002 being the most frequently used tool (Rau et al., 2024).

On top of that, considering the nutritional assessments only for cases of significant weight changes or poor health of patients was expressed as usual practice in Internal Medicine departments by participants. By focusing only on cases with significant weight changes or poor health, early signs of malnutrition or other nutritional issues in seemingly stable patients might be missed.

Consequences of inadequate nutritional risk screening and assessment could raise undiagnosed malnutrition, risks of complications, longer hospital stays, increased mortality, and higher healthcare costs (Botero et al., 2024; Orell et al., 2023; Reber, Gomes, et al., 2019). Importantly, the prevalence of malnutrition in Estonian hospital patients assessed using the Subjective Global Assessment (SGA) was 42.5% (Klek et al., 2015). Numerous studies highlight the necessity of implementing mandatory nutritional screening due to the high prevalence of nutritional risk, which is essential for improving nutritional care (Botero et al., 2024; Taipa-Mendes et al., 2021).

To tackle these challenges, some studies found improving routine nutritional risk screening in hospital settings with a technology-assisted nutritional screening system implementation (Carrera-Gil & Rusca, 2024). Another study reported the organisation of good nutritional practices in Scandinavian hospitals with significant improvements in screening, nutrition plans, and monitoring (Holst et al., 2014).

Nielsen et al. (2024) suggest the implementation of nutritional practices in hospitals with a clear division of tasks and multidisciplinary teamwork, emphasising the role of a NST to facilitate the development and focus on nutritional practices. A single NST cannot deliver nutritional screening and an individualised nutritional plan to every patient. Thus,

the role of this team in providing nutrition education and training is important (BAPEN, 2007).

Nutritional screening plays a role in identifying patients at risk of malnutrition. Notably, none of the participants of this study indicated having received specific training in nutritional screening. This suggests a potential gap in professional development related to the early identification of patients at nutritional risk and highlights a possible area for further education and training within the hospital setting. Participants of this study were interested in nutritional training by the NST of the hospital. The different kinds of barriers to screening could be easily addressed through staff education or changes to hospital policy (Rudie et al., 2024). Looking at an overview of our study group, it is seen that the respondent doctors and nurses had not taken many courses in clinical nutrition training in the last 5 years. Eighteen participants had no educational training regarding nutritional care at all during the last five years.

Limited experience of routine malnutrition screening and the tendency of Internal Medicine department doctors to assess patients' nutritional status mainly in response to visible physical changes, such as significant weight loss or poor overall condition, may be partly due to a lack of structured academic training in clinical nutrition. Without contribution from the NST of the hospital and/or education pathways for healthcare professionals, including nutrition specialists and general clinical staff, consistent knowledge and practice standards in nutritional care are difficult to establish.

4.2. Collaboration with the nutrition support team

Participants described supportive and consultative interactions, multidisciplinary communication, and, to some extent, limited dialogues, which shaped their level of engagement with the team. Findings show that some participants were not aware of the NST service, which is itself a barrier to having team consultation. Dissemination of nutritional care depends on consistent communication with hospital staff and establishing clear collaboration channels. Encouraging participation from all healthcare professionals and providing targeted education will further enhance the effectiveness of nutritional care. Improved communication makes nutritional care a shared priority.

The study's findings indicate that some participants from both the Internal Medicine and ICU departments were not aware of the availability of NST consultations. This gap in awareness may be attributed to insufficient dissemination of information, highlighting the need for improved communication strategies to enhance interdepartmental collaboration.

This finding is similar to the findings of Ottrey et al. (2020), where some hospital staff were unaware of changes in hospital nutrition care. This finding suggests paying attention to increasing awareness of NST service among hospital staff. Building collaborations takes time and evolves gradually (Romano & Minns Lowe, 2022). Introducing interventions in hospital nutritional care relies on staff engagement, communication, and collaboration (Laur et al., 2017; Ottrey et al., 2020). Given that this team is relatively newly established, their integration requires good communication and coordination among various departments to ensure that all clinicians are aware of the services available. Increasing awareness of the availability of NST consultations among hospital staff is important for improving staff engagement in nutritional care and multidisciplinary collaboration.

According to participants' collaboration with the NST, the team was involved in consultations on nutrition support, nutritional care plans and strategies. These findings align with the general functions of the NSTs described in the systematic review by Mistiaen and Van den Heede (2000).

Our findings on collaboration and communication have similarities with previous qualitative studies. At Tartu University Hospital, the NST is the consulting team with a multidisciplinary approach and available to hospital doctors upon request to improve their patients' nutrition support, reduce complications, and shorten hospital stays. 'Formalised nutritional team' is not involved in the care of all patients, as the function of nutritional screening, assessment, and monitoring of nutrition delivery was the responsibility of the hospital doctors and nurses (Barrocas et al., 2023).

Barrocas et al. (2023) and Mundi et al. (2022) highlight the importance of interaction and communication in the progression of NST service. In the 2021 USA survey assessing the NSTs demographics and factors contributing to the success of NSTs, the disbandment of teams was primarily attributed to a lack of healthcare practitioners' interest, insufficient leadership and inadequate financial support (Mundi et al., 2022). A lack of interest among healthcare practitioners may be linked to their level of awareness of the nutrition care process.

Our study participants shared their experiences collaborating with either the entire NST or specific team members, depending on the clinical context. This collaboration aligns with the "ACT" concept introduced by Barrocas (2019), highlighting the importance of accountability, communication, and teamwork in creating a highly effective team. By

working both individually and collectively, team members contribute to a cohesive and functional support system.

Our study findings also indicate that doctors were more likely to describe experiences of collaboration with the NST, whereas nurses referred to having training sessions from the NST. This imbalance may reflect perceptions of roles in hospitals, where decision-making authority is often concentrated among doctors, while nurses primarily focus on maintenance and monitoring. However, it may also point to limited opportunities for nurses to be actively involved in multiprofessional nutritional care planning. The literature addressing the dynamics between doctors and nurses in the NST consultation decision-making was not found. This omission may highlight a gap in the literature concerning multiprofessional collaboration in nutritional care decisions.

The finding that ICU doctors often ask for consultation from the NST during patient transfers reflects a proactive prevention approach to the nutritional gap in post-ICU nutritional care described in the literature (Knudsen et al., 2025; Moisey et al., 2022; Nikolaisen et al., 2023). The ICU participants' concerns about the continuity of nutritional care in Internal Medicine departments resonate with ward nurses' experience on patient safety being transferred from an ICU to a general ward, described as “A feeling of two different worlds” in the Norwegian qualitative study (Nikolaisen et al., 2023). Knudsen et al. (2025) reported a significant decrease in the energy and protein requirements being met after ICU discharge to a regular ward at Copenhagen University Hospital.

Additionally, in the Estonian study by Aro et al. (2012), which explored the needs of adult patients in the ICU using a descriptive questionnaire, nutritional needs were not assessed, as they were not included among the study's objectives. However, this does not suggest a lack of compliance with standard nutritional care requirements. Instead, it may reflect that the topic of nutritional needs was not regarded as a pressing or significant issue. Considering those studies and the findings of the current research, it is evident that nutritional needs and the provision of nutritional care should receive more attention.

Another interrelated important finding is that the Internal Medicine department doctors and nurses expressed a need for assistance from the NST, mainly due to the technical aspects of feeding and complications related to EN and PN, as well as to improve swallowing assessments and nutritional assessments in the regular wards. Generally, NSTs were created in response to the emerging field of nutrition support and the lack of knowledge about this new approach (Mistiaen & Van Den Heede, 2020). This could perhaps be seen in this study, as participants from the Internal Medicine departments

expressed their need for team consultation for “*Parenteral feeding - no overview of how to correct it.*”

The challenges related to swallowing assessments described by participants from the Internal Medicine departments are consistent with findings by Moisey et al. (2022), who identified swallowing difficulties as the most common functional barrier to nutritional intake among post-ICU patients in general wards.

The Internal Medicine participants are concerned about enteral formula selection, which is also described in previous literature as challenging for clinicians to find the appropriate formula for the patient (Escuro & Hummell, 2016; Malone, 2005). This issue could be addressed by the hospital pharmacist and NST. The collaboration and expertise of pharmacists and the NST can enhance nutritional care by providing valuable support to hospital doctors and nurses. This could be supported by Barrocas et al. (2023) argumentation that clinical dietitians' or NST members' expertise in nutritional care makes them integral to assessing patient needs, creating nutrition plans, and monitoring outcomes; they may also take on additional responsibilities such as managing feeding protocols or enteral formulas and parenteral solutions. Such instances are important for team collaboration with regular ward professionals, especially since many general clinicians may be inexperienced in administering nutrition support. In contrast, intensivists in the ICU manage this process routinely, as highlighted by the study participants.

4.3. Roles and perspectives of health professionals in nutritional care

Professional autonomy in clinical nutrition practice was attributed to ICU participants. ICU and Internal Medicine doctors and nurses have a clear division of roles in nutritional care. Doctors assess patients' dietary needs and decide on the nutrition support and delivery method, while nurses monitor the feeding processes. Our findings regarding the roles and autonomy of health professionals in nutritional care from ICU participants resemble Swiss ICU practices described prior to the introduction of an advanced practice dietitian pilot project in 2022 (Vinci & Stocker, 2025). Nutritional management in the ICU is mainly performed by ICU nursing staff and intensivists in Estonian and Swiss ICU practice. Now, Tartu University Hospital has integrated the Nutritional Therapy Centre with the NST.

Kuslapuu et al. (2015) reported the EN underfeeding in the general ICU of Tartu University Hospital, highlighting doctors' decision-making role on EN and nurses' role in feeding provision. To enable nurses in independent decision-making in tube feeding, a nurse-driven enteral feeding protocol was proposed in 2013 (Padar et al., 2017). Our study findings correspond with this evidence; nurse participants used these guidelines and took measures accordingly. This also reflects shared decision-making and multiprofessional collaboration trends in hospital nutritional care, described in Barrocas et al. (2023). However, shared decision-making roles were related only to the nutrition support monitoring process. Our study findings indicate that nurses primarily engage in monitoring while doctors hold overall responsibility for assessing nutritional needs and making nutrition support decisions. In the study on hospital malnutrition prevalence in Estonia, nutritional screening was performed by physicians (Klek et al., 2015). This differs from findings of research by Van Den Berg et al. (2023), where hospital nurses assess protein intake, and when protein consumption falls below 50% of the nutritional goal, they request consultations with dietitians. Their practice demonstrates more opportunities for nurses to participate in nutritional assessment.

Another contrary in nutrition care roles is a Danish University Hospital's nutritional care practice, where "doctors have the overall responsibility for patient processes in the hospital, but in practice they do not have the main focus for carrying out the nutritional practice" (Nielsen et al., 2024) and nurses, nurse's assistant, nurse nutrition expert, head nurse and dietitians are involved in nutritional care along with the NST within each department and nutritional screening, planning and monitoring are mandatory (Holst et al., 2015).

Our study showed that many nurses from Internal Medicine departments expressed a need for a clinical nutritionist in every clinic. In Estonia, the need for clinical nutritionists, as expressed by nurses, aligns with global challenges highlighted in the literature (Mancin et al., 2022), which emphasise the limited use of nurse nutrition specialists worldwide. Estonia has recently taken steps to address this issue through the establishment of education programs for nutritionists and specialists with advanced nutrition training. These programs represent a promising initiative to bridge the gap between the demand for specialised nutritional care and the availability of trained professionals.

The study results are largely consistent with previous studies, reinforcing established trends in nutritional care, particularly highlighting the collaboration with NST. The findings provide context-specific knowledge into Estonian hospital physicians' and

nurses' experiences in clinical nutrition and collaboration. Additionally, results demonstrate carrying out screenings for research trials, the varied awareness levels about NST support availability, differences in consultation needs between the ICU and Internal Medicine departments, and the decision-making processes of doctors regarding team engagement. According to our study, the roles of nurses in nutritional care are limited compared to other hospital practices described in previous studies. These findings further deepen understanding and extend the scope of existing themes in hospital nutritional care practices.

4.4. Study strengths and limitations

4.4.1. Strengths

The study has several strengths. The strength is that the choice of qualitative methodology is responsive to the research aim. The use of a qualitative research design allows for an exploration of the experiences and perspectives of doctors and nurses, uncovering nuances that are not always accessible through quantitative approaches.

The cross-sectional study design with the web-based, self-administered and open-ended questionnaire enabled flexibility in data collection from a diverse group of hospital professionals at a single time point, while allowing participants the flexibility to respond in their own words. This is particularly advantageous for healthcare professionals who may encounter difficulties allocating time for conventional interview processes. Another strength is accessibility. The LimeSurvey platform enhances accessibility for participants, as it is user-friendly and familiar to Tartu University Hospital staff.

The credibility of the data analysis was enhanced by cross-checking the coding process, which involved reviewing and comparing codes to ensure consistency and reduce the risk of researcher bias. The research process was clearly documented, transparent and followed the standards for reporting qualitative research (O'Brien et al., 2014).

Most importantly, focusing on exploring the experiences of doctors and nurses in a hospital setting is valuable in developing hospital clinical nutrition practice.

4.4.2. Limitations

The study has several limitations. First, the present study is limited to the experiences of doctors and nurses of the ICU and Internal Medicine departments and did not capture the perspectives of patients and NST members of the Clinical Nutrition Centre at Tartu

University Hospital. Not all clinics of the Tartu University Hospital were included in the study. Their inclusion would enhance the perspectives on clinical nutrition practice.

The second is limited generalizability. The results are specific to Tartu University Hospital and may not be easily generalisable to other settings. As with most qualitative research, this study aims to provide contextual insights rather than broad generalisability. Another limitation is that the current study could not provide knowledge on barriers to nutritional screening or why nutritional screening is not implemented as a hospital standard practice.

Next are the limitations of using web-based and self-administered questionnaires, such as survey fatigue (O'Reilly-Shah, 2017), which might result in low response rates and questionnaire incompleteness. Hospital staff often face time constraints and may feel overwhelmed by the length of the questionnaire, which can lead to incomplete responses. To address these limitations, the questionnaire was designed to be concise and engaging, clearly stating the study's purpose, estimating completion time, and simplifying questions. Additionally, self-administered, web-based responses may be subject to recall and response bias, and the lack of real-time clarification, which is a limitation to consider in interpretation. Participants were asked to reflect on their interactions related to nutritional care and collaboration with the NST, which may have led to selective or imprecise recollections. However, open-ended questions were designed to encourage narrative responses based on recent or meaningful experiences, which may help reduce the impact of memory-related inaccuracies. Doctors and nurses provided narrative responses grounded in their clinical experiences.

5. Conclusion

1. There is a need to raise awareness among hospital physicians and nurses about available NST consultative support. Strengthening collaborative nutritional care may be supported by the development of clear guidelines and structured communication pathways between healthcare professionals and the NST.
2. There is a discrepancy between current clinical practices and established international guidelines advocating routine nutritional screening of all patients in hospital settings. Nutritional screening is limited to research purposes, not routinely implemented in clinical practice. Strengthening nutritional screening protocols is essential to reduce the risk of malnutrition in hospital patients. Integrating nutritional screening into routine practice is recommended. It may be beneficial to consider the adoption of technology-assisted systems for nutritional screening and to draw on successful models from other regions (e.g., Scandinavian hospitals).
3. There is a clear demand for improved clinical nutrition education, as many physicians and nurses lack training in nutrition over the past five years, despite showing interest. The NST may play a role in providing targeted nutrition education training for hospital doctors and nurses. The role of the NST in providing nutrition education is well-demonstrated in existing practices. Differences in departmental needs—such as those between ICU and Internal Medicine—should be considered when designing targeted training programs to ensure relevance and effectiveness.
4. The limited involvement of nurses in nutritional care decisions suggests an opportunity to promote more inclusive, team-based approaches to enhance collaborative nutrition management. Nurses' engagement in nutritional screening of patients and requesting NST collaboration can lead to earlier detection of malnutrition and promote better teamwork in patient care.

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7. Appendices

7.1. Appendix 1. Kaaskiri

Lugupeetud arst/õde!

Uuringu taust ja eesmärk

Patsiendi toitumuse hindamine, alatoitumuse ennetamine, diagnoosimine ja ravimine on kaasaegse ravi lahutamatud komponendid. Toitmisravi tugimeeskondade ülesanne on toetada tervishoiutöötajaid toitmisravi korraldamisel ja kompleksel lähenemisel.

Antud uuringu "Haiglas töötavate arstide ja õdede kogemused toitmisravi ja koostöö osas toitmise tugimeeskonnaga" eesmärgiks on uurida haiglas töötavate arstide ja õdede kogemusi toitmisravi osas ja koostööst toitmisravi tugimeeskondadega.

Tegemist on Tartu Ülikooli rahvusvahelise kliinilise toitmise magistriprogrammi raames läbiviidava magistritööga. Uuringu tulemusi analüüsitakse ja kasutatakse Gulvira Ospanova magistritöös, mis on planeeritud kaitsmisele 2025. aasta kevadel. Uuringu tulemused võimaldavad välja töötada sekkumisi toitmisravi tõhustamiseks ja arendamiseks.

Kuidas näeb välja Teie uuringus osalemine?

Kui olete nõus oma kogemusi ja mõtteid antud teemast jagama, palume Teil vastata küsimustikule, mille täitmiseks kulub umbes 20 minutit. Küsimustikule oma nime lisama ei pea, kuid palume Teil vastata mõningatele taustaandmeid kirjeldavatele küsimustele. Tulenevalt sellest, et tegemist on magistritööga, mis peaks kevadel 2025 valmima, on vastamise aega neli nädalat, mille järgselt antud küsimustik suletakse.

Teie osalemine selles uuringus on vabatahtlik, küsimustiku täitmisega annate oma nõusoleku uuringus osalemiseks. Teie isikut ei ole võimalik kindlaks teha ning elektroonses küsimustiku keskkonnas ei salvestu Teie e-posti aadress, IP-aadress ega muud isikuandmed. Kogutud andmeid kasutatakse vaid üldistatuna, tulemusi esitletakse magistritöös, teaduskonverentsidel ning teadusajakirjades.

Uuringu on kooskõlastanud Tartu Ülikooli Inimuuringute eetika komitee.

Kui Teil on lisaküsimusi uurimistöö kohta, võite võtta ühendust Gulvira Ospanova või Alastair Forbesiga.

Täna des

Gulvira Ospanova (kaastöötaja)
Telefoninumber: +372 58509623
E-post: gulvira.ospanova@ut.ee

Alastair Forbes (vastutav uurija)
Telefoninumber: +372 7318627
E-post: alastair.forbes@ut.ee

Selles küsimustikus on 13 küsimust.

7.2. Appendix 2. Küsimustik

1. osa. Tausta küsimused

1. Teie amet

Palun valige üks järgnevatest vastustest:

Arst sisekliinikus

Arst anestesioloogia ja intensiivravi kliinikus

Õde sisekliinikus

Õde anestesioloogia ja intensiivravi kliinikus

2. Kui kaua olete oma erialal töötanud?

Palun valige ainult üks järgnevatest:

alla 5 aasta

5-9 aastat

10-14 aastat

rohkem kui 15 aastat

3. Kas olete viimase 5 aasta jooksul osalenud kliinilise toitumise alastel koolitusel?

Palun valige ainult üks järgnevatest:

Jah

Ei

4. Kui jah, siis palun täpsustage koolituste osas, et mis teemadel koolitustel olete käinud ja võimalusel lisage nende kestus (mitu akadeemilist tundi 1 akadeemiline tund on 45 minutit) ja koolituse toimumise aasta

Kirjutage oma vastus(ed) siia:

enteraalne toitumine

.....

parenteraalne toitumine

.....

alatoitumusega patsientide toitumine

.....

toitumise sõelumine

.....

muu toitumise teema

.....

2. osa. Kliiniline toitmispunkt ja kogemused koostööst toitmise tugimeeskonnaga

5. Palun kirjeldage haiglas statsionaarsel ravil viibivate patsientide toitumise uurimine ja hindamise tavapraktikat (millal seda teete, kuidas seda teete). Kirjutage vastus siia:

.....
.....
.....
6. Palun nimetage milliste toitumise probleemidega olete haigla ravil viibivatel patsientidel oma töös kokku puutunud? Kirjutage vastus siia:

.....
.....
.....
7. Kas teie osakonnas või kliinikus on toitumise tugimeeskond ja/või võimalus toitumise teemal nõu küsida? Kui jah, siis palun kirjeldage, millised spetsialistid tugimeeskonda teie teada kuuluvad.

Kirjutage vastus siia:

.....
.....
.....
8. Kas olete mõne haiglas ravil viibiva patsiendi osas pidanud nõu TÜK Toitmisravi keskusega?

Palun valige ainult üks järgnevatest:

Jah

Ei

9. Kirjeldage millistel juhtudel olete vajanud või arvate, et võiksite vajada TÜK Toitmisravi keskuse meeskonna abi? Kirjutage vastus siia:

.....
.....
.....
10. Kui teil on kogemusi, siis palun kirjeldage, mis on läinud hästi/on toimunud koostöös TÜK Toitmisravi keskusega? Kirjutage vastus siia:

.....
.....
.....
11. Kui teil on kogemusi, siis palun kirjeldage, milliseid takistusi olete tundnud koostööl TÜK Toitmisravi keskusega? Kirjutage vastus siia:

.....
.....
.....
12. Milliseid arendusvajadusi näete haiglas viibivate patsientide toitmisravi parendamisel? Kirjutage vastus siia:

.....
.....
.....

13. Muud mõtted või kommentaarid kliinilise toitmisravi teemal, mida sooviksite jagada.
Kirjutage vastus siia:

.....
.....
.....

Täname koostöö eest!

7.3. Appendix 3. Approval from Tartu University Hospital



Tähis VKL-241
Viide PKL-127
Versioon 04

TEATIS EETIKAKOMITEELE / EESTI BIOEETIKA JA INIMUURINGUTE NÕUKOGULE

Tartu Ülikooli Kliinikumi nõusolek uuringu läbiviimiseks

UURINGU ANDMED

Uuringu täielik nimetus: Haiglas töötavate arstide ja õdede kogemused toitmisravi ja koostöö osas toitmise tugimeeskonnaga

Sponsori protokoll number, versioon ja kuupäev:

Vastutav uurija: Gulvira Ospanova

UURINGUKESKUSE ANDMED

Uuringu läbiviimise koht: KV5 - Toitmisravi keskus

KINNITUS

Olen teadlik ülaltoodud kliinilisest uuringust.

Teadus-arendusteenistuse kliiniliste uuringute keskuse juhataja
Katrín Kaarna juhatusel 06.06.2023 nr otsuse nr 1.3-1/117 volituse alusel

Katrín Kaarna
/allkirjastatud digitaalselt/

7.4. Appendix 4. Approval from the Human Research Ethics Committee

Tartu Ülikooli inimuuringute eetika komitee

Protokolli number: 395/T-9

koosolek: 16.11.2024

Komitee koosseis:

Esimees

Aime Keis Tartu Ülikool, eetikakomitee esimees

Aseesimees

Kristi Lõuk Tartu Ülikool, humanitaarteaduste ja kunstide valdkond, projektijuht / doktorant

Liikmed

Diva Eensoo	Tervise Arengu Instituut, teadur
Kalle Kisand	Tartu Ülikool, meditsiiniteaduste valdkond, laborimeditsiini professor
Piret Koosa	Eesti Rahva Muuseum, teadur
Malle Kuum	Tartu Ülikool, meditsiiniteaduste valdkond, farmakoloogia lektor / farmakoloogia teadur
Marje Oona	Tartu Ülikool, meditsiiniteaduste valdkond, peremeditsiini kaasprofessor
Maire Peters	Tartu Ülikool, meditsiiniteaduste valdkond, geneetika kaasprofessor
Raivo Puhke	Tartu Ülikool, meditsiiniteaduste valdkond, funktsionaalse morfoloogia lektor
Atko-Sulhan Remmel	Tartu Ülikool, humanitaarteaduste ja kunstide valdkond, religiooniuuringu kaasprofessor
Anna-Liisa Tamm	Tartu Tervishoiu Kõrgkool, füsioteraapia ja tervisekaitse osakonna juhataja
Anni Tamm	Tartu Ülikool, sotsiaalteaduste valdkond, arengu- ja koolipsühholoogia lektor / arengupsühholoogia teadur
Maarja Torga	Riigikohus, tsiviilkolleegiumi nõunik

Otsus: Kooskõlastada uurimistöö

Uurimistöö nimetus eesti keeles: Haiglas töötavate arstide ja õdede kogemused toitmise ja koostöö osas toitmise tugimeeskonnaga

Uurimistöö nimetus inglise keeles: Exploring the hospital doctors' and nurses' clinical nutrition practice in collaboration with a nutritional support team

Vastutav uurija (asutus):

Alastair Forbes (SA Tartu Ülikooli Kliinikum, toitmisekeskus, L. Puusepa 8, Tartu)

Komitee poolt läbivaadatud dokumendid:

1. Uurimistöö avaldus kooskõlastuse saamiseks Tartu Ülikool inimuuringute eetika komiteelt, 04.12.2024
2. SA Tartu Ülikooli Kliinikum kooskõlastus uuringu läbiviimise kohta
3. Küsimustik, 04.12.2024
4. Uurimistöö läbiviijate CVd (A. Forbes, K. Suija, K.-T. Laisaar)

Uurimistöö lõpp: 31.12.2025

Tartu Ülikool
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Komitee esimees: Aime Keis /allkirjastatud digitaalselt/

Komitee sekretär: Kaire Kallak /allkirjastatud digitaalselt/

Väljastatud: /viimase digitaalallkirja kuupäev/

Selgitus:

- Tartu Ülikooli inimuuringu eetika komitee otsus uuringu taotluse osas ei kohusta isikuandmete või andmekogu vastutavat või volitatud töötajat andmeid uurijale väljastama. Isikuandmete või andmekogu vastutav või volitatud töötaja on kohustatud hindama, kas isikuandmete väljastamine uuringu tegemise eesmärgil ja uurija poolt taotletud viisil on tehniliselt võimalik, lubatud ja vastab õigusaktidele.
- Tartu Ülikooli inimuuringu eetika komitee annab hinnangu planeeritavas uuringus isikuandmete töötlemise suhtes taotluses esitatud kirjelduse ja dokumentide alusel. Uuringus kasutatavate isikuandmete vastutav või volitatud töötaja (vastutav uurija ning uuringumeeskond) vastutab isikuandmete töötlemise nõuetekohasuse ja õigusaktidele vastavuse eest ka siis, kui eetikakomitee on uuringu kooskõlastanud.