



**NEAR EAST UNIVERSITY**

**INSTITUTE OF GRADUATE STUDIES**

**TELEHEALTH PERCEPTIONS AND WILLINGNESS FOR USAGE IN  
POSTOPERATIVE DISCHARGE EDUCATION AMONG NURSING  
STUDENTS**

**DELLIS BONARERI NYAKERIGA**

**MASTERS IN NURSING (SURGICAL NURSING)**

**NICOSIA 2022**

**T.R.N.C**

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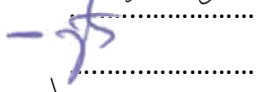
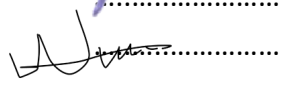
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NICOSIA 2022

## Approval

We certify that we have read the thesis submitted by Dellis Bonareri Nyakeriga titled **“Telehealth perceptions and willingness for usage in postoperative discharge education among nursing students”** and that in our combined opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Educational Sciences.

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### **Declaration**

I hereby declare that all information, documents, analysis and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

Dellis Bonareri Nyakeriga

19/01/2022

## **Dedication**

To my daughter Isabella- Emie Actavia, who may enjoy the best possible health care.

### **Acknowledgement**

I thank the participants of this research who took their time to respond to the questionnaires. I specially acknowledge my supervisor Prof. Dr. Nurhan Bayraktar who has been of great help throughout the course of this work. I am grateful to my friends for their continuous support. The greatest appreciation goes to my daughter and partner who sacrificed their time and my presence, they made this research happen and they deserve the credit.

Dellis Bonareri Nyakeriga

19/01/2022

# **Hemşirelik Öğrencilerinin Tele-Sağlığa İlişkin Algıları ve Ameliyat Sonrası Taburculuk Eğitiminde Kullanımına Yönelik İsteklilikleri**

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**Anabilim Dalı:** Hemşirelik (Cerrahi Hastalıkları Hemşireliği)

## **ÖZET**

**Amaç:** Bu çalışmanın amacı, hemşirelik öğrencilerinin tele-sağlığa ilişkin algıları ve ameliyat sonrası taburculuk eğitiminde kullanımına yönelik isteklilikleri.

**Gereç ve Yöntem:** Bu araştırma tanımlayıcı olarak gerçekleştirilmiştir. Yakın Doğu Üniversitesi Hemşirelik Fakültesi'ne kayıtlı, İngilizce iletişim kurabilen, çalışmaya katılmaya istekli 3. ve 4. sınıf öğrencilerinden 127 kişiye anket uygulanmıştır. Veriler, 1 Ağustos ve 1 Ekim 2021 tarihleri arasında çevrimiçi Kobo araç kutusu tasarım anketi kullanılarak toplanmıştır. Toplanan verileri analiz etmek için İstatistiksel Sosyal Bilimler Paketi (SPSS) yazılım sürüm 21 kullanılmıştır.

**Bulgular:** Lisans öğrencilerinin çoğunluğu telesağlığı hemşirelik için yararlı bir araç olarak algılamakta ve hasta bakımında kullanmayı düşünmektedir. Katılımcıların çoğunluğu telesağlığın avantajlarına yönelik olumlu bir algıya sahiptir. Başlıca avantajlar olarak bakımın etkinliğini artırmak ve hemşire-hemşire temasını kolaylaştırmak olarak ifade edilmiştir. Telesağlığın algılanan dezavantajları ile ilgili olarak, katılımcılar, telesağlığın hasta bakım maliyetini artırabileceğini ve tıbbi personel ile hastaları arasında doğrudan temasın kaybolmasına neden olan teknik sorunlar yaratabileceğini düşünmüşlerdir. Ayrıca bulgular, çoğu katılımcının, hastaların ameliyat sonrası sağlık sonuçlarını iyileştiren telesağlığa olumlu tepki verdiğini göstermektedir.

**Sonuç:** Telesağlık konusu lisans hemşirelik müfredatına dahil edilmelidir. Bu, genel olarak, üniversite tarafından sunulan eğitimin kalitesini artıracak ve daha bilgili ve yetkin hemşirelik işgücünün sağlık kurumlarında yer almasını sağlayacaktır.

**Anahtar Kelimeler:** Telesağlık, ameliyat sonrası eğitim, hemşirelik bakımı, hemşirelik öğrencileri, teknoloji

# **Telehealth Perceptions and Willingness for Usage in Postoperative Discharge Education Among Nursing Students**

**Student's Name:** Dellis Bonareri Nyakeriga

**Advisor:** Prof. Dr. Nurhan Bayraktar

**Department:** Nursing (Surgical Nursing)

## **ABSTRACT**

**Aim:** The aim of the study is to evaluate perception of telehealth and willingness for usage in postoperative discharge education among students.

**Materials and Methods:** This research is a descriptive study, conducted through a self- administered questionnaire to 127 current self- identified 3rd and 4th year student nurses of Near East University who can communicate in English and enrolled in the Faculty of Nursing. Data was collected using online Kobo toolbox design questionnaire between 1st August and 1st October 2021. Statistical Package of Social Sciences (SPSS) software version 21 was used to analyse the collected data

**Results:** Majority of undergraduate students perceive telehealth as a useful tool for nursing and intend to use it in patient. A majority of the participants had a positive perception towards advantages of telehealth. Major advantages were stated as improving efficacy and facilitating nurse to nurse contacts. Regarding perceived disadvantages of telehealth, the participants' felt that telehealth may increase the cost of patient care posing technical problems resulting in loss of direct contact between medical staff and their patients. Moreover, findings show that most participants had a positive response to telehealth improving patients' health outcomes post- operatively.

**Conclusion:** Telehealth programs should be included in the undergraduate nursing curriculum. This will, overall, enhance the quality of education offered by the university and ensure that a more informed and capable nursing workforce takes its place at formal health facilities.

**Key Words:** Telehealth, post-operative education, nursing care, nursing students, technology



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## Abbreviations

Item of Abbreviation	Context
ERAS	Enhanced recovery after surgery

## **CHAPTER 1**

### **1. Introduction and Aim**

#### **1. 1. Definition of the problem**

Globally, forms of telehealth have increased, in both developed and developing countries (Scott & Mars, 2015). More specifically, in countries regularly using telehealth as an active tool, the evidence suggest that this is largely due to a rise in population levels and especially in developing countries (Bali, 2018).

In the recent past, doctors and associated health care professionals had the option to telecommunicate with their patients as an alternative to one-on-one contact in the hospital or clinics (Dinesen et al., 2016). However, these services tended to be available only in urban areas with telephone asses. The lack of telephone communication is given as a reason behind the higher rate of morbidity and mortality in remote areas, notably in developing countries (Marcin, Shaikh, & Steinhorn, 2016). It follows that technological advancement has focused on ensuring population level access to functioning networks (Barclay, Sabina, & Graham, 2014; Dutta, 2009). Furthermore, with continuing advances in medicine, especially in regard to telehealth, the question of ‘health for all’ remains a key if not the most important consideration (Haleem, Javaid, Singh, & Suman, 2021; Stroetmann et al., 2010). Moreover, as studies demonstrate, increasing use of technological devices such as video conference, tablets and mobile phones are being put to good effect in the delivery of health services (Ventola, 2014).

Across the health sector, key players promote the many aspects of health, both preventative and curative and for both the individual and community. Effective collaboration from different departments concerned with health and wellbeing facilitates efficiency, and sustainable quality assured systems of care. Nurses are invariably the patients go-to-person at health facilities, including referral hospitals, interacting with family members and in a critical position to provide information in a timely and sensitive manner (Karimi Moonaghi, Emami Zeydi, & Mirhaghi, 2016). Moreover, it is part of the nurses’ job description to offer patient education during nursing care for both in and out patients (Costello & Thompson, 2015; Karimi Moonaghi et al., 2016). Nurses’ role as health educators has shown great potential in improving levels of patients’ autonomy. (Bergh, Friberg, Persson, & Dahlborg-

Lyckhage, 2015). This essential skill is important as the evidence shows that patients with high level of self-efficacy, tends to have better health outcomes compared to other patients (Kadden & Litt, 2011; Sedig, 2016).

In perioperative nursing, health education is a significant factor to include in the nursing patient care plan. Surgical nurses need to be better equipped in the skills of knowledge transfer and communication given the not uncommon levels of high anxiety and constant questioning among patients regarding their surgical experience (Bailey, 2010). The fact remains that having confidence as a surgical nurse and disseminating efficient and sufficient information will ease the patients' anxiousness and promote better surgical outcome (Alanazi, 2014; Bailey, 2010; Celik & Edipoglu, 2018). The Malley, Kenner, Kim, and Blakeney (2015) study demonstrates the most important part in perioperative nursing is postoperative nursing care. This is because, at this stage, patients have undergone surgery and require special attention. In addition, at this stage of the process, nurses are tasked with disseminating key aspects of the home post-surgical procedure to be carried out by both patients and their families. Research data suggests that, ensuring the correct and accurate delivery of health education will increase patients' knowledge and therefore better patient outcome (Aasa, Hovbäck, & Berterö, 2013; Malley et al., 2015; Ripollés-Melchor et al., 2018).

Koivisto et al. (2020) studies emphasized on the importance of discharge educational in reduction of postoperative complications. Some common post-operative complications include; delirium, fever, anaemia, kidney, thrombosis, cardiac problems, gastrointestinal system complications among others (Stephenson et al., 2020). If nurses are able to deal with these complications through use of discharge education, they might reduce the number of patients being admitted back to the hospital thus reducing cost of treatment for patients (Kripalani, Theobald, Anctil, & Vasilevskis, 2014; Polster, 2015; Sigurdsson et al., 2008). It is important for nurses to ensure that the patients have positive patients' satisfaction. Mainly this is achieved through patients discharge education which equips the patients on the basic knowledge required to manage their conditions post operatively (Waniga, Gerke, Shoemaker, Bourgoine, & Eamranond, 2016).



In order to ensure that health care workers and health care team manage surgical patients effectively, the ERAS protocol was designed two decades ago in Denmark (Jensen, 2019). According to Li et al. (2020); (Ljungqvist, Scott, & Fearon, 2017) characteristics of enhanced recovery post-surgery (ERAS) are an inter health evidenced based holistic approach, patient centred and ensures patients receive sufficient care with minimal time in hospitals,, surgical complications minimized with reduced rates of readmission. At the centre of ERAS health care teams are nurses as the core implementers of ERAS of service delivery (Brown & Xhaja, 2018). ERAS protocols are systematically organised to include all aspect of nursing perioperative patient care (Li et al., 2020). Furthermore, the approach encourages involvement of family members in aspects of patient care. In order for ERAS to be effectively and efficiently disseminated, nurses need to be educated on its various components as highlighted in the protocol (Hübner et al., 2015). For Jensen (2019) there are six concepts of Nursing within ERAS, they include: patients assessment, diagnosis, decision making, reflecting on outcome measures, team leadership and further surgical research.

Concomitantly, patients and their families need to be instructed in ERAS to facilitate effective ERAS management and implementation. As important as it is to engage with health education, it is crucial to note that the mode and way of transmitting the information also matters (Jones, Schilling, & Pesut, 2011). Patients need to receive information in a way that they understand best. In other words, there are various factors to consider when providing information to the patients and family members. Previous studies suggests that persistent communication barriers have caused much harm owing, oftentimes to a simple lack of know-how on how to convey a message and with whom (Jones et al., 2011; Mariza, 2019; Sedig, 2016). For instance, post-operative nurses need to use language that the patient and/or community understands well and will not be a factor for misinformation. In addition, each patient will likely have his or her own individualised educational plan. With this evidence, innovative programs based on and expanding use of Telehealth has been introduced to ensure that health information is conveyed and received with the least chance of misinformation (Alicea-Planas, Pose, & Smith, 2016). Furthermore, due to the COVID- 19 pandemic, hospital access is limited with most patients receiving ERAS

protocol management training via telehealth devices such as mobile phone, and video conferencing devices (Wainwright, 2021)

It is critical for nursing institutions to know the latest developments in global health regarding the various forms of patients' telehealth, including tools and normative guidance so as to promote better surgical outcomes. A review of the evidence highlights fundamental questions, asked of this review, which is the importance of using telehealth to educate patients. Globally nurses are instructed to provide effective and efficient care through health promotion activities tailored to the needs of their patients (Carifa & Goodin, 2011). In surgical nursing, as elsewhere, it is crucial for nurses to provide perioperative education for better patient outcome. The best results are when nurses deploy innovative skills and in line with technological developments in health care over the course of time (Carifa & Goodin, 2011; Logan, 2012). According to previous research findings, involving patients in their own care, and promoting patients' autonomy, the result is very often a faster healing process, especially as it elevates joint decision-making (National Clinical Guideline Centre., 2012; Vahdat, Hamzehgardeshi, Hessam, & Hamzehgardeshi, 2014).

Bailey (2010); (Celik & Edipoglu, 2018) states that patients who require surgery have increased anxiety owing to a confusion of unintelligible messages and lack of information on matters that mean the most to patients (Celik & Edipoglu, 2018). Through skilful use of telehealth procedures, nurses can alleviate this level of preoperative emotional disturbance of fear of the unknown during preoperative teaching drawing on contextualized telehealth models (Alanazi, 2014; McDonald, Page, Beringer, Wasiak, & Sprowson, 2014). In addition, as shown by Bailey (2010) if anxiety is not reduced significantly, many patients will be more vulnerable to ill-health throughout the surgical experience. Preoperative nurses are in a better position to assist in eliminating the triggers of misinformation and a feeling of alienation on the part of the patient through sensitive and timely communication of messages concerning surgery. This fact may relate to the use of effective preoperative educational tools that incorporates a holistic approach of patient care (Lee & Lee, 2013; Selimen & Andsoy, 2011). Telehealth is a good example, based on the evidence, of providing accurate health education and assisting patients become less concerned about surgical procedure.

McDonald et al. (2014) defines pre-operative education as the information received by patients and their families before a surgery takes place. This is mainly done in order to educate the patient and prepare them for what is coming ahead in the short and long term. Previous studies have demonstrated the importance of innovative and proactive nursing education to improve current practices of patient care (Bergh et al., 2015; Seyedin, Goharinezhad, Vatankhah, & Azmal, 2015). Most importantly, nursing education includes sharing reliable and dependable knowledge and wellbeing to patients and their families (Kääriäinen & Kyngäs, 2010; Rankin, Stallings, & London, 2004). According to Seyedin et al. (2015) accurate and timely information disseminated to patients makes them able to make informed choices regarding their health. In addition, nursing education plays a crucial role in discharge self-management care, in that patients are able to take care of themselves post operatively or after being discharged (Bergh et al., 2015; Seyedin et al., 2015). Nursing education aims to achieve health promotion goal to all its clients which will influence their behavior positively (Whitehead, 2004). According to evidence and studies, it is shown that, most patients who receive nursing education regarding their discharge have a high chance of better health outcome as compared to patients who did not receive education (Marcum, Ridenour, Shaff, Hammons, & Taylor, 2002; Syx, 2008).

Student perceptions towards the use of telehealth is important in all clinical settings. Glinkowski, Pawłowska, and Kozłowska (2013); (Poreddi et al., 2021) studies shows that many nursing students have a positive perception towards telehealth (Poreddi et al., 2021). Student nurses form their perceptions of telehealth from different sources including how it is taught in the classroom. Most studies demonstrate the importance of including telehealth in undergraduate studies in order to boost the student nurses' knowledge regarding telehealth (A. Bashir & Bastola, 2018; Lister et al., 2018; Poreddi et al., 2021). Moreover, nursing students feel like using telehealth for patient care plays a major role in ensuring patient safety (Schlachta-Fairchild, Elfrink, & Deickman, 2008). However, a study conducted by Lister et al. (2018) demonstrates that student nurses need to overcome the perceived telehealth problems, in order to be confident in using telehealth.

A study conducted by Adugbire and Aziato (2018) demonstrate that nursing schools in Ghana educate their students sufficiently in developing a surgical patients' post-

operative discharge plan and coupled with building effective interpersonal skills. However, due to high overload of nurses' workload in hospitals, other responsibilities, such as medication administration, are also prioritized. Telehealth, in this context, is a cross-cutting theme in all aspects of the nursing curriculum with the evidence suggesting great potential for improving nursing care and treatment.

An imposing challenge for health care is the Covid-19 pandemic. Nursing students were affected exponentially, especially, as participation in practical hands-on learning was curtailed (Hargreaves, Zickgraf, Paniagua, Evans, & Radesi, 2021). In response, some universities developed online measures to allow student nurses to continue with theory and, to a degree, practical classes (Babbar & Gupta, 2021). From the outset of the pandemic, telehealth has been shown to have many advantages, for example, student nurses were able to follow up on aspects of health care online with their patients (Monaghesh & Hajizadeh, 2020). In addition, health education lessons have been conducted online, especially ways to prevent against the coronavirus and where to seek treatment and vaccines (Goni et al., 2020). Moreover, health workers were able to conduct programs such as those relating to mental health online allowing greater outreach to patients far from health facilities (Q. Yang et al., 2021).

A nursing study regarding telehealth usage was not found in North Cyprus. Examination of the perceptions and willingness of nursing students towards the use of telehealth may have a positive impact for nursing students as well as nurses in producing evidence as to why the use of telehealth is important in improving patient care and effective patient outcome. Information generated about telehealth and its uses, can be included in the nursing department's curriculum.

## **1.2 Aim of the study:**

The aim of the study was to evaluate the perceptions of telehealth and willingness for usage in postoperative discharge education among nursing students. The study asked the following questions:

- What are the perceptions of the student nurses towards telehealth?
- What are the willingness levels of the student nurses for usage of telehealth in postoperative discharge education?

- Is there any relation between descriptive data and perceptions of the student nurses towards telehealth?
- Is there any relation between descriptive data and the willingness levels of the student nurses for usage of telehealth in postoperative discharge education?

## **CHAPTER 11**

### **2. Background**

The use of technology in formal health care has long been recognized as major asset to improving health and wellbeing. With a long history, dating to the 19th century, progress in medical sciences is matched by advances in the design and use of technological applications (Grigsby, Kaehny, Sandberg, Schlenker, & Shaughnessy, 1995). However, the growth of technology in medical practice has been affected due to various factors, such as: expenses involved in installing telehealth devices, running technical devices, low perception rate, and knowledge of using telehealth overall (Woo & Dowding, 2018). Specifically, developing countries are affected more by telehealth utilization having to weigh the option of telehealth costs and costs of providing essential health care to all its population (Combi, Pozzani, & Pozzi, 2016). Moreover, many health care personnel still lack the competent skills to provide a wide range of telehealth services (van Houwelingen, Moerman, Ettema, Kort, & Ten Cate, 2016). Of note, examples abound of hospitals not providing telehealth options to patients with patients advised to return for physical face-to-face follow up care. Furthermore, the evidence shown that many patients are not aware that telehealth can even be part of hospital services and care (Haleem et al., 2021; Linkous & Lustig, 2012). To address this situation, there needs to be improved information flow to patients regarding possible options for accessing health care, such as telehealth.

#### **2.1 Definition of Telehealth**

The World Health Organisation. (2015) defines telehealth as the process of passing information from health workers to patients via use of technological devices. In addition, Catalyst (2018) describes telehealth definition with various concepts such providing patient care, dissemination of health education, health promotion and involvement of patients in care. This can be achieved through the use of devices such as, mobile phones, tablets, video conference, landline, internet, computer, among others. Evidence shows that, by 2025 the usage of telehealth is predicted to grow two-fold reaching \$55 billion people (Bhaskar et al., 2020). Previous studies indicate that, globally, USA has the highest rates of telehealth usage, yet with a concomitant decline in many developing countries, especially, in Africa (Combi et al., 2016).

The literature continues to show benefits of the different forms of telehealth as an efficient, cost effective and safe means especially for patient care in dealing with the COVID-19 pandemic (Monaghesh & Hajizadeh, 2020). Global research shows, previously to the pandemic, hospitals were not prepared to rapidly shift from one-on-one care to telehealth (Knierim et al., 2021; Stroetmann et al., 2010). However, in large part due to the pandemic the take up and roll out of telehealth proved necessary to ensure protection for health care workers and access to patients. Moreover, with the economic, social and psychological impact of COVID-19, substantial barriers prevailed, particularly at the outset, making routine access to health facilities and interaction with health workers challenging if not impossible (K. Singh et al., 2021).

## **2.2 Nursing and Telehealth**

Telehealth involves a wide range of nursing activities focussed on patient care, especially the role of health education, a vital role of nurses (Combi et al., 2016; Rutledge & Gustin, 2021). Health education is an intricate and complex concept that involves health workers conveying health information in a holistic way that is easy to understand to their clients and the community at large (Auld et al., 2020; Hou, 2014). Further, Hou (2014) states that the World health Organisation describes health education as not only providing knowledge but also ensuring that clients' hierarchy of needs are met, and therefore recognizes the importance of patient perceptions of health care.

Of note, nurses' patient ratio may lead to nurses being overworked and facing exhaustion in the workplace. Studies have shown that telehealth assists in reducing working hours for nurses with the concomitant improvement in the quality of health care delivery (A. Bashir & Bastola, 2018; Hughes, 2008). According to Bashir and Bastola (2018) through telehealth a single nurse can have more approximately 15 patients in a day, which is deemed a manageable ratio. Furthermore, this more efficient use of nurses' time has direct impact on addressing the global shortage of nurses.

Globally, it appears that the prevalence of post operative complications increases daily despite post operative health education provided by nurses (Tevis & Kennedy, 2013). According to Woodfield, Jamil, and Sagar (2016) most post-surgical complication often occurs after discharge. Certainly, research by Woodfield et al.

(2016) shows that the rate of readmission after surgery is basically due to complications which otherwise might have been avoided. This raises concerns of whether post operative education for the patient during hospital stay is as effective as it could be in many settings. It is also not clear whether nurses are able to educate patients in a manner they can clearly comprehend. Telehealth, as has been shown, can help address this problem through the provision of health education materials tailored to meet patient's comprehension capacity as well as in a language they can easily understand (Wijesooriya, Mishra, Brand, & Rubin, 2020). The literature suggests that particularly in more developed countries gains are made with follow up care through telehealth along with continuous education on all matters relating to health and wellbeing for discharged patients (Emes, Smith, Ward, & Smith, 2019; Oh, Lee, Yang, Lee, & Kim, 2021).

### **2.3 Benefits of Telehealth**

Equal access to quality assured health is a major part of the sustainable development goals to be achieved by 2030. A holistic approach to telehealth, the evidence proposes, aligned to universal health coverage will go far in solving issues of cost, accessibility and infrastructure that contribute to health inequalities (Baciu et al., 2017). Health inequalities, as laid bare by the global response to the pandemic, continue to give rise to mortality and morbidity and inappropriate postoperative care.

Arguably, prompted by coming to terms with COVID-19, the research shows that most countries are now using and getting better at telehealth services and, therefore, making sustainable progress in ensuring equal health coverage for all patients (Enlund & Vesey, 2019; Stroetmann et al., 2010). Jin, Kim, Miller, Behari, and Correa (2020) demonstrate that telehealth will enable patient access to medical care regardless of the location, lockdown or closure of health facilities. It follows that post-surgery patients will be able to receive post operative care, including virtual platforms, in the comfort of their homes and regardless of emerging pandemics. Furthermore, family members will also benefit from this because of their role as home care providers given that educational benefits of telehealth are far reaching and not only for the patient. Research has repeatedly shown the importance of educating



family members as they have the potential for contributing positively to patients healing (Smith, Saunders, Stuckhardt, & McGinnis, 2013).

## **2.4 Challenges of Telehealth**

With the continuing and in some situations, rapid shift from traditional methods of treatment and care to telehealth, it has been claimed that the challenges of its use are still to be fully researched and settled (Bali, 2018; Breton et al., 2021). Whereas the many advantages are well-noted in the literature it is clear that many health workers have not received telehealth education in the process of building competencies to perform their job, especially in training curriculum (Ayatollahi, Sarabi, & Langarizadeh, 2015; Gajarawala & Pelkowski, 2021). Furthermore, adaptation to promote usage of telehealth remains, arguably, not as rapid as might be expected shaped by patients' little knowledge of the available technology (Alotaibi & Federico, 2017). The evident link between household assets, disposable income and utilizing technological devices, including, as the internet needs further exploring and particularly in low-income countries. Therefore, overall, it is important for research to further address the core issues surrounding telehealth for effective usage.

The policies, and their ethical considerations, surrounding telehealth and health care continue to be debated focussing on the rights and wrongs of 'virtual medicine.' Outside the positive factors of boosting outreach of health care, globally, the point remains that telehealth does not sit squarely, for many, concerning ethical principles of privacy and confidentiality and risk of violation (Hale & Kvedar, 2014; Hall & McGraw, 2014). Indeed, the role of ethics in telehealth and subsequent rules governing its use and regulation remain a contentious area of debate. Further research, especially concerning the nursing fraternity is needed to question of technological progress and alignment with the morality of virtual care – for all.

## **2.5 Telehealth in nursing curriculum**

Much of nursing school curriculum focusses on educating students via traditional forms of daily nursing care activities (Schwartz, 2019). This practice can benefit from new technological advances relevant to the diverse needs of community health (Darvish, Bahramnezhad, Keyhanian, & Navidhamidi, 2014). Some nursing

schools include information technology as part of nursing studies, however, these studies tend to only cover basic computer literacy (F. Singh & Masango, 2020) . As medical science advances so too must practitioner skills to put it into good effect. Frequently, this has entailed health workers having to adjust to their own perception and approach to patient care. The major discoveries in medical science relate, invariably, to use of technology in patient care and treatment. However, many nursing students have difficulties in using telehealth devices because they do not possess sufficient knowledge, at this stage, of the concept or approach and, not surprisingly, lack confidence in its utilization (Pilarski, 2010). Having telehealth in nursing curriculum theory is not sufficient, student nurses need to develop competency skills in their clinical practice using telehealth devices (Masouras, 2016). With most hospitals not prioritizing use of telehealth devices, this can have the effect of student graduating with insufficient clinical practice required for competent discharge of telehealth (Gonen, Sharon, & Lev-Ari, 2016). Pilarski (2010) studies conducted in Canada suggest that all nursing schools should provide compulsory and comprehensive telehealth instruction in all nursing studies. Moreover, teachers, as well as students, need to have at the very least, a working knowledge of telehealth so as to lead on developing competency skills with their students.

## **CHAPTER III**

### **3. Research Plan and Methodology**

#### **3.1 Study Design**

This research is a descriptive study and well suited for examining student nurses' attitude and willingness to use telehealth in post-operative teaching.

#### **3.2 Study Setting**

The study population of this study were student nurses of Near East University Faculty of Nursing in Turkish Republic of Northern Cyprus (TRNC). Near East University was established in 1988. It was the first University in Turkish Republic of Northern Cyprus (TRNC) to have a nursing department. Near East University Faculty of Nursing is the first faculty of nursing in Northern Cyprus. The duration of undergraduate nursing course in Near East University is 4 years while that of masters and doctorate is two and four years respectively.

#### **3.3 Sample Selection**

The sampling procedure was 'convenience sampling'. The sample size was calculated according to Raosoft sample size calculator with 95% of confidence level and 5% standard error: with a minimum of 123 respondents out of 180 Near East University nursing population. This study had a total of 127 research participants who are able to communicate in English (International students). This research focused on 3rd and 4th year nursing students currently enrolled at the Near East University in the Faculty of Nursing, which was founded in 2018.

#### **3.4 Study Tools**

The study was conducted through a self-administered questionnaire to collect data and measure key variables (Appendix A).

The questionnaire is subdivided into three sections each composed of closed-ended questions as follows:

Section 1. This section was developed by the researchers and includes descriptive data of the students and provides the demographics of participants as well

as structural factors relating to sustained use of telehealth. The section is composed of six questions: two questions on demographic profile of each participant such as age and gender; two questions regarding access to computer and internet; one question focuses on identifying how frequent participants use internet; and a question regarding telehealth curriculum in nursing education.

Section 2. This tool is regarding to perceptions of telehealth by nursing students towards use of telehealth. The tool is a self-reported questionnaire developed in Poland by Glinkowski et al., 2013. Based on their research of some fifty- nine studies on telehealth and telenursing, I adapted a scale to suite the context of this study. That is, a 5-point Likert scale with 28 items with four negatively worded items. Guided by the work of Glinkowski et al (2013), I rated participants' responses as strongly disagree (1) to strongly agree (5). The reliability of the questionnaire was established through the test–retest method ( $r = 0.83$ ). The demographic part of the questionnaire included age, gender, whether nursing interns were accessible to computers, the internet, and frequency of internet use per day.

The first question elicits information on the range of devices used in telehealth. This intention is to highlight the importance of device accessibility in terms of telehealth delivery. Three questions are regarding advantages of telehealth and three corresponding questions about disadvantages. This section evaluates use of telehealth in different areas of nursing including specialist fields in order to demonstrate its efficacy across the profession and different work environments.

Section 3 was prepared by the researchers and included three questions regarding student nurses' willingness to use telehealth in order to educate their patients post operatively. The Cronbach's alpha score was acceptable on a range of  $0.8 > \alpha \geq 0.7$ . Students that selected strongly agree/agree were considered to have high scores while students that selected disagree and strongly disagree were considered to have low scores.

### **3.5 Pilot Study**

A pilot study was performed only on third section on ten student nurses after approval from the Near East University Institutional Reviews Board (IRB). Following

feedback for greater clarity from the pilot study, the questionnaire was fit for the study no revision was needed.

### **3.6 Research Ethics**

Ethical approval was obtained from the Near East University Institutional Reviews Board (IRB) to conduct this research (YDU/2021/93-1371) (Appendix B). An informed consent form was given to participants before answering any questions. The informed consent describes the main purpose of the study and in which participation is voluntary and that unwillingness to take part will not incur any negative consequence. Confidentiality and anonymity were highlighted as key to maintaining the integrity of respondents' participation. Participants were informed that results of this research will be used for educational purposes only. In addition, permission was obtained from Glinkowski et al. (2013) to use the form regarding perceptions of telehealth of nursing students (Appendix C).

### **3.7 Data Collection**

Data was collected using the questionnaire between 1st August and 1st October 2021. The questionnaires were administered by researchers on student nurses online using Kobo Toolbox questionnaire design. Completion of the online questionnaire took approximately 10 minutes. The survey was sent via email and social media, significantly, via WhatsApp.

### **3.8 Analysis of Data**

Statistical Package of Social Sciences (SPSS) software version 21 was used to analyze the collected data. The methods used to analyze the data include an analysis of descriptive statistic variables such as frequency and percentages for the categorical variables. The Pearson Chi-Square test was done to determine the differences. When F statistic was significant, the chosen level of significance is  $p < 0.05$ .

## CHAPTER IV

### 4. Results

**Table 4.1: Demographic characteristics of the students (N=127)**

<b>Characteristics</b>	<b>N</b>	<b>%</b>
<b>Gender</b>		
Male	48	37.8
Female	79	62.2
<b>Age</b>		
< 18	4	3.1
18-20	26	20.5
21-29	97	76.4
<b>GPA</b>		
<60%	5	3.9
61%- 74%	23	18.1
75%- 84%	49	38.6
85%- 94%	50	39.4
<b>Access to computer</b>		
No	10	7.9
Yes	109	85.8
Yes, I only use in the library	8	6.3
<b>Access to internet</b>		
No	2	1.6
Yes	95	74.8
Yes, only in school	7	5.5
Wi-fi	23	18.1
<b>Frequency of using internet</b>		
I don't use it at all	1	0.8
Not more than 1hr/day	6	4.7
	24	18.9

2-3 hr/day More than 3 hours/ day	96	75.6
<b>Telehealth in nursing curriculum</b>		
No	65	51.2
Yes	62	48.8

Table 4.1 shows demographic characteristics of the nursing students composed the sample of the study. The highest rate of responders was female who made up 62.2% of the study group. The highest responder's age group was 21-29 (76.4%). The students whose average score is 75%-84% and 85%-94% had a percentage of 38.6 and 39.4 respectively. Only 3.9% of the participants' average score was below 60%.

Most of the students (85.8 %) had access to a computer while only 10 people had no access to a computer. Only 6.3 % of the study participants acknowledged use of internet only in a library with the majority (74.8%) having overall access to the internet through public and private means. Access to internet through Wi-fi was used by 18.1% of the study group and the remaining seven (5.5%) students only used internet in school. Ninety-six students used the internet more than 3 hours/ day.

The participants' response regarding telehealth curriculum in their education was contradicting. Sixty-five participants (51.2%) indicated there was not education while the remaining sixty-two (48.8%) students acknowledged telehealth education in the curriculum.

**Table 4.2: Students' requirements for telehealth (N=127)**

Telehealth devices	Strongly agree		Agree		Difficult to say		Strongly disagree		Disagree	
	n	%	n	%	n	%	n	%	n	%
Landline	30	23.6	41	32.3	35	27.6	8	6.3	13	10.2

Mobile phone	56	44.1	52	40.9	14	11.0	2	1.6	3	2.4
Tablet	48	37.8	57	44.9	15	11.8	2	1.6	5	3.9
Internet	60	47.2	48	37.8	14	11.0	2	1.6	3	2.4
Audio and video conference	51	40.2	49	38.6	22	17.3	2	1.6	3	2.4
Telerobots	37	29.1	25	19.7	44	34.6	10	7.9	11	8.7
Tele- ECG*	33	26	32	25.2	46	36.2	2	1.6	14	11.0

\* Tele-electrocardiogram

Participants' responses in relation to devices required for telehealth showed a distribution among the seven indicator devices (Table 4.2). At least more than a quarter of the study group agreed that tablet (44.9%), mobile phones (40.9%), audio and video devices conference (38.6%), internet (37.8%), landline (32.3%), TV (32.3 %), telerobots (29.1%), and tele- ECG (25.2%) were fundamental devices for telehealth. There was a high rate (47.2 % /60 participants) for those that strongly agreed that internet was an essential requirement. Disagreement percentages were low in all of the items.

**Table 4.3: Students' perception of telehealth (N=127)**

Variable	Strongly agree		Agree		Difficult to say		Disagree		Strongly Disagree	
	n	%	n	%	n	%	n	%	n	%
Do you think that telehealth in undergraduate studies would be useful for future nurses?	67	52.8	40	31.5	16	12.6	2	1.6	2	1.6
Would you like to use telehealth as an additional form of patient care in your future work?	67	52.8	40	31.5	16	12.6	2	1.6	2	1.6
How do you assess the need to introduce telehealth in the	59	46.5	45	35.4	19	15.0	2	1.6	2	1.6



healthcare of your country?					
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Table 4.3 shows participants perceptions of telehealth. The results suggest that the majority of the undergraduate students perceive telehealth as a useful tool for nursing and intend to use it in patient care (Strongly agree: 52.8%, Agree: 31.5). Only two participants disagreed to both usage of telehealth and its inclusion in undergraduate studies. The rate of introducing telehealth in healthcare in the home country for study participants in the research was noticeable at (Strongly agree: 46.5%, Agree: 35.4). Those that disagreed had a lower percentage (1.6 %) than those that were in the ‘difficult to say’ category (15.0%).

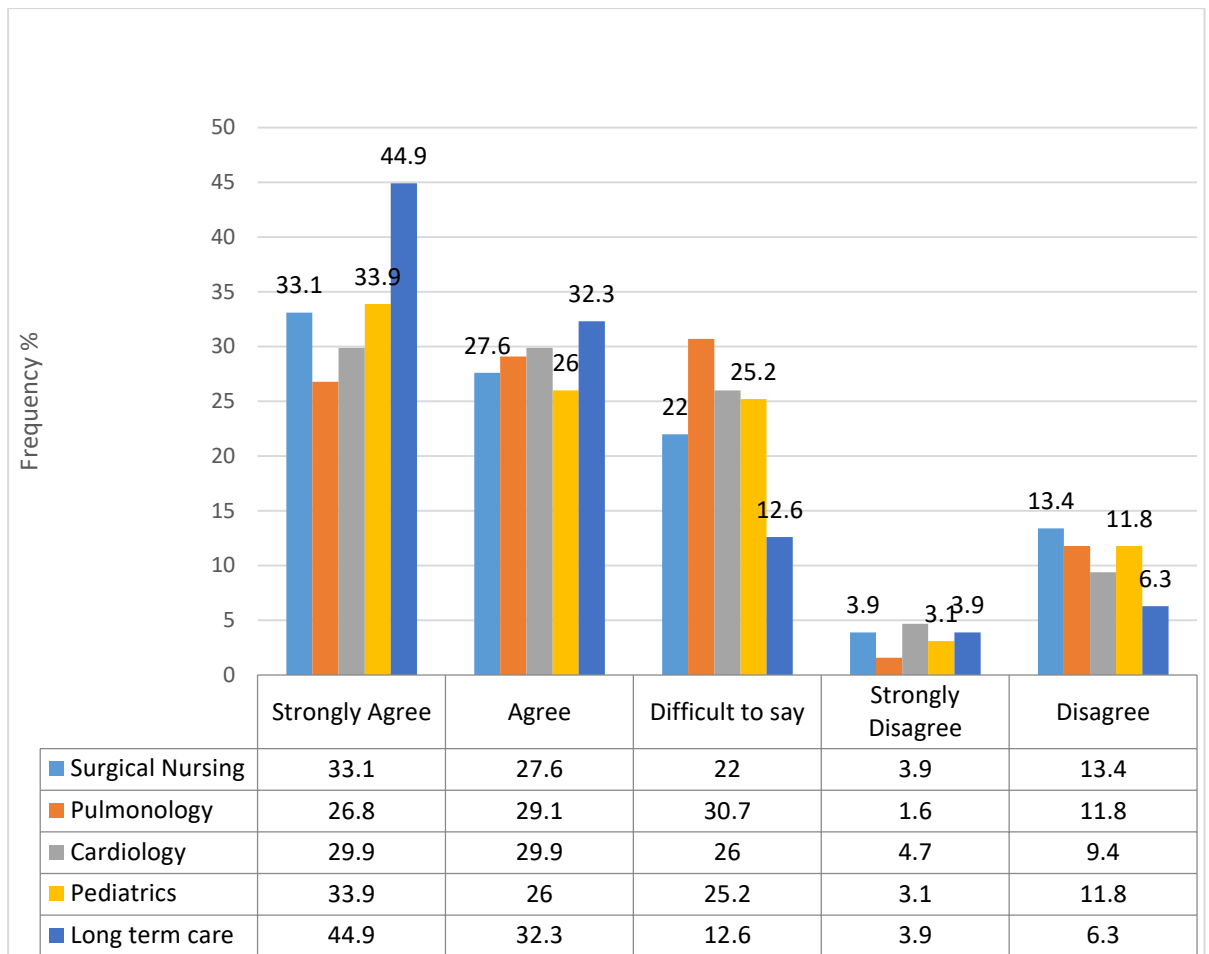
**Table 4.4: Students’ responses to the advantages and disadvantages of telehealth (N=127)**

Variables	Strongly agree		Agree		Difficult to say		Disagree		Strongly disagree	
	n	%	n	%	n	%	n	%	n	%
<b>Advantages of telehealth</b>										
Telehealth can improve the efficacy of the nurses?	66	52.0	45	35.4	10	7.9	3	2.4	3	2.4
Telehealth can facilitate the contact of nurses with patients?	63	49.6	45	35.4	10	7.9	4	3.1	5	3.9
Telehealth has no advantages?	22	17.3	11	8.7	21	16.5	32	25.2	41	32.3
<b>Disadvantages of telehealth</b>										
Telehealth can increase the cost of patient care	32	25.2	33	26.0	29	22.8	18	14.2	15	11.8
Telehealth can cause technical problems	31	24.4	43	33.9	26	20.5	12	9.4	15	11.8
Telehealth may result in the loss of	28	22.0	45	35.4	15	11.8	19	15.0	20	15.7

direct contact between medical staff and the patient					
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Table 4.4 illustrates participants' responses to the advantages and disadvantages of telehealth. The majority of the participants had positive perceptions regarding advantages of the telehealth. More than half of the study group was strongly agreed in regards to both how telehealth can directly improve the efficacy of nursing (Strongly agree: 52.0%, Agree: 35.4%) as well as facilitating nurse-to-nurse contacts (Strongly agree: 49.6%, Agree: 35.4%). It is also noteworthy that the majority of the students were disagree that telehealth had no advantages (Disagree: 25.2%, Strongly disagree: 32.3%).

Regarding disadvantages of the telehealth, results showed that participants perceived that telehealth could increase the cost of patient care (Strongly agree: 25.2%, Agree: 26.0%); can cause technical problems (Strongly agree: 24.4%, Agree: 33.9%); and might result in loss of direct contact between medical staff and their patients (Strongly agree: 22.0%, Agree: 35.4%).



**Figure 4.1: Responses of the students regarding where telehealth can be mostly used in (N=127)**

Figure 4.1 shows the responses of the students regarding where telehealth can be mostly used in. Of note, most responders strongly perceived that telehealth should be used in long- term care (Strongly agreed: 44.9%, Agree; 32.3%) while one- third strongly agreed for its use in surgical nursing (Strongly agree: 33.1%, Agree; 27.6%) and pediatrics (Strongly agree 33.9%, Agree; 26%). At least 29.9 % of the participants agreed to use of telehealth in cardiology, whereas in pulmonology 26.8% strongly agreed and 29.1% agreed to use telehealth.

**Table 4.5: Students' willingness to use telehealth as an educational tool for post-operative patients**

Variables	Strongly Agree		Agree		Difficult to say		Strongly disagree		Disagree	
	n	%	n	%	n	%	n	%	n	%
Would you like to use telehealth to educate your patients post-operatively?	58	45.7	51	40.2	12	9.4	3	2.4	3	2.4
Telehealth may improve patients' health outcome post-operatively	55	43.3	49	38.6	13	10.2	4	3.1	6	4.7
Would you use telehealth post-operative education in order to reduce the rate of readmissions?	58	45.7	49	38.6	9	7.1	3	2.4	8	6.6

Table 4.5 illustrates the willingness of the responders to use telehealth as an education tool for post-operative information and awareness. The highest rate of responders agreed that they would like to use telehealth to educate their patients post-operatively as well as reduce the rate of readmissions (Strongly agree: 45.7%, Agree: 40.2%). In contrast, only three students disagreed to willingness to use for education purposes (Strongly disagree 2.4%, Disagree 2.4%). Most participants had a positive response in relation to telehealth improving patients' health outcomes post-operatively (strongly agree; 43.3%, agree 38.6%).

**Table 4.6 Comparison of the students' students' perceptions and willingness of telehealth with their gender (N=127)**

Variables	Agree/strongly agree answers				P Value
	Male		Female		
	N	%	N	%	
Perceptions					

Do you think that telehealth in undergraduate studies would be useful for future nurses?	38	35.5	69	64.5	0.254
Would you like to use telehealth as an additional form of patient care in your future work?	38	36.2	67	63.8	0.374
How do you assess the need to introduce telehealth in the healthcare of your country?	39	37.5	65	62.5	0.982
<b>Perceptions of advantages</b>					
Telehealth can improve the efficacy of the nurses?	41	36.9	70	63.1	0.620
Telehealth can facilitate the contact of nurses with patients?	40	38.5	64	61.5	0.778
Telehealth has no advantages?	8	27.6	21	72.4	0.403
<b>Perceptions of disadvantages</b>					
Telehealth can increase the cost of patient care	23	35.9	41	64.1	0.797
Telehealth can cause technical problems	27	37.5	45	62.5	0.900
Telehealth may result in the loss of direct contact between medical staff and the patient	23	32.9	47	67.1	0.223
<b>Willingness to use of telehealth</b>					

Would you like to use telehealth to educate your patients post- operatively?	40	36.7	69	63.3	0.549
Telehealth may improve patients' health outcome post-operatively	40	38.5	64	58.7	0.711
Would you use telehealth post- operative education in order to reduce the rate of readmissions?	40	37.4	67	62.6	0.863

Table 4.6 shows the comparison of the average score and significance values within students' perceptions and willingness to use telehealth with their gender. Kruskal- Wallis's test was used to determine P values. Results showed that there was no statistically significant difference ( $p>0.05$ ) in response to all the domains in regard to sex differences.

**Table 4.7: Comparison of the students' perceptions and willingness to use telehealth with their age**

Variables	Agree/strongly agree answers						P Value
	Under 18		18-20		21-29		
	N	%	N	%	N	%	
Perceptions							
Do you think that telehealth in undergraduate studies would be useful for future nurses?	2	1.9	20	18.7	85	79.4	0.098
Would you like to use telehealth as an additional form of patient care in your future work?	2	1.9	20	19	83	79	0.143
How do you assess the need to	2	1.9	17	90	84	81.6	0.047

introduce telehealth in the healthcare of your country?							
<b>Perceptions of advantages</b>							
Telehealth can improve the efficacy of the nurses?	3	2,7	19	17.1	89	80.2	0.030
Telehealth can facilitate the contact of nurses with patients?	3	2.9	19	18.3	82	78.8	0.351
Telehealth has no advantages?	1	3.4	9	31.9	19	65.5	0.393
<b>Perceptions of disadvantages</b>							
Telehealth can increase the cost of patient care	2	3.1	14	21,9	48	75	0.777
Telehealth can cause technical problems	2	2.8	14	19.4	56	77.8	0.938
Telehealth may result in the loss of direct contact between medical staff and the patient	2	2.9	12	17.1	56	80	0.604
<b>Willingness to use of telehealth</b>							
Would you like to use telehealth to educate your patients post-operatively?	3	2.8	20	18.3	86	78.9	0.287
Telehealth may improve patients' health outcome post-operatively	3	2.9	20	19.2	81	77.9	0.698
Would you use telehealth post-operative education in order to reduce the rate of readmissions?	3	2.8	20	18.7	84	78.5	0.390

Table 4.7 shows the comparison of students' perception, and willingness of using telehealth with their age. Kruskal- Wallis's test was used to determine P values. Results showed that there was no statistically significant difference ( $p>0.05$ ) in response willingness to use telehealth , perception of advantages and disadvantages in regards to age differences. However, there was statistically significant difference

( $p=0.047$ ) in relation to students' response concerning introduction of telehealth in their respective countries according to age. Also, there was an observable significant difference ( $p=0.030$ ) regarding telehealth improving efficacy of nurses according to age.

**Table 4.8: Comparison of the students' perceptions, and willingness to use telehealth with their GPA**

Variables	Agree/strongly agree answers								P Value
	<60%		61%- 74%		75%- 84		85%- 94%		
	N	%	N	%	N	%	N	%	
Perceptions									
Do you think that telehealth in undergraduate studies would be useful for future nurses?	4	3.7	20	18.7	41	38.3	42	39.2	0.967
Would you like to use telehealth as an additional form of patient care in your future work?	5	4.8	18	17.1	41	39	41	39	0.784
How do you assess the need to introduce telehealth in the healthcare of your	5	4.8	18	17.3	40	38.5	41	39.4	0.731



country?									
<b>Perceptions of advantages</b>									
Telehealth can improve the efficacy of the nurses?	5	4.5	18	16.2	45	40.5	43	38.7	0.329
Telehealth can facilitate the contact of nurses with patients?	5	4.8	16	15.4	43	41.4	40	38.4	0.211
Telehealth has no advantages?	2	6.9	5	17.2	14	48.3	8	27.6	0.397
<b>Perceptions of disadvantages</b>									
Telehealth can increase the cost of patient care	2	3.1	12	18.8	24	37.5	26	40.6	0.983
Telehealth can cause technical problems	4	5.6	10	13.9	31	43	27	37.5	0.266
Telehealth may result in the loss of direct contact between medical staff and the patient	4	5.7	11	15.7	29	41.4	26	37.1	0.403
<b>Willingness to use of telehealth</b>									

Would you like to use telehealth to educate your patients post-operatively?	4	3.7	19	17.4	44	40.3	42	38.5	0.764
Telehealth may improve patients' health outcome post-operatively	4	3.8	19	18.2	43	41.3	38	36.5	0.460
Would you use telehealth post-operative education in order to reduce the rate of readmissions?	4	3.7	18	16.8	42	39.3	43	40.2	0.893

Table 4.8 shows the comparison of students' requirements, perception, and willingness of using telehealth with their average score in the last 2 semesters. Kruskal- Wallis's test was used to determine P values. Results showed that there was no statistically significant difference ( $p>0.05$ ) in response to all the domains in regards to the average score within the last 2 semesters.

**Table 4.9: Comparison of the students' perceptions and willingness of telehealth with telehealth in nursing curriculum**

Variables	Agree/strongly agree answers				P Value
	No		Yes		
	N	%	N	%	

<b>Perceptions</b>					
Do you think that telehealth in undergraduate studies would be useful for future nurses?	51	47.7	56	52.3	0.166
Would you like to use telehealth as an additional form of patient care in your future work?	51	49.0	54	51	0.512
How do you assess the need to introduce telehealth in the healthcare of your country?	50	48.1	54	51.9	0.291
<b>Perceptions of advantages</b>					
Telehealth can improve the efficacy of the nurses?	56	50.5	55	49.5	0.973
Telehealth can facilitate the contact of nurses with patients?	52	50	52	50	0.866
Telehealth has no advantages?	8	27.5	21	72.4	0.067
<b>Perceptions of disadvantages</b>					
Telehealth can increase the cost of patient care	30	46.9	34	53.1	0.293
Telehealth can cause technical problems	34	47.2	38	52.7	0.410
Telehealth may result in the loss of direct contact between medical staff and the patient	35	50	35	50	0.942
<b>Willingness to use of telehealth</b>					
Would you like to use telehealth to educate your patients post- operatively?	56	51.4	53	48.6	0.572
Telehealth may improve patients' health outcome post-operatively	55	52.9	49	47.1	0.203
Would you use telehealth post- operative education in order to reduce the rate of readmissions?	57	53.3	50	46.7	0.154

Table 4.9 illustrates comparison of the students' perceptions and willingness of telehealth in nursing curriculum. Kruskal- Wallis's test was used to determine P values. Results showed that there was no statistically significant difference ( $p>0.05$ ) in response to all the domains in regards to telehealth in the nursing curriculum.

## **CHAPTER V**

### **5. Discussion**

With recent advancement in systems of health care, technology has proved to be a crucial bridge between the care of patients and health workers. Using technology for postoperative care has contributed positively to efficiency and effectiveness of professional competence (Roberts, Chaboyer, Gonzalez, & Marshall, 2017). Given that hospitals typically may have many patients with long medical histories, keeping track and without medical errors is a constant problem (Alolayyan, Alyahya, Alalawin, Shoukat, & Nusairat, 2020). Dinesen et al. (2016) reported that, telehealth, in its various forms, can prove beneficial in monitoring and recording and in an orderly systematic way. As patient care requires regular communication that provides quality assured information with and between health care providers, technology, correctly used and managed can address this challenge. Moreover, multiple patients can receive education on health care, for example, in video conferencing instead of the traditional form of one-on-one interaction with nurses, that is time consuming and possibly unproductive. With nurses spending more time with their patients than other health workers, the advancement in technology has provided for a more effective nursing practice (Pepito & Locsin, 2019).

Results of the study showed that a majority of the nursing students had access to computer and internet. These study findings are consistent with the study conducted in Lebanon and Pakistan clarifying that most university students have access to computers and internet (S. Bashir, Mahmood, & Shafique, 2016; Helou et al., 2020). In other respects, other studies' results confirm that most students have access to computer and internet, however, they may lack the required knowledge and skills in competent use (Ghaddar, Vatcheva, Alvarado, & Mykyta, 2020; Malhotra, Ramachandran, Chauhan, Soni, & Garg, 2020). Among the study participants, more than half felt that there is no telehealth in the nursing curriculum. This shows low knowledge of student nurses in regards to using technology in their practice. Rutledge and Gustin (2021) studies agree with this study findings that previously, telehealth

was not included in nursing curriculum till COVID-19 pandemic. This fact points to the need for more information technology training included in the nursing curriculum.

Study findings in relation to devices required for telehealth showed out of the 7 telehealth devices including landline, mobile phones, tablet, internet, audio and video devices conference, telerobots, and tele- ECG. Majority of participants believed they were essential devices. As per the study conducted by Dorsey and Topol (2016) access to stable internet is an essential component of efficient delivery of telehealth services. Other studies, agree that mobile phones or smart phones are important because most people or close family members, globally, have access to a mobile phone (Catalyst, 2018; Nadkarni et al., 2020; Price et al., 2013). In addition, this study's results supports that more people will be willing to use telehealth because it does not require purchase of additional devices other than the devices already in their possession.

The majority of the undergraduate students perceived telehealth as a useful tool for nursing, intend to use it in patient care. These results are backed up by previous studies conducted in Poland, Lebanon, and Pakistan that shows more nursing students are willing to use telehealth services to improve the quality of care for their patients' services (Ghaddar et al., 2020; Glinkowski et al., 2013; Helou et al., 2020). Rutledge and Gustin (2021) reported that most nurses are willing to use telehealth in patient care. This study encourages nurses' preceptors to facilitate and encourage student nurses to start using telehealth now in order to be confident in their future work. In addition our finding are consistent to Glinkowski et al. (2013) that shows 70% of the students in a Polish university believe that Telehealth should be included in the curriculum. According to our results, international students are willing to advocate for the use of telehealth in their respective countries. However, many developing countries face structural barriers such as lack of access to stable internet as well as ownership of computer or mobile phones (Dorsey & Topol, 2016).

In this study, the majority of the participants had positive perceptions regarding advantages of the telehealth. They were strongly agreed in regards to both how telehealth can directly improve the efficacy of nursing and facilitating nurse-to-nurse contacts. Previous studies have also demonstrated the advantages of telehealth such as equitable access to health for all, reduction of costs, quality of care, health promotion as an effective educational tool and also patient and health workers safety

(Field & Telemedicine, 1996; Herzer & Pronovost, 2021; Schlachta-Fairchild et al., 2008). Kessler et al. (2016) reach the conclusion that some patients or parents had to miss work and face the possibility of lack of earning to seek medical care. The point to be made is that with telehealth patients have the option of accessing quality assured care in the comfort of their home and/or workplace. In addition, nowadays, there is shortage of nurses globally, made more apparent due to Covid-19 transmissible from one person to another (Turale & Nantsupawat, 2021; Yang, Carter, & Nelson, 2021). Therefore, telehealth can be recommended as an effective method in patient care to prevent transmission of the infectious diseases.

This study notes potential disadvantages of telehealth for both nurses and patients. including increased cost of patient care; technical problems; and loss of direct contact between medical staff and their patients. A study conducted in Australia demonstrates that with increased access to health across the country, more costs will be incurred by the hospitals and patients as part of the process to ensure telehealth effectiveness (Snoswell et al., 2020). However other studies in the USA arrive at different conclusions showing a reduction in costs incurred by patients relating to transportation and access to care (Bynum, Irwin, Cranford, & Denny, 2003; Kessler, Sherman, & Becker, 2016). Telehealth can lead to technical problems especially on devices utilized. Other researches have similar results with the findings of this study in that telehealth requires technical devices that may cause technical issues from time to time (Gajarawala & Pelkowski, 2021; Gogia et al., 2016). A study done in Quebec, Canada shows that technical issues relating to stable internet a prerequisite for telehealth is a factor to be considered (Breton et al., 2021). In addition, loss of direct contact between medical staff and their patients was considered as a disadvantage of the telehealth by the participants. In a study a conducted by Katt et al. (2020) it was indicated that there will be a perceived reduction of one-on-one contact between patients and their health care providers. However, research has shown that face to face contact with nurses has a therapeutic effect (Sibiya, 2018).

Regarding the responses of where telehealth can be mostly used in, results showed that majority of the students agreed about telehealth can widely be used in long- term care, paediatrics nursing, surgical nursing, cardiology and pulmonology. According to previous studies, most patients from various health care departments

require long term care (Hanlon et al., 2017; Seifert, Batsis, & Smith, 2020). This is because patients require daily medication administration, frequent health education as well as follow up call and video from health care facilities to know patients' conditions. This study shows that student nurses are willing to use telehealth as a post operative educational tool for their patients. Taking time to ensure that patients continue to learn aspects of recovery during their perioperative period aids the overall healing process (Catalyst, 2018). Through a concerted program of postoperative education, the patient's ability to self-manage the healing process and diminish chances of reinfection or other complications increases markedly outside of the health facility. As such the quality of life for the patient and those close to the recovering patient continues to improve. Including patients in their treatment and recovery allows greater autonomy during care and respect for decision making (Katt et al., 2020; Sedig, 2016). This study shows, additionally, majority of respondents agreed that telehealth can improve patients' health outcome post operatively and address the persistent problem of readmission of patients into hospital care. This result is supported by studies performed by O'Connor et al. (2016) in the USA and Mechanic, Persaud, and Kimball (2017) in Europe which agrees that telehealth can in fact reduce readmission within the first month of discharge.

In the current study, students' perceptions and willingness of telehealth compared with their gender, age, GPA and telehealth in nursing curriculum. There was no statistically significant between the variables. However, there was statistical significant difference ( $p=0.047$ ) in relation to students' response concerning introduction of telehealth in their respective countries according to age. Also, there was observable significant difference ( $p=0.030$ ) concerning telehealth improving efficacy of nurses according to age variable.

This research findings illustrates that all student nurses perceive usage of telehealth positively and are willing to use irrespective of their gender. However, various studies from the relevant literature showed different results. Regarding gender Amit, Rahman, and Kafy (2021) studies done in Bangladesh, shows that males tend to use telehealth more than females. Another study done in Iran refute our findings by demonstrating significant statistical difference between male and female ( $p=0.02$ ) (Ranjbar, Bakhshi, Mahdizadeh, & Glinkowski, 2021).



A study conducted in India among medical students and health workers agrees with our results regarding age (Malhotra et al., 2020). A study conducted in Libya shows that there was no statistical difference ( $p < 0.001$ ) among age groups, hence, in line with our studies (Elhadi et al., 2021). However, young adults are known to use the internet more than any other age group. A previous study disagree with our findings by showing that people aged between 16-25 use the internet more than other age groups (Amit et al., 2021). Statistically insignificance in our results may be related to the study population age range was between under 18 to 29. However, there was statistical significant difference ( $p = 0.047$ ) in relation to students' response concerning introduction of telehealth in their respective countries with age. Also, there was observable significant difference ( $p = 0.030$ ) when it comes to telehealth improving efficacy of nurses with age.

Average score of students have been shown to influence how students behave perceive various issues. This may shows that, Near East University student nurses are likely to use telehealth and perceive it positively regardless of their academic scores. Glinkowski et al. (2013) studies conducted in Poland disagree with this survey which shows that, average can affect the willingness of student health workers to use telehealth services

Adding telehealth studies in the nursing curriculum will increases the effectiveness and efficiency of patient care for current and future patients (Gallagher-Lepak, Scheibel, & Gibson, 2009; Rutledge & Gustin, 2021). The findings of studies done by Glinkowski et al. (2013) showed significant difference to inclusion of telehealth in nursing curriculum. Majority of similar studies done, agree that even including telehealth in the curriculum will have a positive effect in providing care (Gallagher-Lepak et al., 2009; Poreddi et al., 2021). This finding strongly suggests the necessity of inclusion of telehealth in the nursing curriculum on undergraduate level.

## **5.1 Limitations**

There are some limitations to this study. The major limitation is the method of data collection, which, owing to COVID-19 restrictions, was solely based on an online survey. The study was carried out for Near East University student nurses, therefore,

the evidence base from the findings would have been further strengthened possibly with an expanded cohort of participants.

## **5.2 Conclusion**

The results of this study show that a majority of the nursing students at Near East University perceive telehealth positively. However, notwithstanding that most Near East University student nurses have access to a computer and the internet, and therefore well placed to learn of new technologies, most participants emphasized there was no telehealth studies in their curriculum. The finding shows little knowledge related to usage of information technology in clinical practice. In this regard, most student nurses felt the necessity to include telehealth in their undergraduate studies. With little noted differences in response of participants overall, the university needs to consider how to address this concern. This desire to learn more must be matched with comprehensive telehealth education within the undergraduate nursing curriculum to boost student nurses' confidence as well as provide efficient knowledge required to use telehealth. Based on the findings, they are willing to use telehealth in their future career to educate their patients post operatively. The findings from this study are important as they have the potential to inform and develop an educational plan for future nursing students to ensure essential skills are trained and add to professional competence. Telehealth, as this research shows, is a credible and desirable form of postoperative health care. Not without challenges that can hold back telehealth reaching its full potential, overall, globally, it is having a positive effect in improving health, recovery, and wellbeing.

## CHAPTER VI

### 6. Findings and Recommendations

#### 6.1 Findings

This research is a descriptive study well suited for examining students' attitude and willingness to use telehealth in post operative teaching. The following are findings generated from this study:

This study was composed of 127 participants, 48 (37.8%) were male while 79 (62.2%) were female. The age group of the study was between under 18- 29; however, most responders were in the age group 21-29 (76.4%). Of note is the high response for student nurses whose academic average score over the last 2 semesters was between 75%- 94% (39.0%). Regarding access to internet and computer, majority of the nursing students had access to a computer (85.8%) and Internet (74.8%). Among the study participants, 51.2% believed there is no telehealth included in the nursing curriculum.

Out of the 7 telehealth devices (Landline, Mobile phone, Tablet, Internet, Audio, and video conference, Telerobots, Tele- ECG) measured for this research, most participants believed that internet (47.2%) and mobile phones (44.1%) were essential devices.

Of note is that (Strongly agree: 52.8%: agree 31.5%) respondents strongly perceived advantages with the inclusion of telehealth in undergraduate studies. In addition participants (strongly agree 52.8 %: agree 31.5%) perceived that it was important to use telehealth for patient care. Of the study participants (Strongly agree: 46.5%, Agree: 35.4) responded positively to introducing telehealth in their respective countries.

Regarding the advantages of telehealth, this study findings shows that telehealth can directly improve the efficacy of nursing (Strongly agree: 52.0%, Agree: 35.4%) as well as facilitating nurse-to-nurse contacts (Strongly agree: 49.6%, Agree: 35.4%).

In regard to negative perception of telehealth, some participants pointed to its disadvantages; participants perceived that telehealth could increase the cost of patient care (Strongly agree: 25.2%, Agree: 26.0%); can cause technical problems (Strongly

agree: 24.4%, Agree: 33.9%); and might result in loss of direct contact between medical staff and their patients (Strongly agree: 22.0%, Agree: 35.4%).

Findings relating to where telehealth in nursing can be used revealed that responders strongly perceived that telehealth should be used in long- term care (Strongly agreed: 44.9%, Agree; 32.3%), surgical nursing (Strongly agree: 33.1%, Agree; 27.6%), pediatrics (Strongly agree 33.9%, Agree; 26%), cardiology (Strongly agree: 29.9 %, Agree: 29.9%) and pulmonology (Strongly agree 29.1: Agree: 26.8%).

Findings concerning use of telehealth to educate their patients post- operatively as well as reduce the rate of readmissions showed that (Strongly agree: 45.7%, Agree: 40.2%) study participants were willing to use it. Moreover, this finding shows that most participants had a positive response to telehealth improving patients' health outcomes post- operatively (strongly agree; 43.3%, agree 38.6%).

Comparison of the average score and significance values within students' requirements, perceptions and willingness to use telehealth with their gender, age, average score, and inclusion of telehealth in nursing curriculum showed no statistically significant difference ( $p>0.05$ ). However, there was statistically significant difference ( $p=0.047$ ) in relation to students' response concerning introduction of telehealth in their respective countries with age. Also, there was observable significance difference ( $p=0.030$ ) when it comes to telehealth improving efficacy of nurses with age.

## **6.2 Recommendations**

Nurses play a vital part in educating patients both in preparation for surgery and postoperative care, therefore, it is important for nurses to further knowledge and experience in the adapted utilization of telehealth in health care facilities. This in turn requires that attention is paid by the university to ensure minimum level of competence in working and using different forms of IT. There is a case to argue that telehealth studies should be added as a mandatory component in nursing curriculum given its potential in improving health outcomes and its increasing use globally. Informed and contextually relevant telehealth programs should be included in the undergraduate nursing curriculum. This will, overall, enhance the quality of education offered by the university and ensure that a more informed and capable nursing

workforce takes its place at formal health facilities. Moreover, there is an ethical requirement that students' nurses should have access to the latest thinking and practice in medical science, a responsibility of the university, which in the case of telehealth, has a wide-ranging reach including IT competency and trouble shooting in use of devices required. Furthermore, such instruction should involve constant practical experience and mentoring by university staff to help student nurses gain in confidence and with help at hand learn how to identify malfunction and their remedy. The evidence is strong from various research carried out globally that student nurses are more confident and more willing to use telehealth after attending studying their use during university guided instruction.

Given their noted added value, longitudinal studies should be considered in addition to cross- sectional studies. They are highly effective in relation to examining causality and can ensure clear focus and validity. Larger study group in all North Cyprus should be included in order to represent the total population under study and increase the external validity of the study.

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## **Appendixes**

### **Appendix A**

#### **Questionnaire**

This questionnaire is to be administered to participants upon their consent. The questionnaire is subdivided into three sections each composed of closed-ended questions aligned to 1. Descriptive data of the participant, namely, 2. Telehealth perception of nursing students toward usage of telehealth and 3. Willingness of nursing students for usage of telehealth

#### **INFORMED CONSENT FORM**

I am kindly asking for your voluntary participation in my research project. Please read the following information about the project. Your willingness to return the completed questionnaire indicates your consent to participate in this study.

**Purpose of the project:** The main objective of this research is to examine the attitude and willingness of nursing students towards the use of telehealth in Near east university in North Cyprus.

If you participate, you will be asked to fill a questionnaire regarding the topic. Time required for participation will be approximately 10 minutes. There are no risks involved with your participation in this study. The benefit of this questionnaire is to assist the research team answer the research questions. Privacy will be highly maintained and the information provided will only be shared with the research team for the purpose of the research, no names will be mentioned.

#### **Voluntary Participation:**

Participation in this study is voluntary. If you decide not to participate there will no negative consequences. Please be aware that if you decide to participate, you may stop participating at any time and you may decide not to answer any specific question.

If you have any questions about this study, feel free to contact:

**Student Researcher :**Dellis Nyakeriga  
[dellybon\\_nyake@live.com](mailto:dellybon_nyake@live.com)

**Phone/email:** +905428846456/

**Supervisor:** Prof. Dr. Nurhan BAYRAKTAR  
[nurhan.bayraktar@neu.edu.tr](mailto:nurhan.bayraktar@neu.edu.tr)

**Email:**

## **SECTION 1: Demographic profile**

### **1. Please indicate your gender**

☐ Male

☐ Female

### **2. Please select the category that includes your age**

☐ Under 18

☐ 18-20

☐ 21-29

### **3. Access to computer?**

☐ Yes

☐ No

☐ Yes I only use in the library

☐ Smartphone

### **4. Access to internet?**

☐ Yes

☐ Yes only in school

☐ Wifi

☐ No

### **5. Frequency of using internet?**

☐ I don't use it at all

☐ Not more than 1hour/day

☐ 2-3 h/day

☐ more than 3h/day

### **6. Is there education in your curriculum regarding telehealth?**

☐ Yes

☐ No

## SECTION 2: Participant's perception of telehealth

	Agree	Strongly Agree	Difficult to say	Disagree	Strongly Disagree
<b>Do you need the following items for Telehealth?</b>					
7. Landline phone					
8. Mobile phone					
9. Tablet					
10. Internet					
11. Audio and video conference system					
12. Telerobots					
13. TV					
14. Tele-ecg					

### Telehealth perception

	Agree	Strongly agree	Difficult to say	Disagree	Strongly disagree
15. Do you think that telehealth in undergraduate studies would be useful for future nurses?					
16. Would you like to use telehealth as an additional form of patient care in your future work?					
17. How do you assess the need to introduce					



telehealth in the healthcare of your country?					
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### **Advantages and disadvantages of telehealth**

	Agree	Strongly agree	Difficult to say	Disagree	Strong disagree
18. Telehealth can improve the efficiency of the nurses?					
19. Telehealth can facilitate the contact of nurses with patients?					
20. Telehealth has no advantages?					
<b>Disadvantages of Telehealth</b>					
21. Can Telehealth increase the cost of patient care?					
22. Telehealth can cause technical problems					
23. Telehealth may results in the loss of direct contact between medical staff and the					

patient					
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### Application of telehealth in various nursing specialties and willingness to use

	Agree	Strongly agree	Difficult to say	Disagree	Strongly disagree
<b>Telehealth can be mostly used in?</b>					
24. Telehealth in surgical nursing					
25. Telehealth in Pulmonology					
26. Telehealth in cardiology					
27. Telehealth in pediatrics					
28. Telehealth in long- term care					
<b>SECTION 3: Nursing students willingness to use Telehealth as an educational tool in post operative education</b>					
29. Would you like to use telehealth to educate your patients post operatively?					
30. Telehealth may improve patient health outcome post operatively					
31. Would you use telehealth post operative education in order to reduce the rate of					

readmission?					
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**Appendix B: Ethical approval, Institutional Reviews Board (IRB) of Near East University**



**YAKIN DOĞU ÜNİVERSİTESİ  
BİLİMSEL ARAŞTIRMALAR ETİK KURULU**

**ARAŞTIRMA PROJESİ DEĞERLENDİRME RAPORU**

**Toplantı Tarihi** : 29.07.2021  
**Toplantı No** : 2021/93  
**Proje No** :1371

Yakın Doğu Üniversitesi Hemşirelik Fakültesi öğretim üyelerinden Prof. Dr. Nurhan Bayraktar'ın sorumlu araştırmacısı olduğu, YDU/2021/93-1371 proje numaralı ve **“Telehealth perceptions and willingness for usage in postoperative discharge education among nursing students”** başlıklı proje önerisi kurulumuzca online toplantıda değerlendirilmiş olup, etik olarak uygun bulunmuştur.

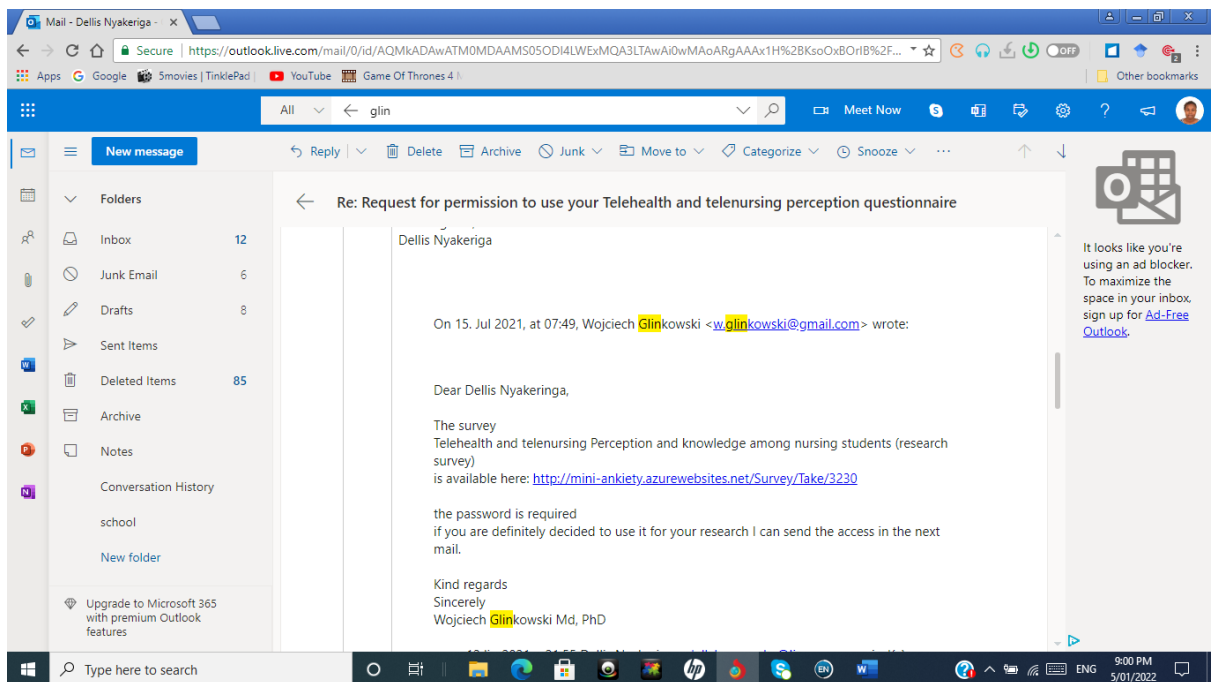
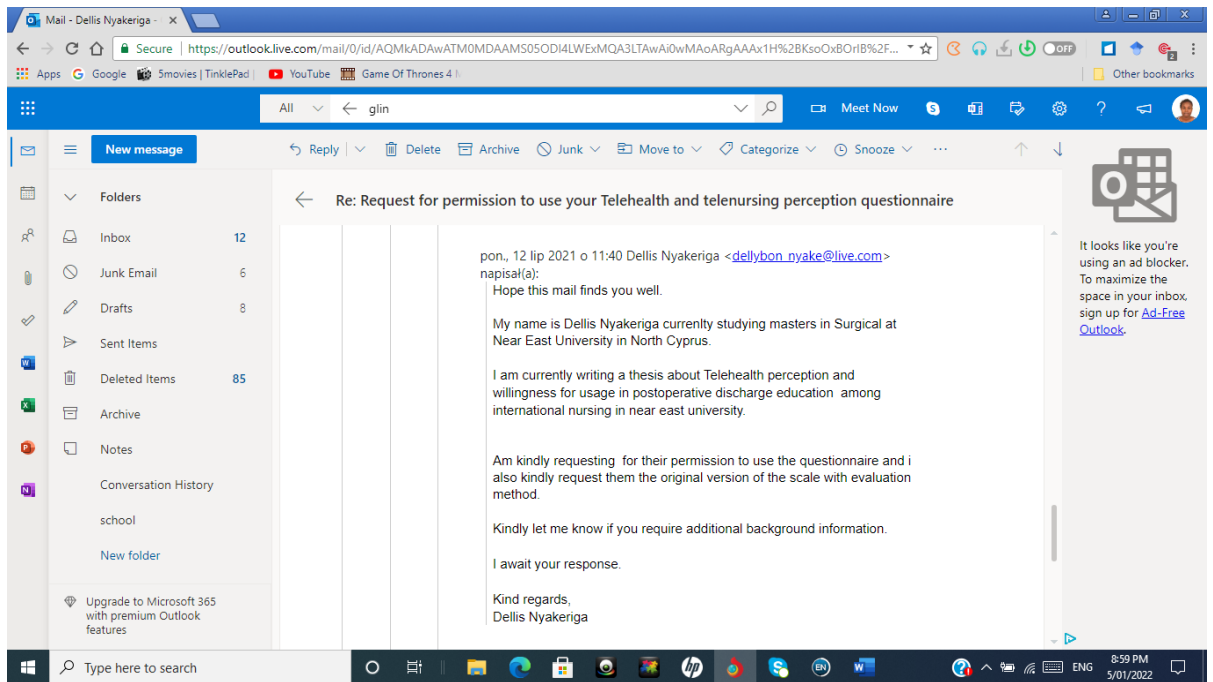
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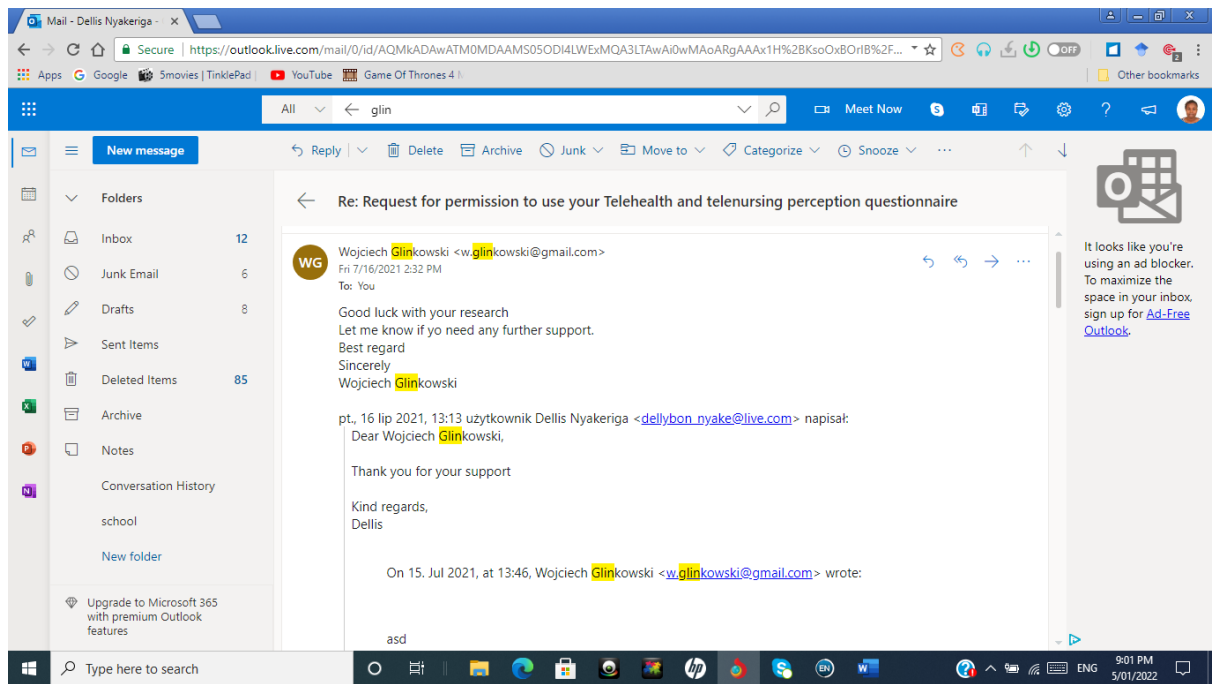
Prof. Dr. Rüştü Onur

Yakın Doğu Üniversitesi

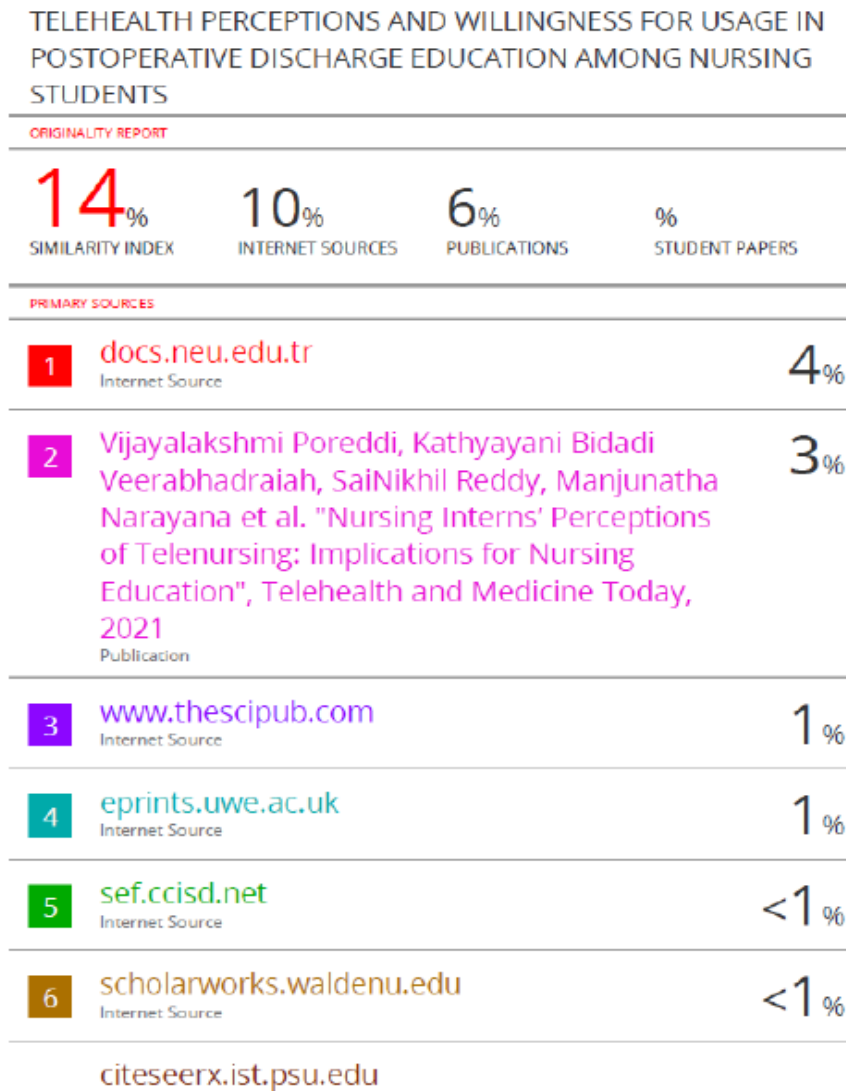
Bilimsel Araştırmalar Etik Kurulu Başkanı

## Appendix C: Permission to use original questionnaire





## Appendix D: Turnitin Report



## CURRICULUM VITAE

Name	Dellis Bonareri	Surname	Nyakeriga
Place of Date Birth	Isiolo, 16\01\1993	Tel	+905428846456
Nationality	Kenyan		
E-mail	Dellybon_nyake@live.com		

### Educational Level

	Name of the Institution	Graduation year
Masters	Near East University	2022
Undergraduate	Cyprus International University	2020
High school	Nyabururu Girls' High School	2010

Foreign Languages	Reading comprehension	Speaking*	Writing*
English	Very good	Very good	Very good
German	good	good	good
Swahili	Native	Native	Native
Turkish	Basic	Basic	Basic

### Computer Knowledge

Program	Use proficiency
Ms Office	Very good
SPSS	good