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TÜRKİYE’DE MOBİL SAĞLIK UYGULAMALARININ HASTA BAKIM SONUÇLARI ÜZERİNE ETKİLERİNİ DEĞERLENDİREN HEMŞİRELİK TEZLERİNİN İNCELENMESİ: SİSTEMATİK DERLEME

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ÖZET:

Amaç: Bu çalışmanın amacı, Türkiye’de mobil sağlık uygulamalarının hasta bakım sonuçları üzerine etkisini inceleyen hemşirelik alanında yapılmış lisansüstü tezleri incelemektir.

Yöntem: Yükseköğretim Kurulu Ulusal Tez Merkezi Veri Tabanı kullanılarak sistematik bir tarama yapılmıştır. Yıl sınırlaması olmaksızın deneysel ve yarı deneysel desendeki tezler çalışmaya dahil edilmiştir. Veri çıkarma ve kalite değerlendirmeleri iki bağımsız araştırmacı tarafından yapılmıştır. Verilerin toplanmasında “Tez Değerlendirme Formu” kullanılmıştır.

Bulgular: Bu çalışmaya toplam 10 tez dahil edilmiştir. Araştırmaya dahil edilen ve mobil sağlık uygulamalarının hasta bakım sonuçları üzerindeki etkilerini inceleyen tezlerde; yaşam kalitesini, semptom kontrolünü, ilaç ve tedavi uyumu artırdığı, emosyonel durumu olumlu yönde etkilediği, anksiyete düzeyini, distres düzeyini, komplikasyonları ve ameliyat sonrası yaşanan semptomları azalttığı belirlenmiştir.

Sonuç: Türkiye’de mobil sağlık uygulamaları ile ilgili tezlerin son yıllarda yapılmaya başlandığı ve hasta bakım sonuçları üzerine pek çok olumlu etkisi olduğu belirlenmiştir. Bu kapsamda mobil sağlık uygulamalarının sağlık bakım hizmetlerinde kullanımının artırılması önerilmektedir.

Anahtar Kelimeler: Hemşirelik, mobil sağlık, sistematik derleme

INVESTIGATION OF NURSING THESES EVALUATING THE EFFECTS OF MOBILE HEALTH APPLICATIONS ON PATIENT CARE OUTCOMES IN TURKEY: A SYSTEMATIC REVIEW

ABSTRACT:

Objective: This study aims to examine the postgraduate theses in the field of nursing examining the effects of mobile health applications on patient care outcomes in Turkey.

Method: A systematic search was conducted using The National Thesis Center Database of the Council of Higher Education. Only experimental and quasi-experimental theses were included without a year limit. Data extraction and quality assessment were performed by two researchers independently. “Thesis Evaluation Form” was used in data collection.

Results: A total of 10 theses were included in this study. In the studies included in the research examining the effects of mobile health applications on the health care outcomes of patients; It has been determined that it increases the quality of life, symptom control, adherence to medication and treatment, satisfaction with education, and positively affects the emotional state, reduces the level of distress, anxiety, complications, and post-operative symptoms.

Conclusions: It has been determined that theses on mobile health applications in Turkey have started to be made in recent years and have many positive effects on patient care outcomes. In this context, it is recommended to increase the use of mobile health applications in health care services.

Keywords: Nursing, mobile health, systematic reviews

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1. INTRODUCTION

Today, mobile devices such as smartphones and tablets, which have become an integral part of daily life, have undoubtedly influenced the delivery of health services [1,2]. The interest in mobile health applications has increased globally because the use of mobile devices in health delivery has increased the quality of care and reduced health care costs [3–5].

Mobile health applications that provide ease of access to the individual at the desired place and time; software for patient monitoring, post-care support, emergency medical response systems, health information systems, health financing, disease and epidemic surveillance, mobile learning, and patient education [5,6]. In addition, these software programs provide benefits such as increasing health literacy and adopting healthy life behaviors [3,7]. For this reason, mobile health applications are used to improve health and facilitate the care process in various patient groups [6].

The research potential is very high because the use of mobile health applications in care areas is new and there is a need for increasing evidence-based knowledge about mobile health applications. In recent years, the number of studies with mobile health applications has increased rapidly in the world and Turkey. In this context, to contribute to the scientific knowledge base of nursing, the theses written on the effects of mobile health applications in the field of nursing have been reviewed and the data obtained from these theses have been systematically examined.

For this purpose, answers to the following questions were sought in the systematic review:

1. Have mobile health applications had an impact on patient care outcomes?
2. If so, what effects does it have?

2. METHOD

2.1. Study design

This study was prepared as a systematic review. This systematic review was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guideline (PRISMA, 2020).

2.2. Search Strategy

An electronic database search was conducted using The National Thesis Center Database of the Council of Higher Education. Searches were performed in April 2022. The key search strings consisted of a concept: mobile health. In this study, first of all, a literature review was conducted to determine the keywords to be used in data collection. The National Thesis Center Database of the Council of Higher Education was searched with the keywords "Smartphone" OR "Smart Phone" OR "Cell Phone" OR "Mobile Phone" OR "Mobile" OR "Application" OR "Mobile Application" OR "E Mobile" OR "E-mobile" OR "E- mobile" OR "mobile health" OR "Mobile care" without year limitation.

2.3. Eligibility Criteria

The inclusion and exclusion criteria of the study were determined according to the PICOS method. PICOS consists of the population (P), intervention (I), comparator (C), outcome (O), and study design (S) [8].

Inclusion criteria:

P: Adult patients receiving care

I: Theses using mobile health applications

C: Theses in which routine care or comparison with a different method is applied

O: Theses in which the results of the care given with mobile health applications are evaluated

S: Theses in experimental or quasi-experimental design made in nursing departments

Exclusion criteria:

P: Theses were conducted with baby and child

C: Theses in which the mobile application group was not compared

O: Theses where the care given with mobile health applications is not evaluated

S: Descriptive studies and theses whose full text cannot be accessed were not included in the review.

2.4. Study Selection

Study citations were compiled manually without the use of any reference management software. The screening and selection of theses were conducted by 2 researchers individually. For the initial search, both authors independently judged the relevance of titles and abstracts identified from an electronic database. In the second phase, both authors checked the study types of all studies. The full text of potentially relevant theses was then retrieved. Both authors assessed these articles against the inclusion and exclusion criteria. Controversial studies and problems were compared and discussed with both authors.

2.5. Data Extraction

Two authors in parallel extracted the data independently and cross-checked. Any disagreements were resolved through discussion. In the study, the "Thesis Evaluation Form" prepared by the researchers was used to determine the characteristics of the theses. The thesis evaluation form consists of two parts. In the first section, the names of the authors of the theses, the year, the type of graduate program, and the department are included; In the second part of the form, the purpose of the thesis study, research design, sample characteristics and size, procedure, measurement tools for evaluating the effectiveness of the mobile application, results/effectiveness of the study are included.

2.6. Data Synthesis and Analysis

The primary outcomes of this review were patient care outcomes. Descriptive statistics were used in the evaluation of the data related to the features in the Thesis Evaluation Form.

2.7. Assessment of Risk of Quality

Two of the authors independently assessed the risk of quality of the included theses. The IJB Critical Appraisal Checklist for quasi-experimental studies and randomized controlled trials published by the Joanna Briggs Institute was used in the quality assessment [9]. One of the quality assessment forms consists of 9 and the other 13 items. Assessments were made on the basis of the response given for each item (Yes, No, Unclear, or Not applicable). The results of the assessment were presented based on the total number of items considered as a "Quality Score" in Table 2.

3. RESULTS

3.1. Search Results

A total of 74520 theses were initially identified from the database; 74397 articles were removed because of not being done in the nursing department. The remaining 123 theses were then screened. We. A further after title and abstract screened 105 theses excluded because of not using mobile health applications. A total of 4 theses were excluded as only the abstracts were

available. After reviewing the full text of the remaining 12 theses, 2 theses were eliminated following the application of inclusion and exclusion criteria. All of the 10 theses were included in the narrative synthesis. A flow diagram of the selected studies is shown in Figure 1.

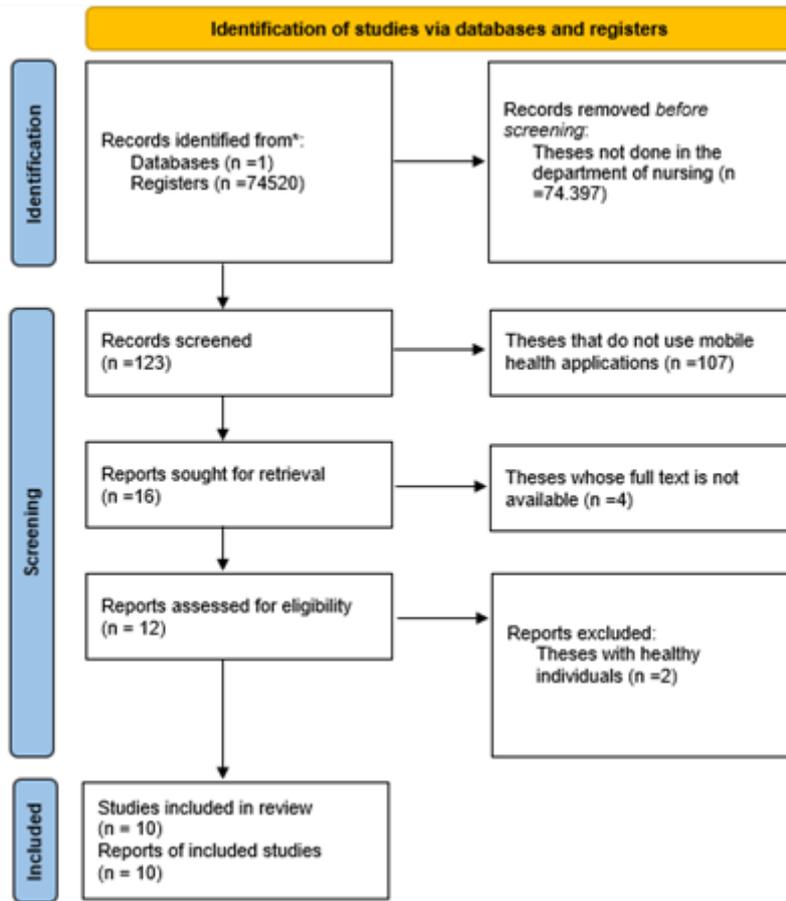


Figure 1. Flow diagram of study selection

3.2. Study Characteristics

Characteristics of the 10 studies are shown in Table 1. The theses included in the review were made between the years 2019-2021. One of the theses was a master's theses and nine of them were doctoral theses. The sample of nine theses is patients (%90) and the sample of one thesis is mothers (%10). The number of samples in theses was at least 29 and at most 124. Six (%60) of the theses included in the review were experimental and four (%40) are quasi-experimental research designs. The data of most of the theses (70%) were collected from university hospitals. 70% of the theses were made with patients who applied to the polyclinic, 20% with patients who were followed up during the surgical process, and 10% with women who were followed up after birth.

Table 1. Distribution of characteristics of included theses

	n	%
Thesis type		
Master thesis	1	10
Doctoral thesis	9	90
Year		
2019	3	30
2020	4	40
2021	3	30
Research design		
Experimental	6	60
A quasi-experimental	4	40

3.3. Intervention Characteristics

In the studies included in the research examining the effects of mobile health applications on the health care outcomes of patients; It has been determined that it increases the quality of life (40%), symptom control (30%), adherence to medication, and treatment (40%), satisfaction with education (10%), positively affects the emotional state(10%), reduces the level of distress (20%), anxiety (10%), complications and post-operative symptoms (10%) (Table 2).

4. DISCUSSION

Today, in parallel with the developments in technology, the use of mobile devices such as smartphones and tablets has increased [5]. According to We Are Social 2021 data, approximately 66.6% of the world's population and 89% of Turkey's population use smartphones [10]. Smartphones and mobile internet, which have been used in all areas of daily life, have taken effect in the provision of health services and various mobile health applications have begun to be developed to increase the quality of care [5,6]. In addition, the social isolation experienced during the pandemic period caused the patients not to meet their information needs. This situation has revealed the importance of the use of telemedicine and mobile health applications. With the increasing interest in mobile health applications and the effect of the pandemic process, the interest in this subject has been increasing globally in recent years [11–15]. In this study, it is noteworthy that nursing theses evaluating the effect of mobile health applications on patient care outcomes have started to be made in recent years.

One of the most widely used studies in evidence-based practice in nursing practice is randomized controlled trials [16]. In this study, it was determined that the majority of theses were experimental designs and randomized controlled studies (60%). It is thought that conducting studies with a high level of evidence for the use of mobile health applications in patient care will contribute to the use of mobile health applications in care based on evidence. In the study, it is seen that the majority of theses were made to evaluate the effectiveness of the education given with the mobile health application in the medical and surgical process in breast cancer patients (40%) [17–20]. This situation can be associated with the fact that cancer patients have a very high need for information at every stage of treatment. Today, patients have started to meet frequently their information needs from the internet. However, information pollution on the internet makes it difficult to reach the right information and even patients may encounter false information that they will be harmed. It has been reported in the literature that cancer patients with high access to correct information have a higher treatment adherence [21,22]. Expert healthcare professionals are the best resource that patients can use to reach correct information. The education provided by mobile health applications prepared by health professionals ensures that individuals can access the information they need without having to have difficulty reaching the health institution. For this reason, the use of mobile health applications in cancer patients, where the treatment and care process is long and variable, has great potential to improve patient care outcomes.

The majority of theses (60%) in this study show that the use of mobile health applications in nursing care increases the patients' quality of life [17–20,23,24]. The results of the study are in line with the literature [11–13]. It is thought that the use of mobile health applications in nursing care increases the quality of life by providing the patients with the ease of accessing the right information at the desired place and time without the difficulty of reaching the health institution. In particular, mobile health applications have greater potential to improve the quality of health care and improve the quality of life for societies with limited access to traditional health care resources [25]. The study shows that the use of mobile health applications is also effective in increasing symptom control (30%) and drug adherence (30%) [18,19,26,27]. This situation can be associated with the reliable information and self-help strategies provided by mobile health applications, and the support of patients to the correct decision-making process and behavioral changes.

4.1. Strengths and Limitations of Studies Included in This Review

Strengths are illustrated as follows: ilk olarak, işe alınan tüm çalışanlar yüksek kaliteli çalışmalarıdır. İkincisi, tezlerin çalışmaya dahil edilmesi, yöntemin kapsamlı bir şekilde anlaşılmasında açık ve yeterli ayrıntı sağladı.

Citing the limitations, the duration of the included studies was relatively short. Only 1 study followed for 6 months [27]. In addition, the fact that the studies included in the study were conducted in a single country limited the diversity of the populations.

4.2. Strengths and Weaknesses of This Systematic Review

It is the first systematic review examining the impact of mobile health applications on health care outcomes.

The language was restricted to English and the country was restricted to Turkey and which reduces the diversity of studies analyzed. In addition, examining the theses with a single database was the weakness of this study.

4.3. Implication of Policy Making and Further Research

The use of mobile health applications in the care process makes it easier for individuals to access accurate and reliable information. The use of mobile health applications increases patient satisfaction and quality of care. Therefore, the use of mobile health applications in the care process should be expanded. However, the number of studies examining the effects of mobile health applications on patient care costs should be increased. In addition, more clinical studies investigating the effects of mobile health applications on patient care outcomes are needed to increase the evidence.

5. CONCLUSION

It has been determined that the theses on mobile health applications in Turkey have started to be made in recent years and have many positive effects on patient care outcomes. In this context, it is recommended to increase the use of mobile health applications, which provide ease of access to accurate and reliable information in the care process, in health care services. In addition, it is recommended to increase the number of studies with a high level of evidence evaluating the patient care outcome of mobile health applications in different patient groups.

Table 2. Theses included in the systematic review

Thesis type/year/author	Aim	Sample	Research Design	Sample size	Procedure	Measurement Tools	Impact of mobile health application	Quality Score
Doctoral thesis/2019/Çınar D.	The aim of this study was to determine the effect of e-mobile education given to women diagnosed with breast cancer receiving adjuvant endocrine hormone therapy on their quality of life.	Cancer patients	Experimental study RCT	Application group=31 Control group=33	In the study, the patients in the application group were given e-mobile education for three months, and a phone call was made every 15 days. The data of the study were collected in the 1st and 12th weeks of the study.	-Patient Introductory Information Form -FACT-ES Quality of Life Scale -NCCN Distress Thermometer	It was found that the quality of life of the patients in the application group at the end of the 12th week was higher than the control group, and their distress levels were lower ($p<0.05$).	11/13
Master's thesis/2019/Uzgör F.	The aim of this study was to evaluate the effect of a mobile application developed for subcutaneous anti-TNF drug compliance of on drug compliance.	Ankylosing spondylitis patients	A quasi-experimental research	Mobile application group=16 Education booklet group=13	In the study, the mobile application, which includes the follow-up and information about the anti-TNF drug application and management, was installed on the phones of the patients in the mobile application group. The patients in the other group were given an education booklet containing the same information.	-Individual identification form -Bath Ankylosing Spondylitis Disease Index -Bath Ankylosing Spondylitis Functional Index - Ankylosing Spondylitis Quality of Life Questionnaire -Morisky Medication Adherence Scale	It was reported that the patients in the mobile application group had higher drug adherence at the end of the 6th week compared to the training booklet group ($p<0.05$).	8/9

					The data of the study were collected before and 6 weeks after anti-TNF drug application.	- Subcutaneous Anti-TNF Treatment Adherence Questionnaire		
Doctoral thesis/2019/Sözeri Öztürk E.	The aim of this study was to determine the effect of symptom monitoring process with mobile application on symptom control and quality of life in	Cancer patients	Experimental study RCT	Intervention group=28 Control group =29	In the study, patients in the intervention group reported symptoms starting from the first day they received chemotherapy and up to the 15th day after chemotherapy with the mobile application. After the evaluation of the patients' daily symptom reports, the practices they should do for their symptoms were sent to the patients by text message. The data of the study were collected every week for 8 weeks.	-Patient Descriptive Information Form -ECOG Performance Status Scale -Memorial Symptom Assessment Scale -EORTC QLQ-C30 quality of life questionnaire -QLQ-BR23 Module	After the application, the median of the Memorial Symptom Assessment Scale-physical subscale score of the patients in the control group was found to be statistically significantly higher than in the intervention group ($p<0.05$). It is also found that, after application, the medians of the EORTC-QLQC30 quality of life questionnaire, symptom scale, and nausea-vomiting score as well as the medians of the QLQ-BR23 Module sexual function and sexual pleasure subscale score	10/13

							are statistically significantly higher than patients in the intervention group ($p<0.05$).	
Doctoral thesis/2020/Karaaslan Eşer A.	The aim of this study was to determine the effect of the mobile application (OKTED) developed for patients using oral anticancer drugs in cancer treatment on drug adherence and symptoms.	Cancer patients	Experimental study RCT	Intervention group=38 Control group=39	In the study, the patients in the intervention group were followed for 6 months with the OKTED mobile application, which consists of information on oral anticancer drugs, symptom-specific recommendations, and a question-answer module. The data of the study were collected at 0, 1, 3, and 6 months.	-Patient Information Form -Oral Chemotherapy Adherence Scale -Memorial Symptom Assessment Scale	As a result of the research, it was determined that the mobile application was effective in symptom management, and increasing adherence to treatment ($p<0.05$).	10/13
Doctoral thesis/2020/Koçak V.	The aim of this study was to examine the effect of postpartum mobile support application on mothers' anxiety levels and depression symptoms.	Postpartum women	Experimental study RCT	Experimental group=62 Control group=62	In the study, the experimental group patients were provided with support and counseling via the postpartum mobile support application (BebekveBiz). The data of the study were collected on the first postpartum day and six weeks later.	-Information Form -STAI State and Continuity Anxiety Scale -Edinburgh Postpartum Depression Scale	It has been determined that mothers using mobile support application alone is not sufficient for anxiety level and depression symptoms ($p>0.05$).	11/13

Doctoral thesis/2020/Aydın A.	The aim of this study was to determine the effect of mobile-based care support application on symptom management and quality of life of patients undergoing breast cancer surgery.	Cancer patients	A quasi-experimental research	Intervention group=30 Control group=30	In the study, A mobile-based care support system was applied to intervention group patients. The data of the study were collected before the operation, at the discharge, and at the 1st month after the discharge.	-American Shoulder and Elbow Surgeons -Visual Analogue Scale -Beck Anxiety Inventory -Sexual Adjustment and Body Image Scale -Functional Assessment of Cancer Therapy-Breast Cancer Scale	It has been determined that the mobile-based care support application is effective in reducing the symptoms of the patients during the surgical treatment process and increasing their quality of life (p<0.05).	9/9
Doctoral thesis/2020/Toğluk Yiğitoğlu E.	The aim of this study was to evaluate the effect of using mobile health application in stoma care education on the individual's compliance with the stoma and the development of peristomal skin lesions.	İndividual with stoma	A quasi-experimental research	Experimental group=30 Control group=30	In the study, STOMA-M mobile health application education was given to the patients in the experimental group. The data of the study were collected before the operation, in the 1st and 3rd months after the operation.	-Individual Characteristics Diagnosis Form -Adaptation Scale for Individuals with Ostomy -Peristomal Skin Lesions Assessment Tool -The Stoma Care Training Evaluation Form	It was determined that the patients in the experimental group had significantly higher ostomy adherence, stoma care status, and satisfaction with education compared to the control group (p<0.05).	7/9
Doctoral thesis/2021/Kaya A.	The aim of this study was to determine the effect of exercise programs performed via a mobile	Patients with Chronic Obstructive Pulmonary Disease	A quasi-experimental research	Experimental group=38 Control group=38	In the study, experimental group patients were followed with a mobile application containing exercise programs for 10 weeks. The data of	-Patient Information Form -Sit-Up Test -Modified Borg Scale -Medical Research	It has been determined that the exercise programs performed through the mobile application have	9/9

	application on the quality of life and dyspnea level of individuals with COPD.				the study were collected at 0 and 10 weeks.	Council (MRC) Chronic Dyspnea Scale -Saint George Respiratory Questionnaire	a positive effect on the quality of life and dyspnea levels of patients with COPD (p<0.05).	
Doctoral thesis/2021/ Salman F.	The aim of this study was to evaluate the effect of using e-mobile information application developed for pre-and post-breast cancer surgery on patients' anxiety, distress, and quality of life.	Cancer patients	Experimental study RCT	Intervention group=42 Control group=40	In the study, e-mobile information was given to the patients in the intervention group for one month during the operation period. The data of the study were collected one week before the operation and 3 weeks after the operation.	-Patient Descriptive Information and Follow-up Form -HAD Anxiety Subscale -NCCN Distress Thermometer -FACT-G Quality of Life Scale	After using the mobile application, the patients in the intervention group had lower anxiety and distress scores than the control group (p<0.05).	10/13
Doctoral thesis/2021/ Yazgan EÖ.	The aim of this research was to determine the effect of the "Crohn Mobile" application created for Crohn's patients on the quality of life and drug adherence of the patients.	Crohn's patients	Experimental study RCT	Intervention group=33 Control group=32	In the study, the patients in the intervention group were provided to use the Crohn mobile application for two months. The data of the study were collected at 0 and 2 months.	-Patient Identification Form -Harvey-Bradshaw Index Medication Adherence Report Scale -Inflammatory Bowel Diseases Quality of Life Scale	The use of "Crohn Mobile" did not affect patients' bowel symptoms, systemic symptoms, and social functions (p>0.05). However, it was determined that the patients' emotional status, quality of life, and drug adherence were positively affected (p<0.05).	10/13

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