Review Article

Tele-nursing strategies in Iran: A narrative literature review

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Abstract

Introduction: Tele-nursing is a modern way of promoting quality of nursing care, treatment outcome, reducing medical costs and the need for visits, patient and family involvement in decision making, and careful patient monitoring by using all kinds of technologies. The aim of this article was to determine the most popular method in Iran and the potential reasons.

Methods: In this narrative literature review, PubMed, Science Direct, Google Scholar, SID, and Nindex were searched for full texts of Iranian studies published in English or Persian by using the descriptors of Tele-nursing, MHealth, nursing care, Tele-care, and follow-up with phone calls between 2010 and 2020. The search found 472 articles and after considering the eligibility of articles, 56 articles were included.

Results: The review found that 74% of papers used the telephone for telenursing and the second popular method was short message service (SMS) followed by internet and smartphone software.

Conclusion: Telenursing includes many methods that nurses can use for distance nursing care which is not limited to telephone or SMS. In Iran, about 68 million people have a smartphone and have access to the internet. Nurses can use this potential capacity to improve nursing care.

Keywords: Telenursing, MHealth, Nursing care, Telecare, follow-up with phone calls

Introduction

Nurses are at the first line of communication with patients in health care systems through planning, coordinating, providing, and evaluating care (1). Nursing improves the quality of the health care. One of the best methods to reach this goal, is Tele-nursing (2), which has commonly been used since 1980 (3).

Tele-nursing is a subset of tele-medicine (4) and the most important way for reaching modern nursing care, to improve the quality of care and quick access to nursing care services by overcoming geographical barriers (5) which it focuses on patients' long-term wellness and health as well as empowerment of nurses with the opportunity of educating, follow-up and family support through using

communication technologies such as telephones, short message service (SMS), e-learning tools, e-mail (6) and smartphone software (7).

The telephone is the most popular communication tool used in the developed countries due to its cost-effectiveness (3) and easy accessibility (8). Research indicated that telephone consulting is an alternative to in-person visits for providing support and affect behavior changes (9) which it is an effective medium to facilitate the care of chronic patients as well as increase patients' self-care ability by offering medical support and information (10) and by monitoring calls (11).

SMS is one of the mobile phone services (12) and another way of tele-nursing, this method is an interactive service, simple, fast and confidential way for enabling users to send and receive text messages to and from mobile phones and allows rapid reception and reply at low cost (13). Research on SMS in health care services have been focused on two main areas: behavior change interventions and reminders, which can also lead to behavior changes (14).

The computer is another useful device for tele-nursing that can be used for online or offline nursing care. Multimedia CD-DVD is an offline method that transfers education information by Compact Disk (CD) or Digital Video Disk (DVD). The advantages of this method are individual training and no restrictions on the time and duration of the training (15).

There are many types of online methods that can be used by nurses. For example, e-learning is a teaching method based on the web that includes decentralization of the teaching process and individualized learning, flexible access at any time or place, promotion of active learning and can be done by many electronic devices (16, 17).

Education software is another method for tele-nursing which has affected families life after the advent of computers and the growing expansion of communication technology and has the ability to transfer medical information like voice, movie, image, and animation (4). It can facilitate data collection and processing for nurses, extend nursing care standards and help nurses for better decision-making (18).

E-mail, as another mode of tele-nursing, has been used for data collection (19) and interview (20). For instance, Kawaguchi and colleagues (in 2004) have used email and video-email for information collection by filling a visual analog scale from and a USB-connected PC camera record, they concluded that this kind of tele-nursing can improve patient's

condition (21). In the pilot study conducted by Souza-Junior, it is found that tele-nursing interventions can achieve important results as a way to improve patients' health condition (22). In addition, in a systematic review done by Ghoulami Shilsari and colleagues (in 2019) tele-nursing has been introduced an effective method in nursing performances and promoting self-care of patients (2).

Currently, the penetration rate of mobile phone subscribers in Iran has been announced 91.2 with the population of 7.1 million people and considering the above index, it can be concluded that there are now more than 68 million mobile phone subscriptions in Iran (23). According to Tehran Times, the number of broadband internet subscribers until the end of september 2018, was about 61 million people with mobile internet access (24).

Previous studies have categorized mobile usage in three groups: 1- Usage by students and health workers, 2- The risk of mobile usage and its wave impact on humankind and animals, 3- Mobile usages for health improvement interventions (25). Also, studies showed that tele-nursing can effectively improve the outcomes of various diseases such as asthma (26), diabetes (27), insomnia (28), hypertension (29), and some mental disorders such as anxiety (30) and depression (31). Ajalli and Fallahi Khoshknab have evaluated the outcomes of tele-nursing through a systematic review in 2015 (32) and reported that there was not any study about its strategies. So, the objective of this study was to provide a narrative review of tele-nursing strategies in Iran and to find the most popular methods and its potential reason for the method selection.

Materials and methods

Search strategy

An extensive literature search was conducted in May 2020 using the PubMed, Science Direct, Google scholar, SID, Nindex. This review was limited to studies that have been done in Iran between 2010 to 2020 in English or Persian language. Inclusion criteria were studies available in full texts, evaluating the use of tele-nursing as a nursing care. Exclusion criteria were using communication technology in a non-nursing care, letters to the editor, qualitative and, and review articles. Both randomized control trials (RCTs) and non-RCTs were included. The tele-nursing strategies, databases, search items, inclusion and exclusion criteria can be seen in Table 1.

Table 1. Search strategy

Tele-nursing strategy	Database	Search terms	Inclusion criteria	Exclusion criteria
-Tele-nursing -MHealth -Nursing care - Telecare -Follow-up with phone calls	PubMed Science Direct Google Scholar SID Nindex	All (*tele-nursing and Iran* OR *telecare and Iran* OR *follow up with phone calls and Iran* OR *mHealth and Iran*) AND all(*nursing care*) In English and Persian	- Available in full-texts - Evaluating the use of tele-nursing as a nursing care	- Using communication technology, a non-nursing care - Letters to editor - Qualitative and review ones

Titles, abstracts, and reference lists of the selected studies were also reviewed to examine other potential relevant studies. First, all the titles and abstracts were reviewed for relevance to the topic and to see if they met inclusion criteria. Second, the studies were read and categorized by methodology, tele-nursing, used strategy, goal, and outcome of each study (Figure 1). The initial search found 472 articles which after removing duplicated articles and non-relevant ones, 56 articles met inclusion criteria after full-text review.

Characteristics of studies reviewed

Author, year, sample size, type of intervention, Study design, goal, and outcome were extracted to describe the characteristics of the paper (Table 2). The number of articles has increased over time and the peak of publication on this topic was 2016-2017 (35.72%) and 48.21% of studies were designed as RCT. Investigation of nearly 53.5% of articles was implemented in 3 months, 21.4% in 2 months and the investigation time for other articles differed from 3 days to 10 weeks. Method of 66% of the articles was only follow-up after an educational or empowerment program, 12.5% follow-up with education or consultation and 21.5% education, consultation or notification (Table 3). The most common methods of tele-nursing were telephone, SMS and software, respectively (Table 4)

Discussion

Tele-nursing is considered as informational and communicational technology, which can be provided by variety of technologies like telephone, SMS, video, email and internet. The result of this narrative literature review demonstrated that tele-nursing is a good and economically attractive method for nursing goals of monitoring, educating, follow-up and empowerment of patients. Furthermore, the most popular strategy for using tele-nursing in Iran was telephone (74%), probably because of the ease of use among the elderly who often have difficulty working with internet-requiring devices. Despite having national social messengers such as Soroush, Eitaa and bale, the only social messenger that has been used for tele-nursing in Iran is Telegram, which is not available for all because of filtering. There was no study using Email in Iran.

Despite the high capacity for sending educational programs to families and nurses and consulting them (33), Hawkins (in 2018) used email for nursing interviews and concluded that it may increase the dependability and confirmability of findings (20). In another study, Kawaguchi used email as an intervention for improvement of chronic conditions (such as blood pressure and blood glucose) and reported the usefulness of this method (21); however, in Iran, this method has been ignored, maybe because email needs computer access, consistent internet connectivity and the most important reason would be the fact that communication through email is not possible for many elder people in Iran.

Methods of tele-nursing in Iran

The follow-up after an educational or empowerment program in Iran, was the most popular method for tele-nursing (66%) (Table 3). It provides training, monitoring, data collection, monitoring care and protection of patients against side effects of medications and chronic conditions with the follow-up, as a necessary part of nursing care of patients and their family without time and place restrictions (34).

Limitations

Studies were only selected from full-text articles that were accessible to inspect in Iran which may have restricted the results.

Conclusion

Tele-nursing is one of the best ways for helping patients even in rural areas and improving the level of nursing care services, but it is not limited to telephone; so, for better utilization of tele-nursing, it is recommended to use another kind of technologies as well. It is suggested to make the best utilization of the wide range of mobile and internet access among Iranians by native social messengers and smartphone software.

Acknowledgement

Conflict of interest

The authors declare that they have no conflict of interest with respect to the research, authorship, and/or publication of this article.

The tele-nursing education by consultation or notification in Iran has used by phone in most of the studies (3). The health calling system through which the patients receive weekly or monthly calls from nurses is considered as a useful method of treatment in chronic diseases in an effective treatment outcome, better health status, development of patients-nurse communication, and overcome the wasting time and distance problems to provide better nursing cares (35).
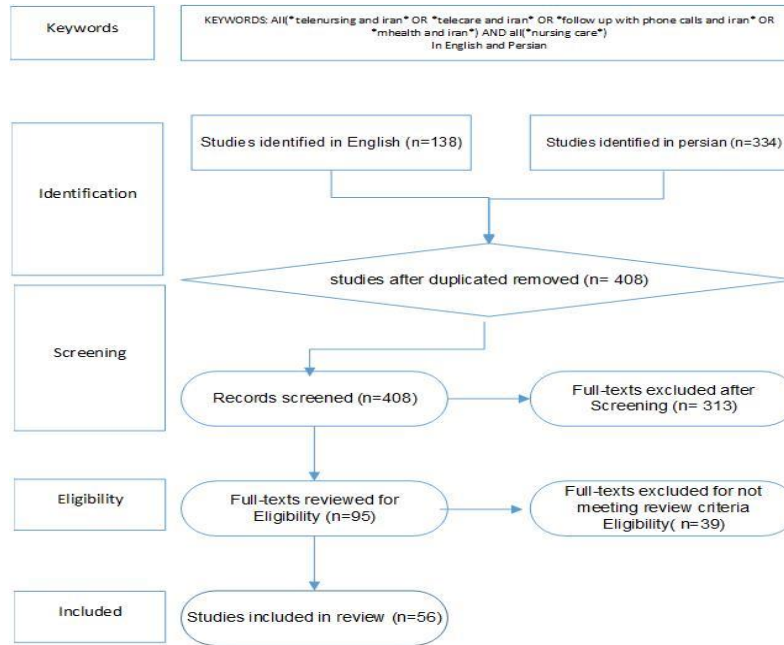
Figure 1. Flowchart of review

Table 2. Characteristics of the selected studies

study	Sample size	Study design	type of tele-nursing	goal	outcome
Rezaei (2020) (3)	90	clinical trial with a pretest posttest design	telephone	quality of life (QOL)	Intervention improved the quality of life of survivors of burn injuries
Bikmoradi (2016)(34)	71	quasi-experimental study	telephone	Adherence of treatment plan	Tele-nursing improve patients' adherence to treatment plan.
Dadgari (2017)(35)	70	RCT	telephone	quality of life	this type of follow-up counseling could improve the quality of life
Negarandeh (2019)(36)	80	RCT	Telephone	Self-Care Behaviors and Readmission	tele-monitoring improved self-care behaviors but did not reduce readmission rates

Nazar mozafari (2016)(37)	50	RCT	telephone	nutritional self-efficacy and physical activity	Intervention improved nutritional self-efficacy and physical activity
Namjoo Nasab (2017)(38)	64	experimental deign	Telephone	Self-management	Intervention improved glucose management, dietary control, and physical activity but not health care use
Sadeghi shermeh (2013)(39)	99	RCT	telephone and short message service	quality of life	no significant difference between follow-up care by telephone and short massage services
Ghodsbin (2018)(40)	60	RCT	telephone	ultrasound findings	Intervention improved liver size and liver histology
Sabzevari (2014)(41)	50	quasi-experimental	telephone	quality of life	Intervention improve the quality of life
Parizad (2013)(42)	66	experimental	telephone	self-care activities	Intervention promoted self-care activities
Yekefallah (2016)(43)	100	quasi-experimental	telephone	quality of life	Intervention improve the quality of life
Mousavifar (2011)(44)	77	quasi-experimental	telephone and short message service	Adherence to Treatment	Interventions improved adherence to Treatment and A1C hemoglobin level
Borhani (2013)(45)	60	RCT	Cellphone software	A1c hemoglobin	Intervention had positive effect on metabolic control of patients
Salimi Ezzt (2018)(46)	86	quasi-experimental	telephone	Treatment Adherence and Hemodialysis Adequacy	Intervention improved treatment adherence and dialysis adequacy
Hemmati Maslakpak (2012)(47)	66	Experimental with a pretest posttest design	telephone and short message service	Glycemic Control	Interventions improved Glycemic Control of patients
Fakharzadeh (2013)(48)	64	RCT	telephone	hemoglobin (HbA1c) and anthropometric indexes	tele-nursing, as a follow-up, could improve glycemic

Faraji *(2015)*(49)	70	non randomized controlled trial	telephone	illness perception and lifestyle	Intervention improved illness perception but lifestyle changes requires long-term interventions
Shojaee (2013)(50)	189	quasi-experimental	telephone	level of hope	Intervention increased hope
Shojaee (2014)(30)	189	RCT	telephone	anxiety	Intervention reduced anxiety
Zolfaghari (2017)(51)	32	quasi-experimental	telephone	Rehospitalization and Depression	Intervention reduced short-term depression and decreases the rehospitalization
Fallahpour (2018)(52)	60	quasi-experimental	telephone	Fatigue	Intervention reduced the amount and severity of fatigue
Imani (2015)(53)	35	before-after semi-empirical	telephone	anxiety level	Intervention reduced the level of anxiety
Najafi (2017)(29)	100	RCT	Telephone and telegram	blood pressure	Interventions were effective on the blood pressure
Forouzesh (2017)(54)	128	RCT	telephone	readmission due to complications	Intervention was effective on the number of visits due to postoperative complications
Bikmoradi (2020)(55)	70	RCT	telephone	Pain Reduction	Intervention reduced pain and improved patient health
Behzad (2016)(56)	88	quasi-experimental	telephone	Self - Efficacy in self-care behaviors	Intervention promoted the Self - Efficacy in self-care behaviors
Kamrani (2015)(57)	90	RCT	telephone	adherence to treatment	Intervention improved adherence to treatment
Ebrahimi (2017)(58)	60	RCT	telephone	medical adherence	Intervention increased medical adherence
Estaji (2016)(59)	30	before and after quasi-experimental	short message service	compliance	Intervention was effective on compliance of patients
Zamanzadeha (2017)(60)	66	single-blind RCT	telephone and short message service	empowerment	Interventions significantly improved the empowerment

Kargar Jahromi (2016)(31)	60	double blind RCT	telephone	Depression, Anxiety and Stress	Intervention improved emotional and health status of patients
Pedram Razi (2013)(61)	98	quasi-experimental controlled clinical trial	short message service	Asthma Self-Management	Intervention improved Asthma Self-Management
Najafi (2016)(62)	100	non-blinded randomized controlled clinical trial	telephone	Medication and Dietary Adherence	Intervention had positive effects on adherence to dietary and medication regimen in the patients with MI
Poorgholami (2016)(63)	75	single-blind RCT	telephone	Level of Hope	teaching followed by telephone follow-up was associated with higher levels of hope.
Malakouti (2016)(64)	182	Multicenter RCT	telephone	Clinical Outcomes	telephone follow-up services improved Most clinical variables
Bikmoradi (2017)(65)	71	quasi-experimental	telephone	quality of life	Intervention improved the quality of life
Samimi (2018)(66)	70	quasi-experimental	telephone	Self-care	Intervention improved total self-care and glycosylated hemoglobin
Boroumand *(2016)*(67)	70	RCT	telephone and short message service	cardiac self-efficacy	Interventions promoted the cardiac self-efficacy of patients
Khodaparast (2018)(15)	60	RCT	Telegram and multimedia CD	the Success of Lactation	Interventions had similar effects on the behavior of mother and baby in breastfeeding, effective nutrition of infant, frequency and the period of breastfeeding.
Jalal Marvi (2019)(28)	91	RCT	Education DVD and telephone	Severity of Insomnia	Telehealth reduced pregnant women insomnia

Zolfaghari (2012)(27)	77	quasi-experimental	short message services and telephone	diabetic adherence	Interventions improved HbA1c levels and adherence to diabetes therapeutic regimen for three months
Zarei (2013)(26)	60	RCT	telephone	Asthma Control	Educational Intervention and Modifying (telephone follow up) improved the asthma control
Niksalehi (2018)(68)	54	pre-test and post-test clinical study	short message services	Supporting Intervention	Intervention improved mothers' health literacy about maternal postpartum psychological disorders
Ahmadi babadi (2017)(69)	60	quasi-experimental	telephone	the feeling of loneliness	Telephone follow-up decreased the feeling of loneliness
Roozbahani (2015)(70)	80	RCT	telephone	blood glucose levels and postpartum screening	Intervention reduced fasting blood glucose levels and also increased the rate of postpartum screening test
Yekefallah (2016)(71)	100	quasi-experimental	telephone	quality of life	intervention increased the patients' quality of life and could provide better nursing care
Najafi Ghezeljeh (2018) (72)	100	RCT	telephone and telegram	Self-Management Behaviors	Interventions improved Self-Management Behaviors
Nesari (2010)(73)	61	Not mentioned	telephone	adherence to a diabetes therapeutic regimen	Intervention was effective in enhancing the level of adherence to a diabetes therapeutic regimen, such that the HbA1c level decreased

Mohammadi (2017)(8)	109	quasi-experimental	telephone	self-efficacy	self-efficacy was significantly increased after the intervention
Hemmati Maslakpak (2014)(74)	80	quasi-experimental	telephone	Self-Efficacy	Intervention increased the perception of self-efficacy
Aliabadi (2015)(75)	60	RCT	telephone	knowledge, attitude and skills of caregiving	Intervention increased awareness, understanding and skills of brain damaged caregivers
Parizad (2014)(76)	66	experimental study	telephone and short message services	Laboratory Parameters	Intervention had effect on controlling the laboratory parameters
Safari (2017)(33)	64	Double-blind RCT	telephone	the amount of glycosylated hemoglobin	Intervention had effects on patients' hemoglobin A1C and fasting blood sugar control
Madadkar Dehkordi (2020)(4)	60	RCT	telephone	Quality of Life	Intervention significantly increased the quality of Life
Poshtchaman (2014)(77)	90	RCT	telephone and short message services	treatment adherence	Interventions improved treatment adherence
Zolfaghari (2012)(13)	77	Semi experimental study	telephone and short message services	HbA1c	Interventions improved HbA1c

Table 3. Method of investigations

Intervention	Percent of intervention
Follow-up after an educational or empowerment program	66%
Follow-up with education or consultation	12.5%
Education, consultation or notification	21.5%

Table 4. Results of review

Method of tele-nursing	Percent of usage
Telephone	74%
SMS	17%
Software	2%
Telegram	4%
CD-DVD	3%

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