

A Systematic Review of Tele-Nursing Practices on Schizophrenia Patient Care



Esra USLU¹, Kadriye BULDUKOĞLU²

SUMMARY

Objective: To systematically evaluate the tele-nursing interventions and their efficiency in schizophrenia patient care.

Method: This study was conducted using scientific search engines such as Pubmed, Cinahl, Science Direct, Wiley Interscience, Ulakbim Medicine Database, and the Turkish Medline database. The English keywords were translated to “nursing by telephone” since that was the only term involved in the MeSH (Medical Subject Headings) index for English keywords and TST (Turkish Scientific Terms) for Turkish keywords. A total of six articles that met the inclusion criteria were involved in the evaluation.

Results: According to the findings that were evaluated within the scope of the systematic review, it was observed that the tele-nursing interventions were limited with Telephone Intervention Problem Solving (TIPS). The TIPS intervention was shown to extend the time spent by schizophrenia patients in society and decrease the duration of days spent at the hospital after rehospitalization as well as the number of applications for rehospitalization. The increased adherence to the psychiatric medication and social functioning was also observed to reduce the level of psychiatric symptoms after the discharge. Moreover, the face-to-face interviews being conducted before the TIPS intervention were shown to develop the verbal communication skills of patients.

Conclusion: According to this systematic review, the quantitative limitation of relevant studies is limited with the phone applications of tele-nursing interventions; however, it has positive results.

Keywords: Schizophrenia, telenursing, telephone

INTRODUCTION

Schizophrenia is a disease effecting about 24 million individuals across the world with an age range of between 15-35 years. Although its incidence is low, it is considered an extensive disease due to its chronic structure (WHO 2014), and contributes to the global burden of disease and cause disability (Murray et al., 2013). It usually arises during late-adolescence or in early adulthood. The majority of cases is treatable and function productively in life as well as integrate into society (WHO 2014).

Treatment of schizophrenia includes psychopharmacological and psycho-social approaches (Vaccaro et al., 1993). More than 50.0% of schizophrenia patients do not have access to the appropriate care, resulting in poor adherence (Perkins 2002, Beebe 2010, WHO 2014). Previous literature reported that patients have issues regarding their health and benefits of treatment, perceived cost (such as side effects of the medicine), and lack of social support during administration of treatment. All of these concerns have influence on the adherence of patients to treatment modalities (Perkins, 2002).

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¹Lecturer, Department of Psychiatric Mental Health Nursing, Selçuk University Akşehir Kadir Yallagöz School of Health, Akşehir, Konya, ²Prof., Department of Psychiatric Mental Health Nursing, Akdeniz University, Faculty of Nursing, Campus, Antalya, Turkey.

e-mail: esrauslu@akdeniz.edu.tr

Adherence problems experienced in the treatment process may cause recurrence of disease, increment in application to health institutions, increased hospitalization rate, increased cost, worsened general condition, decreased life quality, social isolation, increased substance abuse, unemployment, violence, increased victimization rates, arrests, and even death (Perkins, 2002; Ascher-Svanum et al., 2006; and Tseng et al., 2008). Accordingly, administration of the tele-health technologies in the care process of schizophrenia patients is an effective application that can establish a bridge between the healthcare provider and the patient. This modality can increase the adherence of schizophrenia patients to treatment and to ensure a positive response to the treatment (Kasckow et al., 2014).

Tele-health technology is a practice that has been an extensively used in treatment of chronic diseases (Kasckow et al., 2014). This practice increases access to health services, decreases costs, offers developed education opportunities, develops quality of care, enhances life quality, and provides social support opportunity (Jennett et al., 2003; Haley et al., 2011). This service is implemented through telephone, video-conference, internet (Hailey et al., 2008; Lillibridge & Hanna, 2009), radio (ICN, 2014) and home-type tele-health tools (Hailey et al., 2008).

Tele-psychiatry / tele-mental health practice is one effective way to enhance the ability of individuals in rural areas to have access to psychiatry services such as medication management and individual and group therapies rather than diagnosis and assessment (APA, 2014). This practice includes providing support to the patient by a caregiver through affordable and accessible call-system technology wherever and whenever it is necessary. Therefore, it would be possible to provide mental health service to the health clinics in rural areas, homeless shelters, schools, correction centers, and even cruise ships (Vesely, 2014).

Although application of tele-health technologies for individuals with serious mental disorders has increased, Walker and colleagues (2006) reported that schizophrenia patients have gained less attention in this regard (Kasckow et al., 2014). According to the studies conducted on this group, the patients indicated that they were satisfied with the tele-psychiatric practices (Modai et al., 2006); they were eager to continue having care with current practice (Jones et al., 2001); and that this practice reduced the feeling of stigmatization (Young, 2005). In a systematic reivew in which efficiencies of internet, social media, and telephone-based interventions in the group of patients with psychosis (Alvarez-Jimenez et al., 2014), it was concluded that this practice was acceptable, applicable, and enhanced clinical and social acquisitions.

Accelerated usage of technology in provision of health services has affected nurses as well. In cases in which long distance and sophisticated health problems are main concerns, nurses felt the need to apply tele-health technologies to ensure maintenance of continuous care for these patients (Nagel et al., 2013). The accessibility of schizophrenia patients to adequate care (Perkins, 2002; WHO, 2014) has been underrepresented in the literature (Beebe & Schwartz, 2014; Kasckow et al., 2014), but the impact of care in this process (Modai et al., 2006; Jones et al., 2001; Young, 2005; Alvarez-Jimenez et al., 2014) must be taken into consideration. Together with the previous literature, the present study aims to determine the tele-nursing initiatives used in caring of schizophrenia patients and their effects. Based on this, our research tried to answer the following question: “What are the tele-nursing initiatives used in caring of schizophrenia patients and their effects?”

METHOD

Research Strategy

This systematic review was conducted based on the “Centre for Reviews and Dissemination 2006” Guide developed by the National Health Research Institute of York University (Dixon-Woods et al., 2006). The present study was conducted through searches using Pubmed, Cinahl, Science Direct, Wiley Interscience, the Ulakbim Medical Data Base, and Turkish Medline databases. For keywords in English, the relevant keywords in the MeSH (Medical Subject Headings) directory and the ones which were not included in the directory were used. For Turkish keywords, the single word of “telefonla hemşirelik” included in the TBT (Turkish Scientific Terms) and Turkish translations of the English keywords were used. As determined, keywords were searched in several combinations, and the final search was conducted on August 2014 (Table 1).

Table 1. Keywords used in research

ENGLISH KEYWORDS	TURKISH KEYWORDS
	Telefonla hemşirelik
Tele-nursing AND schizophrenia	Tele hemşirelik VE şizofreni
Tele-health nursing AND schizophrenia	Tele sağlık hemşireliği VE şizofreni
Tele-psychiatry AND schizophrenia AND nurse	Tele psikiyatri VE şizofreni VE hemşire
Tele-mental health AND schizophrenia AND nurse	Tele ruh sağlığı VE şizofreni VE hemşire
Tele-psychiatry AND schizophrenia AND nursing	Tele psikiyatri VE şizofreni VE hemşirelik
Tele-mental health AND schizophrenia AND nursing	Tele ruh sağlığı VE şizofreni VE hemşirelik

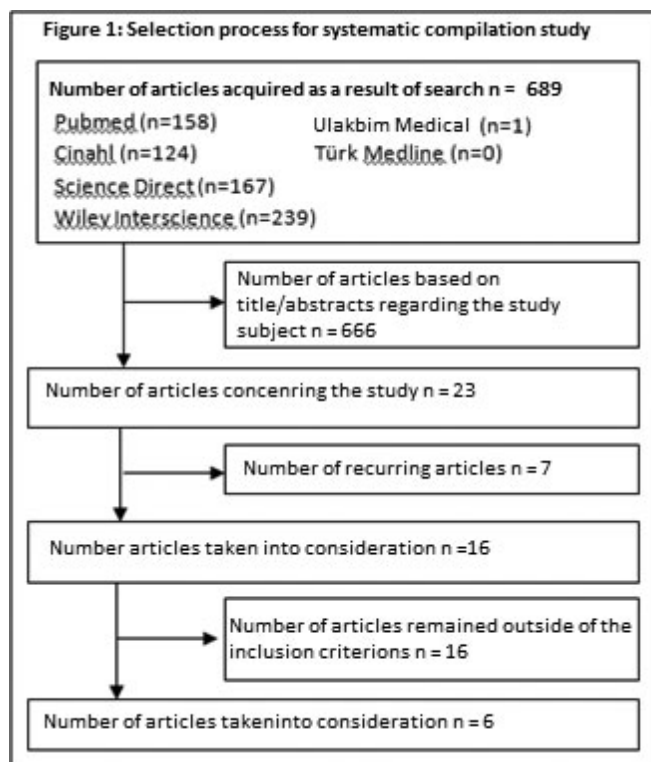
Criteria for inclusion

In order to reach a high level of proof, randomized controlled studies (RCS) (Harbour & Miller, 2001) and full-text articles in both Turkish and English languages were included. Other inclusion criteria were determined according to the PICO (Population, Intervention, Comparison, and Outcome). Thus, studies in which:

- Participants were only the ones diagnosed with schizophrenia,
- Interventions only applied as tele-nursing initiatives,
- “conventional methods” and “face-to-face” interview was applied before the intervention and were compared in initiatives,
- individuals’ socializing period, length of the re-hospitalization period, frequency of re-hospitalization, verbal communication skill, adherence to the medication, and concern and effect on symptom level were included in this systematic compilation.

Article Selection

Initially, searches were carried out using the databases and the relevant titles /abstracts were taken into consideration (n = 689). According to the research, the ones conforming to the aim of the present study were determined (n = 23). Recurring studies were identified and deleted (n = 16). After obtaining full texts of the potential studies, the ones conforming to inclusion criteria were selected (n = 6). The three articles had participants that were not diagnosed with schizophrenia, while two articles with a non-experimental research pattern and two articles with inaccessible full text were excluded from the scope of this study. The selection process is given in Figure 1.



RESULTS

The present study reviews six research articles. Five of these were in English and one of them was published in Turkish. All of the studies were RCS. Four of studies were conducted in the U.S., one in Spain, and another was conducted in Turkey. Interventions whose effectiveness was evaluated in studies were conducted by nurses. All of interventions cover “Telephone Intervention Problem Solving” (TIPS). The findings acquired by means of these studies were presented under titles of “sampling, intervention and procedure, tools for measurement, and effect of the tele-nursing practices” (Table 2).

Sampling

The first article reviewed was studied by Beebe (2001). Beebe (2001) investigated records of psychiatry patients and 48 patients gave consent to participate in this research. These patients were randomly separated into two groups of experiment (n = 24) and control (n = 24). Analysis was completed with a total of 37 patients (15 from the experiment group and 22 from control group). The next study was reported by Beebe & Tian (2004). Since study includes 59 participants, it satisfied the inclusion criteria. Twenty four patients participated in the study and were randomly grouped into groups with an equal number of patients, namely the experiment (n = 12) and control groups (n = 12). The analysis was completed with 20 patients (10 from the experiment and 10 from the control group). Again another study reviewed in the present study was from Beebe et al. (2008), which covered 63 patients. Twenty nine patients participated in the study and were grouped randomly in experiment (n = 15) and control groups (n = 14). Analysis was conducted on 13 patients from the experiment and 12 patients from the control group. Another study reviewed in the present study was reported by Montes et al. (2010) and totaled 928 patients. These patients were again randomly separated in two groups, experiment (n = 456) and control (n = 472). The analysis was conducted on 847 patients. Of these patients, 409 consisted of the experiment group and 438 made up the control group. In study by Beebe, Smith and Phillips (2014), 30 of 37 patients diagnosed with schizophrenia or schizoaffective disorder participated in the study because seven of them did not consent. Consented patients were separated into three groups of 10 patients. The final study by Özkan et al. (2013), which consisted of 62 schizophrenia patients was reviewed. Thirty two of these patients made up the experiment group, while 30 were in the control group.

Intervention and Procedure

Beebe (2001)’s study aimed to evaluate the effectiveness of the telephone interventions on enhancing outcomes of the caring process for schizophrenia patients. The experiment group

Table 2. Characteristics of the researches taken into consideration

ARTICLE	PURPOSE	SAMPLING	INTERVENTION AND PROCEDURE	TOOLS FOR MEASUREMENT	EFFECT OF TELE-NURSING PROGRAM
Beebe, 2001, USA	Evaluating effectiveness of telephone intervention	n = 48 Experiment group: 24 Control group = 24	Experiment group: Telephone intervention applied. Control group: Social-based monitoring service given.	-Spending time in public -Length of the re-hospitalization period -Frequency of re-hospitalization	Extended stay of the experiment group in public; hospitalization period and re-hospitalization frequency decreased.
Beebe and Tian, 2004, USA	Investigating effects of face-to-face interview in pre-TIPS period on patients' verbal responses	n = 24 Experiment group = 12 Control group = 12	Experiment group: Face-to-face interview and TIPS applied. Control group: only TIPS applied	-Interview period -Number of sentimental expressions during interview - Number single-word answers during interview - Medication inventory	Participants from experiment group have longer interview period; used twice sentimental expression; gave less single-word responses.
Beebe et al, 2008, USA	Evaluating effect of TIPS on patients' adherence to medication.	n = 29 Experiment group = 15 Control group = 14	Experiment group: TIPS application. Control group: Conventional method application.	- Medication inventory	Experiment group has higher adherence level to medication treatment.
Montes et al, 2010, Spain	Investigating effect of telephone-based intervention in adherence to antipsychotic treatment.	n = 928 Experiment group = 456 Control group = 472	Experiment group: Telephone-based nursing initiative Control group: Conventional method intervention	-Medication attitude inventory -Treatment adherence record - Clinical global monitoring scale in schizophrenia -Life quality scale	It was determined that experiment group exhibits higher adherence to treatment.
Beebe et al, 2014, USA	Determining effects of separate application of TIPS, short messaging, and joint application of both methods on adherence to medication	n = 30 1st Group = 10 2nd Group = 10 3rd Group = 10	1st group Intervention of daily short message. 2nd group Intervention of TIPS. 3rd group Intervention of daily short message and TIPS jointly.	- Medication inventory -Brief psychiatric evaluation scale	While psychiatric medication adherence score of the 3rd group was found higher and symptom level was lower.
Özkan et al, 2013, Turkey	Effect of mental training and tele-psychiatric monitoring on social functionality and on adherence to medication	n = 62 Experiment group = 32 Control group = 30	Experiment group: Mental training during hospitalization and telephone-monitoring on patients in post-hospitalization. Control group: Intervention through conventional method.	-Social functionality scale -Scale for adherence to medical treatment rate	It was found that average treatment adherence and social functionality scores of patients in experiment group increased.

incurred in an intervention, including weekly telephone interviews during a post-hospital discharge period of three months, in addition to the routine society-based monitoring service. The control group provided routine social-based monitoring service for 3 months after being released from the hospital. For each participant in the experiment group, a weekly schedule including the specific day and time for telephone interviews was organized with patients after their discharge. The researcher maintained a 10-minute telephone intervention with patient every week. Coverage of the telephone interventions was determined by a protocol. Patients from the control group were contacted over the phone on the 6th and 12th week after their release from the hospital. During this conversation, it was asked whether they were re-hospitalized. If the relevant patient was re-hospitalized, his/her hospital administration records were investigated and data regarding their hospitalization period were collected. The interview took about one to three minutes.

The second article evaluated was published by Beebe & Tian (2004). The purpose of that study was to evaluate the effect of face-to-face interviews with patients before TIPS on their verbal responses after diagnosis of schizophrenia. Experiment and control groups were intervened with weekly TIPS for a six-week period. But, unlike the control group, individuals in the experiment group were interviewed on a face-to-face basis. Each participant from the experiment group was face-to-face interviewed twice in the presence of a psychiatry nurse after their release from the hospital in order to clarify participants' expectations and prejudice. The first interview was held just before their release. The interview took 12 minutes on average and the roles of researchers and participants were explained. The second interview was held before the TIPS and took seven minutes on average with an aim to enhance patient-nurse relationship. On the other hand, there was no interview held in the pre-TIPS period in the control group. For each participant, a weekly-based telephone interview schedule, including date and time was prepared and all calls

were initiated by the TIPS providers. After the face-to-face interview, weekly telephone calls were maintained within the scope of the TIPS protocol for a six-week period.

The third study taken into evaluation within the outline of the present study was conducted by Beebe et al. in 2008 to evaluate the effect of the TIPS on medication adherence of schizophrenia patients. In this regard, the experiment group was intervened with weekly TIPS and routine treatment for three months, while the control group was only intervened with routine treatment. Content of the routine treatment consisted of practices such as medication treatment, physician visits, monitoring, case management, psycho-social rehabilitation, and employment. The TIPS process was applied to the participants in the experiment group by nurses who completed training given by the principal author of the study on times determined by nurses. Data regarding the TIPS were recorded in written form during the telephone interviews. After all these, participants' residential places were paid visit once a month for a three-month period for monitoring medication inventory in order to evaluate medication adherence. Appointments for medication monitoring at home were confirmed over the phone. In the meantime, questions for patients concerning medication administration were answered. Two researchers visited the patients' house for inventory of medication and the blind researcher counted the pills and told the result to the other researchers verbally.

A fourth study conducted by Montes et al. (2010) investigated the effect of a telephone-based intervention by a nurse on adherence of schizophrenia patients to anti-psychotic treatment. In this scope, the control group was intervened by a conventional method while the experiment group incurred intervention based on telephone-nursing. Each patient from the experiment group was given the standard telephone interview on the 4th, 8th, and 12th weeks with the assistance of a nurse. Moreover, patients were evaluated by a physician both in the beginning and at the end of the fourth month. On the other hand, the control group continued with conventional care adopted by the public mental health center without administering telephone interviews, and the patients were taken into evaluation by physician at the end of the fourth month. Telephone-based nursing intervention was carried out by nurse with public mental health experience. Before the interview with patients, the nurses took a 40-minute training session. During the interviews, a brief, semi-structured evaluation survey form was utilized during the assessment of patients' treatment adherence. If nurse recognized failure of patient in the adherence to the treatment, it was suggested to visit to the relevant psychiatrist.

The fifth study evaluated was reported by Beebe, Smith & Phillips (2014), which targeted the effect of usage of solely short messages, or the TIPS, or jointly short messages and the TIPS on symptom level and medication adherence of

schizophrenia patients. To that end, patients were randomly separated in three groups. The first group was solely intervened through a short message, while the second group was intervened through TIPS. The third group was intervened through both a short message and the TIPS method. All participants were provided a cell phone with unlimited call and messaging packages. Moreover, their residential places were paid a visit after receiving an appointment for medication inventory every month. The TIPS method was applied for a three-month period on weekly basis according to the TIPS protocol. Patients were called by a trained nurse and their responses were kept recorded. The interview was administered along with the following questions:

Are you taking your medication as prescribed? Have you missed any doses at all?

Do you know when your next appointment is scheduled?

Have you had any (symptom) since we last talked? (Symptoms specific to each participant were collected at baseline.)

Have you had any cravings for alcohol or other drugs this week that you've found uncomfortable?

How have you been getting along with others this week?

Do you have any questions about anything this week?

Is there anything else you'd like to talk about today?

Messaging interventions; they were conducted for three months on daily basis. For this study, Beebe, Smith & Phillips (2014) indicated that they used the multiple-choice messaging format adopted by Granholm et al. (2012). The content was formed by adapting this format to TIPS. Headlines of this format were given as below:

Hello from the texting study. Today's topic is medications. Did you take your medications today? You can say: Yes; Some; I don't want to; or I forgot.

Hello from the texting study. Today's topic is appointments. Do you know when your next appointment is scheduled? You can say Yes; No; or I'm not sure.

Hello from the texting study. Today's topic is symptoms. Have you been bothered by any [specific symptom here]? You can say Not at all; A little; or A lot.

Hello from the texting study. Today's topic is cravings. Have you had any cravings for alcohol or other drugs that you've found uncomfortable? You can say Not at all; A little; or A lot.

Hello from the texting study. Today's topic is social. How have you been getting along with others? You can say Very well; Pretty well; or Not so well.

Hello from the texting study. Today's topic is anything you have questions about.

Thank you for being a part of the texting study. We appreciate you! Have a great day!

Finally, the sixth study reported by Özkan et al. (2013) used mental training for patients in the experiment group during the hospitalization period. The training was applied in seven or eight sessions, which takes an average of 25-30 minutes each. This training was not given to the control group. After release from the hospital, a weekly 15-minute-long telephone monitoring was applied to the experiment group on a standard date and time for a six month period. The content of the telephone monitoring activities consisted of repeating mental training, consultancy, and support given to the patients when they experienced difficulties. Meanwhile, the process was conducted by the researcher through prepared survey forms and interviews. Patients from the experiment and the control groups were measured with designated tools at the end of their hospitalization, discharge from the hospital, and during the six-month long telephone monitoring process.

Tools for measurement

Efficiency of programs applied in evaluated studies was assessed through various methods and measurement tools. Beebe (2001) assessed efficiency of his study based on three measures: time spent in public, length of re-hospitalization period, and frequency of re-hospitalization. In addition, he used the BPRS only in the beginning of the study. In the studies conducted under management of Beebe in 2008 and 2014, medication inventory was maintained to assess efficiency and a formula was constructed to calculate a medication adherence percentage. Beebe, in his study conducted in 2014, used "Brief Psychiatric Rating Scale – BPRS" scores in both the pre- and post-study period. In the study conducted by Beebe & Tian (2004), efficiency was assessed by length of each telephone interview, number of sentimental expressions used in every call, and the number of single-word answers in every call. Montes et al. (2010) used four measures in their study. The first one was "Drug Attitude Inventory" (DAI-10), which was developed to measure subjective responses toward anti-psychotic treatment and an attitude of the chronic schizophrenia patients. The second was "Register of Adherence to Treatment" (RAT) with four degrees. Each included different scales that were formed by the researchers to cover anti-psychotic medication. The third measure was "Clinical Global Impression- Schizophrenia" (CGI-SCH) which measured severity of disease and fluctuation degree. The fourth and final measure was "Life Quality Scale" (EuroQol- EQ-5D), which evaluated the quality differences of daily lives of schizophrenia patients with various level of disease in regard to the disease. Özkan et al. (2013) used two measures in their research. The first one of these was "The Social Functioning Scale" (SFS) that was used to evaluate social functionality of schizophrenia patients and variations that arose over time. The other one was "The Medication Adherence Rating Scale"

(MARS), which was used to measure the treatment adherence of psychiatric patients.

Effect of the tele-nursing program

In the present systematic compilation, the effect of the tele-nursing practices was evaluated under seven headlines: (1) duration of stay of individuals in public environment; 2) length of re-hospitalization; 3) frequency of re-hospitalization; 4) verbal communication skill; 5) adherence to medication treatments; 6) symptom level; and 7) level of social functionality. All of these constitute the evaluation measures for efficiency of tele-nursing initiatives.

Duration of stay in public: covers the time period that participants spend in a public environment, which was only recognized as a measure by Beebe (2001). According to the study results, the average duration of stay in public exhibited by the group (the control group) receiving social-based monitoring service was 78.25 days, while this period was 81.36 days by the experiment group that received telephone interventions. Conclusively, duration of stay for the experiment group in public was extended 4.0% compared to the control group. Furthermore, duration of stay of the experiment group in public remained stable for the first 30 days, while this measure decreased for the control group continuously to the end of the study.

Length of re-hospitalization: describes the length of stay at the hospital when participants were re-administered into the hospital. This measure was only considered by Beebe (2001). While the average re-hospitalization length of the group receiving telephone interventions (the experiment group) was found to be 18.95 days, this figure was measured to be 26.13 days for the control group. As a result, the experiment group's re-hospitalization period reduced by 27.0% on average in comparison with the control group. However, this difference was not statistically significant ($t(4) = -0.724$, $p = 0.51$).

Frequency of re-hospitalization: is a measure considering the frequency of participants' re-hospitalization rate. This measure is the last evaluation used in the study by Beebe (2001). During the study, 13.0% of the experiment group received telephone interventions, and 23.0% of the control group were re-hospitalized. Although the re-hospitalization rate between the experiment and the control group was not statistically significant ($t(35) = -0.649$, $p = 0.52$), the findings suggested that the re-hospitalization rate of the experiment group was reduced by 10.0%.

Verbal communication skill: was used as a measure to evaluate efficiency in the study of Beebe & Tian (2004). This measure was evaluated by the length of each telephone interview, number of sentimental expressions used in each call, and the number of single-word answers given in each call. Before the TIPS intervention, telephone interview lengths of the two

groups (one of which applied face-to-face interview, while the other one is only applied the TIPS) were compared. It was found that this period was longer in the experiment group. Furthermore, the difference between interview lengths at the first and third week was found to be statistically significant ($F(1.7) = 8.49$, $p = 0.02$). When “number of sentimental expressions used during the calls” was compared between groups, the experiment group was twice the value measured for the control group (Odds ratio = 1.85, $p = 0.07$). Finally, when the number of single-word answers given during each call was compared, the number of single-word answers of the participants in the experiment group was half of the value measured with the control group although there was no statistically significant difference (odds ratio = 0.5355, $p = 0.64$).

Adherence to medication treatments: is described as a measure for evaluating the efficiency in three studies taken into consideration of the present study. The first one of these studies was conducted by Beebe et al. (2008). When efficiencies of the TIPS (experiment group) and routine treatment method (control group) were compared, adherence level of the participants to the psychiatric and non-psychiatric medication treatments was evaluated. The adherence level of the experiment group to psychiatric medication treatments was 80.0%, while the control group measured 60.1%. A statistically significant difference was found between these two groups in terms of adherence to the psychiatric medication ($F(1.20) = 5.47$, $p = 0.0298$). When levels of adherence to the non-psychiatric medication were compared, the experiment group rate was 33.0% and the control group was 22.0%. However, it was found that there was no statistically significant difference between these values ($F(1.11) = 1.38$, $p = 0.265$). Moreover, treatment adherence was investigated in context of the group-time interaction for both psychiatric and non-psychiatric medications and was found to not be statistically different for both psychiatric medication ($F(2.20) = 2.33$, $p = 0.1234$) and non-psychiatric medication ($F(2.11) = 2.65$, $p = 0.115$).

Another study in which adherence to medication treatment was evaluated was done by Montes et al. (2010). In this scope, the TIPS (experiment group) application and the conventional method (control group) were compared. Concerning the pre-intervention period, adherence of the experiment group was found as 88.2%, while the adherence of the control group was found as 90.0% without statistical significance when adherence to medical treatment was compared between the two groups. According to the measurements done at the end of the study, adherence of the experiment group to the medication treatment increased by 8.5% (96.7%) and the control group increased by 1.1% (91.2%) ($p = 0.0007$). Therefore, adherence of the experiment group to the medication treatment was significantly higher compared to the control group (Corrected OR = 3.3 95% CI 1.6-6.6, $P = 0.0001$). Furthermore, adherence of the

experiment group to the medication treatment increased after monthly TIPS applications (1st month: 92.2%, 2nd month: 94.3%, 3rd month: 95.7%, 4th month: 96.7%). Forty four patients (10.4%) from the experiment group were not able to adapt the treatment ($p = 0.0013$) and 23 patients (5.2%) from the control group ($p = 0.43$) were ensured to adapt to the treatment. It was observed that patients from the experiment group (25.7%) exhibited higher adherence to the treatment compared to the control group (16.8%) ($p = 0.0013$) when elevated adherence level was considered. Logistic regression analysis was conducted according to the age, gender, marital status, severity of the disease, misuse of drugs, antipsychotic treatment classification, and (typical/atypical) average DAI-10VE EQ-5D score. There was no statistical difference found between the findings from the experiment and the control groups in regard to these characteristics ($p > 0.05$).

Adherence to the medication treatment was also considered by Beebe, Smith & Phillips (2014) in their study. In the present study, adherence to the medication treatment was evaluated among three different groups. These groups were separately intervened through a short message, TIPS, and a combination of both methods. When adherence to psychiatric ($F(4.26) = 1.24$, $p = 0.31$) and non-psychiatric ($F(4.26) = 0.53$, $p = 0.71$) medication treatments was evaluated by calculating doses taken, it was revealed that there was no statistically significant difference found. However, the score of the group intervened through the psychiatric medication treatment was found for the group intervened jointly with the TIPS and short messaging. According to the measurement results of three intervention groups, it was found that 5.3% were higher compared to the TIPS group, and 13.0% higher compared to the short messaging group. When comparing adherence to the non-psychiatric medication treatment score, the group intervened through the TIPS and short messaging showed two of the three measurements in which short messaging intervention was applied were found 11.9% higher. All three measurements in which the TIPS intervention was applied were found to be 14.9% higher.

In the final study, adherence to the medication treatment was evaluated and reported by Özkan et al. (2013). In the present study, the experiment group was given mental training and monitored over telephone. MARS general scores of the patients from the experiment and control groups were evaluated before and after psycho-training and after telephone monitoring. While average general MARS scores were lower in the before-training control group, it was observed that it increased after the training. Scores measured after telephone-monitoring persisted without changing and it was reported that the difference between general average MARS scores of the experiment group and the control group was significant ($p < 0.001$).

Symptom level was used by Beebe, Smith & Phillips (2014) in their study. To that end, BPRS scores of participants were taken into consideration. The score for the group intervened in jointly by the TIPS and daily messaging was found 9.2 lower in two of the three measurements in comparison with the score measured for the group intervened only by daily messaging. Concerning the group intervened in by the TIPS treatment, the score was found to be 5.7 lower in all three measurements ($F(4,26) = 4.2, p = 0.005$).

Level of social functionality: was used by Özkan et al. (2013) in their study. According to the general average score of participants measured for level of social functionality, there was a statistically significant difference found between the experiment and the control groups ($p < 0.001$). While the average social functionality scores of the patients from the experiment group were slightly lower than the control group before the training, a significantly higher score was measured after training and after telephone monitoring intervention. It was determined that the general average social functionality score of patients from the control group exhibited decreasing patterns along the three measurements. A statistically significant difference was found among the measurements ($p < 0.001$).

DISCUSSION

Results of the present study investigated tele-nursing initiatives for schizophrenia patients and their effects. This study revealed that an intervention positively affects individuals diagnosed with schizophrenia. Furthermore, it provided guidance on how to apply technology and telecommunication tools to psychiatric nursing practices.

Tele-nursing practices allow application of telecommunication technologies to strengthen patient care (International Council of Nurses - ICN, 2014). In cases of long distances and sophisticated health problems, nurses integrate tele-health practices into the caring process (Nagel et al., 2013). Thus, access to care can be enhanced and may provide support to the individuals with several health disorders. In addition, cost of providing health service would be decreased and self-efficiency of individuals with chronic diseases would increase (Polisena et al., 2009).

ICN (2014) indicated that tele-nursing was not a new concept, and nurses have been providing health information and suggestions in some locations over the years. This practice has been flourished in western countries. Additionally, this practice has been helpful in enhancing general health, preventing diseases, and enhancing nurse diagnose, care, and training progressively. In spite of all this information on hand, only one study concerning the tele-nursing initiative and interventions toward the schizophrenia patients in Turkey. This is a remarkable finding of this systematic compilation study.

Erdemir & Akman (2009) suggested that the reason for limited application of tele-nursing practices in Turkey was due to the, “uncertainties regarding occupational education and health policies; limitations in training and practice in terms of technology usage; insufficiency of institutions and society in terms of technologic competency; and obstacles before nurses regarding their occupational autonomy”.

Although technology usage in provision of health services has increased rapidly (Nagel et al., 2013), it was reported that tele-nursing initiatives have difficulties compared to the face-to-face or physical care due to the non-interaction with patients. It caused concerns about whether this type of nursing was “real nursing” or not, and access to the service and provision of service was in question (Snooks et al., 2008). Nevertheless, essence of the tele-nursing interventions was constituted by effective verbal communication. It was expected that nurses providing telephone-care services to listen patients actively, to act in acquiescently, to clarify, and support the information that was gathered, and to deal with resolving problems of patients (Wilson & Hubert, 2002). This expectation coincides with the opinions of Peplau, one of the psychiatric nursing theorists who defines nursing as an inter-personal process and emphasizes the importance of communication as basic element of care and change (Fawcett, 2005). In order to manage this negative perception, Snooks et al. (2008) suggested that including technology usage, new nursing skills need to be developed, productivity should be increased; and tele-nursing initiatives must be recognized as much as apparent nursing (hands-on nursing) practices.

In spite of proven benefits of the tele-health practices, only six researchers, in which tele-nursing initiative was applied on schizophrenia patients, were found qualified to be included in this systematic compilation. Four of these researches were in leadership of Beebe, and only two were conducted by other researchers. The limited number of researchers demonstrates the lack of data regarding usage of tele-health technologies for schizophrenia patients by nurses. Moreover, it was observed that, although tele-health practices can be applied by means of telephone, video-conference, internet (Hailey et al., 2008; Lillibridge & Hanna, 2009), radio (ICN, 2014) and home-type tele-health tools (Hailey et al., 2008), the researchers investigated were only investigated applications over telephone.

Telephone intervention is a tele-nursing initiative with certain protocol, which was developed by Beebe in 2005, and described as “Telephone Intervention Problem Solving” (Beebe et al., 2008). According to the articles reviewed, the scope of the researchers (in which intervention was not referred as the TIPS) and the scope of the intervention exhibited a similarity to TIPS. The TIPS is conducted through messaging and/or search method. Moreover, it was reported that TIPS intervention supports schizophrenia patients and assists them to develop their problem-solving skills against the issues that they

face in the daily life. Additionally, TIPS was demonstrated to support the element for schizophrenia-diagnosed individuals in society in terms of medication literacy and strategies for adherence to medication (Beebe et al., 2008). According to the study, findings obtained as a result of the present systematic compilation scope revealed that telephone/ TIPS intervention extends the schizophrenia patients' time spent in public after their release from hospital until their first re-hospitalization (Beebe, 2001). Moreover, interventions decreased schizophrenia patients' period spent at the hospital following each psychiatric re-hospitalization as well as their number of application to psychiatric units for re-hospitalization (Beebe, 2001). At the same time, interventions were observed to increased the adherence to the psychiatric medication treatment in the post hospital-release period (Beebe et al., 2008; Montes et al., 2010; Beebe et al., 2014) and reduce levels of the psychiatric symptoms (Beebe et al., 2014) and increase social functionality (Özkan et al., 2013). Further, it was determined that face-to-face interviews enhanced verbal communication skills of patients in the pre-TIPS period (Beebe & Tian, 2004). Results of the articles reviewed within the scope of the present study supported benefits of the TIPS method and the affect of the tele-nursing initiative on released schizophrenia patients.

Of the psychiatric nursing theorists, Orlando, claimed that nursing process commences with patient behavior and this behavior can either be verbal or non-verbal (Fawcett, 2005). Study results reported by Beebe and Tian (2004) confirm this opinion, which emphasizes that nurses are required to make face-to-face interviews with patients at least twice before the TIPS intervention. The study also revealed that face-to-face interviews in the pre-TIPS period increased verbal communication skills of patients.

Limitations

Concerning the limitation of this systematic compilation, studies languages other than English and Turkish were left outside of the scope. In addition, the study was conducted based on the search carried on six databases and the grey literature was not included. Lastly, a limited number of studies were included (six articles), and the results were required to be interpreted and generalized carefully.

Conclusion

The results of the present systematic compilation indicated quantitative inadequacy of reviewed studies. Tele-nursing practices applied for schizophrenia patients in all studies included and remained limited within telephone practices. However, their results supported positive development of schizophrenia-diagnosed individuals. In this scope, it was suggested to increase number of RCS, in which efficiency of the tele-nursing practices were evaluated. In addition, it is

important to plan similar studies with other patient groups using different methods other than telephone practices.

REFERENCES

- Alvarez-Jimenez MA, Alcazar-Corcoles MA, González-Blanchd C et al (2014) Online, social media and mobile technologies for psychosis treatment: A systematic review on novel user-led interventions. *Schizophr Res* 156:96–106.
- American Psychiatric Association. Accessed: 12 August 2014 <http://www.psychiatry.org/practice/professional-interests/underserved-communities/telepsychiatry>
- Ascher-Svanum H, Faries DE, Zhu B et al (2006) Medication adherence and long-term functional outcomes in the treatment of schizophrenia in usual care. *J Clin Psychiatry* 67:453–60.
- Beebe LH (2001) Community Nursing support for clients with schizophrenia. *Arch Psychiatr Nurs* 15:214–22.
- Beebe LH (2010). What community living problems do persons with schizophrenia report during periods of stability? *Perspect Psychiatr Care* 46:48–55
- Beebe LH, Tian L (2004) TIPS: Telephone intervention—problem solving for persons with schizophrenia. *Issues Ment Health Nurs* 25:317–29.
- Beebe LH, Smith K, Crye C et al (2008) Telenursing intervention increases psychiatric medication adherence in schizophrenia outpatients. *J Am Psychiatr Nurses Assoc* 14:217–24.
- Beebe LH, Smith KD, Phillips C (2014) A comparison of telephone and texting interventions for persons with schizophrenia spectrum disorders. *Issues Ment Health Nurs* 35:323–9.
- Beebe LH, Schwartz (2014) Telephone-based disease management for severe enduring mental illnesses. *Home Health Care Manag Pract* 26:49–54
- Dixon-Woods M, Bonas A, Booth A et al (2006). How can systematic reviews incorporate qualitative research? A critical perspective. *Qual Res* 6:27–44.
- Erdemir F, Akman A (2009). Tele-Hemşirelik. *TURKMIA'09 Proceedings*, VI. Ulusal Tıp Bilişimi Kongresi Bildirileri. Accessed: 2 Ekim 2014 <http://www.turkmia.org/stc2009/cd/pdf-format/Erdemir.pdf>
- Fawcett J (2005). *Contemporary Nursing Knowledge Analysis and Evaluation of nursing Models and Theories*. 2. Edition. Philadelphia, FA. Davis.
- Harbour R, Miller J (2001) A new system for grading recommendations in evidence based guidelines. *BMJ* 323:334–6.
- Hailey D, Roine R, Ohinmaa A (2008) The effectiveness of telemental health applications: a review. *Can J Psychiatry* 53:769–78.
- Haley C, O'Callaghan E, Hill S et al (2011) Telepsychiatry and carer education for schizophrenia. *Eur Psychiatry* 26:302–4
- International Council of Nurses – ICN (2014). Telenursing. Accessed: 2 October 2014 http://www.icn.ch/images/stories/documents/publications/fact_sheets/18b_FS-Telenursing.pdf
- Jennett PA, Affleck Hall L, Hailey D et al (2003) The socio-economic impact of telehealth: a systematic review. *J Telemed Teleca* 9:311–20.
- Jones RB, Atkinson JM, Coia DA et al (2001) Randomised trial of personalized computer based information for patients with schizophrenia. *BMJ* 322:835–40.
- Kasckow J, Felmet K, Appelt C et al (2014) Telepsychiatry in the Assessment and Treatment of Schizophrenia. *Clin Schizophr Relat Psychoses* 8:21–7A
- Lillibridge J, Hanna B (2009) Using telehealth to deliver nursing case management services to HIV/AIDS clients. *The Online Journal of Issues in Nursing*. Accessed: 2 October 2014 <http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TableofContents/Vol142009/No1Jan09/ArticlePreviousTopic/TelehealthandHIVAIDSclients.html#ANA>
- Modai I, Jabarin M, Kurs R et al (2006) Cost effectiveness, safety and satisfaction with video telepsychiatry versus face-to-face care in ambulatory settings. *Telemed J E Health* 12:515–20.
- Montes JM, Maurino J, Diez T et al (2010) Telephone-based nursing strategy

- to improve adherence to antipsychotic treatment in schizophrenia: A controlled trial. *Int J Psychiatry Clin Pract* 14:274-81.
- Murray CJL, Vos T, Lazono R et al (2013) Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: A systematic analysis for the global burden of disease study 2010. *Lancet* 380:2197-223.
- Nagel DA, Pomerleau SG, Penner JL (2013) Knowing, caring, and telehealth technology: "going the distance" in nursing practice. *J Holist Nurs* 31:104-12.
- Özkan B, Erdem E, Özsoy SE ve ark (2013) Şizofreni hastalarına verilen ruhsal eğitim ve telepsikiyatrik izlemenin hasta işlevselliği ve ilaç uyumuna etkisi. *Anadolu Psikiyatri Derg* 14:192-9
- Perkins DO (2002) Predictors of Noncompliance in patients With Schizophrenia [CME]. *J Clin Psychiatry* 63:1121-8.
- Polisena J, Tran K, Cimon K et al (2009). Home telehealth for diabetes management: A systematic review and meta-analysis. *Diabetes Obes Metab* 11:913-30.
- Snooks HA, Williams AM, Griffiths LJ et al (2008) Real nursing? The development of telenursing. *J Adv Nurs* 61:631-40.
- Tseng KC, Hemenway D, Kawachi I (2008) Travel distance and the use of inpatient care among patients with schizophrenia. *Adm Policy Ment Health* 35:346-56.
- Vaccaro JV, Young AS, Glynn S (1993) Community-based care of individuals with schizophrenia. Combining psychosocial and pharmacologic therapies. *Psychiatr Clin North Am* 16:387-99.
- Vesely R (2014) Telepsychiatry poised to take off, but obstacles remain. *IHealthBeat, Reporting Technology's Impact on Health Care*. Accessed: 20 August 2014
<http://www.ihealthbeat.org/insight/2013/telepsychiatry-poised-to-take-off-but-obstacles-remain>
- Walker H (2006). Computer-based education for patients with psychosis. *Nurs Stand* 20:49-56.
- Wilson R, Hubert J (2002) Resurfacing the care in nursing by telephone: Lessons from ambulatory oncology. *Nurs Outlook* 50:160-4
- World Health Organization. Mental Health-Schizophrenia. Accessed: 13 August 2014
http://www.who.int/mental_health/management/schizophrenia/en/
<http://www.who.int/topics/schizophrenia/en/>
- Young KS (2005) An empirical examination of client attitudes towards online counseling. *Cyberpsychol Behav* 8:172-7.