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EFFECTS OF TELE-NURSING INTERVENTION AMONG PATIENTS WITH SCHIZOPHRENIA: AN EVIDENCE BASED

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Abstract
Background: Nonadherence with medication occurs in all chronic disorders. It is a challenge in schizophrenia due to the nature of illness's association with social isolation, stigma, and substance misuse, lack of insight and cognitive impairment. It increases the risk of relapse, rehospitalization, self-harm, increases inpatient costs, and lowers quality of life. Tele-nursing interventions improve medication adherence, shared decision-making, ensuring that treatment is effective and that side effects are managed, promoting a positive therapeutic alliance and good communication between the physician, nurse and patient. Objective: To systematically evaluate the tele-nursing interventions and their efficiency in schizophrenia patient care. Method: This study was conducted using scientific search engines Cumulative Index of Nursing Allied and Health Literature (CINAHL), OVID, Pubmed, Wiley, Science Direct and PsycINFO database were searched for relevant information from 2010 until 2016. Results: According to the findings that were evaluated within the scope of the systematic review, it was observed that the tele-nursing interventions were telephone calls and text messages used, shown to extend the time spent by schizophrenia patients in society and decrease the duration of days spent at the hospital after rehospitalization. Conclusion: According to this systematic review, the applications of tele-nursing interventions are effective among schizophrenia patients.
Keywords: schizophrenia; tele-nursing; adherence; nonadherence

Introduction

Evidence-based practice is the systematic use of best evidence to make clinical decisions for patient care, use of best evidence for clinical decision making to improve patient outcomes, provide professional development opportunities, contribute to recruitment and retention of staff, and saves health care dollars. So, it aims to establish scientific approaches for the treatment of schizophrenia and set goals to use these approaches to decrease the prevalence of crisis states such as suicide, homelessness, relapse and rehospitaliztion (Zauszniewski, Suresky, Bekhet & Kidd, 2007).

Schizophrenia is a chronic serious psychiatric disorder characterized by psychotic symptoms, cognitive and interpersonal deficits (Penadés & Catalán, 2012), generally effecting about 24 million individuals across the world with an age range of between 15-45 years; typically its onset is in early adulthood (Vancampfort, et al., 2013). Schizophrenia is considered as the fifth leading cause of loss of Daly's over world for the age group 15-44 years and contributes to the global burden of disease and cause disability (WHO, 2014).

The cause of schizophrenia is still ambiguous. No single theory confirm a clear-cut explanation for the disorder. Schizophrenia possibly, results from a combination of factors including biological, psychological, and environmental factors (Townsend, 2015).

Treatment of schizophrenia involve psychopharmacological and psycho-social approaches. More than 50 % of schizophrenia patients do not have access to the appropriate care and lack of social support during administration of treatment. All of these issues have influence on the adherence of patients to treatment modalities resulting in poor adherence (WHO, 2014).

Centres for Disease and Prevention (CDC) reports that prevalence estimates range between 0.5% and 1% regardless of racial, ethnic or economic background. Patients with schizophrenia lead to high risk for suicide. Approximately one-third will attempt suicide and, eventually, about 1 out of 10 will take their own lives (CDC, 2014).

The economic burden of schizophrenia for direct health care and non-health care costs to be 2.02 billion Canadian dollars in 20012. This combined with a high unemployment rate, morbidity and mortality rates. Studies have indicated that 25% of those having schizophrenia recover completely, 50% are improved over a 10-year period, and 25% do not improve over time (CDC, 2014).

Tele-nursing intervention defined as the delivery, management and coordination of care and services provided via information and telecommunication

technologies, based on nurses meet the health needs of patients using information, communication and web-based systems (Stentzel, et al., 2015). Technologies used in tele-nursing include: telephones (land lines, cellphones and smart phones), personal digital assistants (PDAs, Smart Phones), facsimile machines (faxes), tablets, bedside computers, Internet, video and audio conferencing, teleradiology, computer information systems and telerobotics (Schlachta-Fairchild et al., 2010).

Registered nurses engaged in tele-nursing continue to use the nursing process to assess, plan, implement, evaluate and document nursing care. They are also implicated in the provision of information, referrals, education and support. However, instead of establishing therapeutic nurse-client relationships in-person, tele-nursing relationships are established through the use of telephones, computers, the Internet, or other communication technologies (American Association of Critical Care Nurses, 2013).

The primary objective of this review is to assess whether tele-psychiatry; regular telephone calls and short text messages can progress the medication adherence of patients with schizophrenia. Secondary objectives are the decreased in rehospitalization rates, the improvement of quality of life and of the severity of symptoms.

Significance

Poor treatment adherence in patients with schizophrenia limits the effectiveness of antipsychotic medications and is connected with an increased risk of relapse and rehospitalization. So more researches are needed to investigate the effectiveness of tele-nursing intervention to enhance long-term adherence for schizophrenic patients.

PICOT Questions

1) Does tele-nursing intervention increase medication adherence in patients with schizophrenia?
2) What is the difference between patients who extradite tele-nursing intervention and patients who did not receive tele-nursing intervention?

Table 1: PICOT Summary

PICOT	
Patient population	The population of this review is adult at least 18 years old schizophrenia patients who received tele-nursing intervention, receiving anti-psychotic medications which prescribed upon discharge.
Intervention	The intervention is tele-nursing intervention.
Comparison	The comparison is between patients who received tele-nursing intervention and patients who did not receive tele-nursing intervention.
Outcome	The desired outcome is to prevent relapse, reduce rehospitalization rates and severity of symptoms, and improve the medication adherence among patients with schizophrenia.
Timeframe	Tele-nursing intervention was provided for three to six months-follow-ups will be conducted by telephone calls and text messages by the nurses.

Search Strategy

The search strategy used to create this evidence is designed to capture relevant clinical and psychological science literature to retrieve the published evidence on the topic. Cumulative Index of Nursing Allied and Health Literature (CINAHL), OVID, Pubmed, Wiley, Science Direct and PsycINFO were searched for relevant information from 2010 until 2016.

Multiple words were used to search for literature on tele-nursing intervention effects on patients with schizophrenia. The following words were placed in the online indexes individually and in combination with one another: tele-nursing intervention, tele-nursing and schizophrenia.

All participants met the following inclusion criteria were: Adult schizophrenia patients, receiving anti-psychotic medications which prescribed upon discharge, using tele-nursing intervention to increase medication adherence, articles written in English language and randomized controlled trials, able to read and write English, they provided written informed consent. Exclusion criteria were: planned inpatient treatments and patients being non-reachable by phone or other communication methods, studies that were only single case case reports and articles not written in English language.

Findings

A search in databases from 2010 to 2015 was completed. Searching in databases resulted in 18 articles; after analyzing these articles based on the study purpose, objectives, design, major results and conclusion, the selected articles were seven articles which matched the previous inclusion criteria.

Literature Review

Introduction

Adherence problems experiment in the treatment process may cause recurrence of disease, raise in implementation 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 (Uslu & Buldukoglu, 2015).

Accordingly, administration of the tele-nursing technologies in the care process of schizophrenia patients is an effective implementation 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, increases access to health services, decreases costs, offers developed education opportunities, develops quality of care, promote life quality, and provides

social support chance, this service is implemented through telephone calls, text messages, video-conference and internet (Kasckow et al., 2014).

The purpose of this literature is to examine the efficacy, acceptability and satisfaction with tele-nursing intervention among patients who suffers schizophrenia by review six research articles about the importance of these strategies in reduction of rehospitalization rates, the improvement of quality of life and of the severity of symptoms.

Related Studies

The Corroborative Evidences

In general, there are many studies of first level of evidence based about the effect of tele-nursing intervention among schizophrenic patients; The first study is the effects of psychoeducation and telepsychiatric follow-up on social functioning and medication adherence in the patients with schizophrenia reported by Özkan, Erdem, Özsoy & Zararsız (2013) conducted a randomized-controlled experimental study; used tele-nursing intervention for patients in the experiment group, this intervention was not given to the control group, in which a weekly 15-minute-long telephone monitoring was utilized to the experiment group on a standard date and time for six month. The content of the telephone monitoring activities consisted of repeating mental training, consultancy, benefits, side effects of non-adherence and support given to the patients when they experienced difficulties. Patients from the experiment and the control groups were measured with designated tools during the six-month long telephone monitoring process.

Ozkan et al. (2013) used two measures in their research. The first measure of these was "The Social Functioning Scale" (SFS) that was used to evaluate social functionality of schizophrenia patients. The second one was "The Medication Adherence Rating Scale" (MARS), which was used to measure the treatment adherence of psychiatric patients. It was found that average treatment adherence and social functionality scores of patients in experiment group increased.

Beebe, Smith & Phillips (2014), in their study; A comparison of telephone and texting interventions for persons with schizophrenia(TIPS), which targeted the effect of usage of short messages, or the TIPS, or combined short messages and the TIPS on symptom level and medication adherence of schizophrenia patients. In which 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 interfered through both a short message and the TIPS method. All participants were provided a mobile with unlimited call and messaging packages. Moreover, their residential places were paid a visit after receiving an appointment for medication inventory monthly. The TIPS method was applied for a three-month on weekly basis according to the TIPS protocol. Patients were called by a trained nurse and their responses were kept recorded. Beebe, Smith & Phillips in thier study used "Brief Psychiatric Rating Scale – BPRS" scores in both the pre- and post-study period. While psychiatric medication adherence score of the third group was found higher and symptom level was lower (Beebe, Smith & Phillips, 2014).

Moreover, Montes, Maurino, Diez & Saiz-Ruiz (2010) conducted Telephone-based nursing strategy to improve adherence to antipsychotic treatment in schizophrenia: A controlled trial, investigated the effect of a telephone-based intervention by a nurse on adherence of schizophrenia patients to anti-psychotic treatment. In this scope, the total patients was (928), the control group (472) was interfered by a conventional method while the experiment group afford intervention based on telephone-nursing. Each patient from the experiment group (456) was given the standard telephone interview on the 4th, 8th, and 12th weeks with the help 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.

Montes et al. (2010) used four measures in their research. The first measure was "Drug Attitude Inventory" (DAI-10), which was advanced to measure subjective responses toward anti-psychotic treatment and an attitude of the chronic schizophrenia patients.ng and non-judgmental way to minimize social desirability bias in admitting non-adherent behavior. The mental health status is deliberated by the Brief Psychiatric Rating Scale (BPRS). This instrument consists of 18 items to measure the severity of psychiatric symptoms. Quality of life will be measured on the basis of the short version of the subjective instrument World Health Organization Quality of Life (WHOQOL-BREF), which is designed for generic use.

Finally, the psychological, social and occupational function levels will be assessed by the Global Assessment of Functioning (GAF) on a scale from 1 to 100, intended as a hypothetical continuum of mental health (score 91–100) to illness (score 1–10). This study show positive results regarding severe mental disorders; in which regular telephone calls and text messages improve medication adherence, bridge gaps between in and out patient treatments, reduction of rehospitalization rates and improvement of quality of life (Sentezel et al., 2015). Also, a systematic review of telehealth tools and interventions

to support family caregivers done by Nai-Ching Chi and George Demiris in 2015 indicated that technology can support caregivers and facilitate better coping, help them to make care giving more efficient, effective, safer and less stressful when delivering care to the patients. The review was conducted in 2014 using the Embase, CINHAL, Cochrane and PubMed databases with combinations of keywords including "telehealth", "telemedicine", "telenursing", "telecare", "telemonitoring", "caregiver" and "family." The initial search found 4205 articles matching the keywords. A total of 65 articles were included in the review. Each article was also scored for the level of evidence using the Oxford Centre for Evidence-based Medicine framework to evaluate the strength of the findings (Chi & Demiris, 2015).

Evidence from clinical trials indicates that the use of technology can enhance the care giving experience and facilitate shared decision making, where patients and their families are actively involved in the care process and participate in the decision making process, the availability of tools that facilitate access to information and support services is important. This review demonstrates that it can positively affect chronic disease care, home and hospice care (Chi & Demiris, 2015).

The last study is factors associated with the effectiveness of a telephone-based nursing strategy for enhancing medication adherence in schizophrenia done by Montes, Maurino, Diez and Saiz-Ruiz (2011) which is randomized controlled trial, aimed to identify factors associated with success following a 4-month telephone-based nursing strategy for improving adherence to maintenance antipsychotic treatment in patients with schizophrenia. The patients randomized to the intervention group (n=424) received a standardized telephone call made by a nurse at weeks 4, 8, and 12. Patients assigned to the control group (n=441) were scheduled for the final visit four months after inclusion, without telephone calls, and continuing the usual period of clinical care among stable outpatients with schizophrenia. Each telephone call consisted of a brief semi-structured assessment of medication adherence.

Adherence to antipsychotic treatment was estimated by the treating psychiatrist and the nurse according to the Register of Adherence to Treatment scale (RAT): high (adherence with 80% of doses), moderate (adherence with 60-79% of doses), low (adherence with 20-59% of doses), and nil (adherence with < 20% of doses). In summary, the results of this study detect that a telephone call made by a mental health nurse is a successful intervention for enhancing adherence in stable patients with schizophrenia, especially useful for improving adherence in those patients with a negative attitude towards antipsychotic treatment (Montes et al., 2011).

The Contrary Evidences

The evidences of all the researches reveal that there are no studies that mention negative outcomes of tele-nursing interventions among schizophrenia patients.

The results obtained from these research articles are summarizing in table below.

Summary

Results of these studies investigated that tele-nursing interventions for schizophrenia patients and their effects, 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.

Strength Points

The strength of this review is novel and innovative design. Most reviews examine the association between two variables, and control for others. In this review the information comprehends contemporary studies from 2010- 2015 which comprises an original and unique topic. Using of first level of the evidence, good background information, the study included in developed countries, Control group, interventions, and frequency of measurement clearly identified and large sample size all of these strength this review.

Weakness Points

The weakness of this review that the variations in measurement of medication adherence influence the comparison of the results from the different articles. And data assessment tools were not tested in terms of reliability and validity.

Recommendations

Establish a trusting relationship with a schizophrenia patient is very important; Provide clinical protocols, guidelines out-patients care services; Provide regular counseling sessions, follow up, intensive programs for patients and specialty centers are needed to reduce rehospitalization rates, to improve quality of life and to decrease severity of symptoms. Also, establish good quality longitudinal researches to explore the effectiveness of tele-nursing interventions among schizophrenia patients.

Implications

The author will use this evidence in the practice in the future at the clinical area, giving actual training and experience as to how patients with schizophrenia will react to tele-nursing interventions. There is good guide that this recommendation will progress important health outcomes and concludes that benefits substantially outweigh harm. The intervention is mainly cheap, easy to conduct, and

easily comprehended for both nursing stuff and patients or patient health care providers so it is feasible from the theoretical point view.

Summary

Tele-nursing practices allow application of telecommunication technologies to strengthen patient care; nurses integrate tele-nursing practices into the caring process. Thus, access to care can be enhanced and may provide support to the individuals with several chronic disorders such as schizophrenia. In addition, cost of health service would be decreased and self-efficiency of individuals with chronic diseases would increase.

Table 2: This table summarizes the results obtained from the seven research article

Article	Author, year	Name the design	Sampling strategy	Main results	Level of the evidence
The effects of psychoeducation and telepsychiatric follow-up on social functioning and medication adherence in the patients with schizophrenia	Özkan, Erdem, Özsoy & Zararsız,2013	Randomized-Controlled Experimental Study	n = 62 Experiment group = 32 Control group = 30	It was found that average treatment adherence and social functionality scores of patients in experiment group increased	Level 1
A comparison of telephone and texting interventions for persons with schizophrenia spectrum disorders	Beebe, Smith & Phillips, 2014		n = 30 1st Group = 10 2nd Group = 10 3rd Group = 10	While psychiatric medication adherence score of the 3rd group was found higher and Symptom level was lower.	Level 1
Telephone-based nursing strategy to improve adherence to antipsychotic treatment in schizophrenia: A controlled trial	Montes, Maurino, Diez & Saiz-Ruiz, 2010	Randomized Controlled Trial	n = 928 Experiment group= 456 Control group = 472	It was determined that experiment group exhibits higher adherence to treatment	Level 1
Telepsychiatry in the Assessment and Treatment of Schizophrenia	Kasckow et al., 2014	Systematic Review	Review of studies published between 1960 and 2010, using MEDLINE, PsycINFO, CINAHL, the Cochrane library, the Cochrane Database of Systematic Reviews, the Database of Abstracts of Reviews of Effects, and EMBASE. To assess the efficacy of tele-psychiatry in the the assessment and treatment of schizophrenia. A total of 390 articles, of which 18 unique articles were relevant	Evidence from clinical trials indicates that telephone-based, internet-based or video-based telehealth systems modalities improve patient outcomes, decrease relapse rate and rehospitalization	Level 1
Tecla: a telephone- and text-message based telemedical concept for patients with severe mental health disorders – study protocol for a controlled, randomized, study	Stentzel et al., 2015	Randomized Controlled Trial	Patient recruitment (N=190) Control group=95 Intervention group=95	This study show positive results regarding severe mental disorders; in which regular telephone calls and text messages improve medication adherence, bridge gaps between in and out patient treatments, reduction of rehospitalization rates and improvement of quality of life	Level 1
A systematic review of telehealth tools and interventions to support family caregivers	Chi & Demiris, 2015	Systematic Review	A total of 65 articles were included in the review. Each article was also scored for the level of evidence using the Oxford Centre for Evidence-based Medicine framework to evaluate the strength of the findings	The use of technology can enhance the care giving experience and facilitate shared decision making	Level 1
Factors Associated with the Effectiveness of a Telephone-Based Nursing Strategy for Enhancing Medication Adherence in Schizophrenia	Montes, Maurino, Diez & Saiz-Ruiz, 2011	Randomized Controlled Trial	N=865 Intervention group =424, Control group =441	A telephone call made by a mental health nurse is a successful intervention for enhancing adherence in stable patients with schizophrenia	Level 1

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