APPLICATION OF TELENURSING IN THE REHABILITATION OF ELDERLY HIP FRACTURE PATIENTS AT HOME-A LITERATURE REVIEW

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Jesse Kago
Degree Programme in Nursing
Thesis
April, 2011
The purpose of this review was to discuss how literature describes telenursing in providing rehabilitative care to the elderly hip fracture patients at home. It also described the various repercussions the hip fracture condition is inflicting on the patient and the hospitals and subsequently the healthcare system. The research question for this thesis was: How is telenursing applied in the rehabilitative care of elderly hip fracture patients at home?

Systematic literature review was used as the study method; literature search was conducted on existing current scientific articles, books, journals and the internet. The data was determined from the search by their relevance to the purpose of articles’ study and articles’ research questions and analyzed through inductive qualitative analysis.

The findings indicated that telenursing was an emerging and expanding potential means of delivering rehabilitative care to patients at home or in other care facilities. It had been proved to be successful in caring for other chronic conditions and suggested that it could also be applied to provide rehabilitative care for elderly hip fracture patients. The findings also suggested that telenursing improved the health outcomes for the patients. Telenursing services also benefited the patient with a multidisciplinary team, resulted in patient satisfaction and demonstrated to be cost efficient for both the patients and organisations providing healthcare. However the findings revealed that a more specific design was required for the intervention of using telenursing to care for hip fracture patients, since literature had mainly described care in other conditions: from this finding, it was concluded that more research could be undertaken by carrying out more clinical experiments to come up with solid scientific evidence for the design.

Keywords: telenursing, hip fracture, rehabilitative nursing, the elderly
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1 Introduction

Telenursing forms a component of telehealth, which focuses on the delivery of nursing care, guidance and counselling and nursing practice in the health care of patients through the use of telecommunications technologies. Telenursing includes all contact that is made between the medical staff, including doctors, nurses and allied health professionals and the patients by the use of telephone, radio, television, video, internet and intranet. For example this includes a telephone call between a nurse and a patient or between a doctor and patient in the benefit of offering health care to the patient (Dickson et al. 2008).

This area of nursing has the capability to change the way care is accorded to outpatients regardless of their location or degree of distance from the primary health care centre (Naditz 2009). It can be defined as a means of providing nursing care using the nursing process to care for individuals or specific patient populations, such as groups of people in a remote area, using telecommunication devices. It focuses on coordination and delivery of care (Naditz 2009).

Hip fractures are a commonly occurring health issue amongst the elderly, with the hip fracture prevalence in Finland in 2010 being estimated to be 10 650 cases per year based on recent trends (Kannus et al. 1999). Hip fractures resulting from decreased bone density and therefore increased brittle nature of bones are referred to as osteoporotic hip fractures. These fractures can create a large burden on the patient and the healthcare system by means of occupying beds, draining resources from hospital funds by occupation of the nursing staff. However recent developments in the use of telenursing will allow for the care of this health issue to be addressed without compromising on the care given and safety of the patient. The applications of telenursing in the rehabilitative care at home will be discussed in this thesis with current literature provided as evidence.
2 Purpose statement and research questions

The purpose of this study is to discuss how literature describes telenursing in providing rehabilitative care to the elderly hip fracture patients at home. The research question is:

How is telenursing applied in the rehabilitative care of elderly hip fracture patients at home?

3 Systematic literature review

The method used in this study is systematic literature review. Systematic literature review is a replica of scientific and transparent process that aims to minimize bias through exhaustive literature searches of published studies and by providing an audit trail of the reviewer's decisions, procedures and conclusions (Tranfield, Denyer & Smart. 2003).

Literature review is a process of identifying, evaluating, summarizing and synthesizing the previous research on a topic. The goal being to competently retrieve sufficient number of literature, critically evaluate and synthesize them in order to build up a strong knowledge foundation of a comprehensible study (LoBiondo-Wood & Haber 2006).

Research is used in nursing to promote evidence-based nursing, with the purpose of presenting strong information and knowledge based on scientific evidence in order to improve the nursing care practice. Literature is reviewed through the identification, selection, critical analysis and written description of existing information (Polit and Beck 2004).

3.1 Data

3.1.1 Literature search

Literature search is a method of data collection that involves identification and examination of research reports, published papers, and books. The literature search was executed systematically to ensure the best available evidence was gathered by finding articles that were mostly relevant to the purpose of the study and the research questions.
The search was carried out in Wiley online library, proQuest central database, Pub Med database, Science Direct database and Sage database. Google scholar was also used to obtain articles that could not be retrieved as full texts directly from the databases.

As the search proceeded, a more precise method known as the Boolean search method was applied to acquire further evidence on the research study. An online vocabulary look up aid known as MeSh browser used with medical subjects was used to confirm relevant keywords. The Boolean search method involved a combination of the two or more keywords and the use of capitalized “AND” in between them in order to form a phrase, for example “telenursing AND elderly”

The following table illustrates the Boolean search method used in order to retrieve the potential data used in the research; it indicates the number of hits obtained from the various search engines used, the number of relevant hits obtained from each search engine and the total number of hits that were included in the research. The zero indicates that the database did not yield any results due lack of connection to the database at the time of literature search or lack of relevant literature. Table 1; page 5

Table 1: Shows search words used and hits obtained from various search engines e.g. search-word “telenursing AND rehabilitative nursing care” results showed, 1 on Wiley online library; 0 ProQuest; 97 Pub Med; 0 science direct.

<table>
<thead>
<tr>
<th>KEYWORDS</th>
<th>Wiley Online Library</th>
<th>ProQuest Central</th>
<th>Pub Med</th>
<th>Science Direct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telenursing AND rehabilitative nursing care</td>
<td>1</td>
<td>0</td>
<td>97</td>
<td>0</td>
</tr>
<tr>
<td>Telenursing AND hip fracture</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Telenursing AND elderly</td>
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<td>0</td>
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<td>4</td>
<td>1</td>
<td>0</td>
<td>1</td>
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</tbody>
</table>
3.1.2 Data screening

The screening of data was done by applying the inclusion and exclusion criteria. Literature search was limited to articles published from 1999 to date so as to accommodate the most current articles that were relevant to the research study. The publications were to be in English, full texts and free. Publications which were not scientific journal articles, theoretical books or national reports were excluded. Publications that did not conflict with the previously mentioned exclusion criteria were therefore accepted as the data for analysis.

The data retrieved during the literature search was compared to the above inclusion and exclusion criteria. The criterion was used to determine which data would then be collected and analysed. Table 2; page 6

Table 2: Inclusion and exclusion criteria

<table>
<thead>
<tr>
<th>INCLUSION CRITERIA</th>
<th>EXCLUSION CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articles published after 1999.</td>
<td>Articles published before 1999</td>
</tr>
<tr>
<td>Full text studies</td>
<td>Studies not in full text</td>
</tr>
<tr>
<td>Articles published in English language</td>
<td>Articles published in other languages other than English</td>
</tr>
<tr>
<td>Studies relevant to the purpose of this study</td>
<td>Studies not relevant to the purpose of this study</td>
</tr>
</tbody>
</table>

3.1.3 Data extraction

The most relevant articles to the purpose of the study were selected after screening the data, since some of the search engines gave back many articles, some of the articles still covered broader topics on the study, therefore articles deemed relevant were those that met both the inclusion and exclusion criteria from the data screening. From the process, 28 articles were identified and saved in library work space portal. To further narrow the scope of the data and to ensure full relevance, data extraction was done by considering the purpose statement, research question and the aim of the study.

The articles realized were 8, which were used in the data analysis, they have been described in the appendices by; Author, year of publication, title, publication place i.e. journal, pur-
pose of the article, key findings of the article and the significance of the article to the study, i.e. In the issue of Telemedicine and e-health, vol. 14, no. 5; Dickson et al. (2008) carried out a study on Development of multidisciplinary osteoporosis Telehealth program, the data was collected from questionnaires from patients to find out their satisfaction with the programme of telenursing, the findings significantly showed that patients were highly satisfied at 92% and would not only use the programme again but also recommend it to others. The data realized from the extraction process is shown below. Table 3; page 7

Table 3: Reviewed articles

<table>
<thead>
<tr>
<th>Author and Year of Publication</th>
<th>Publication</th>
<th>Title of the Article</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dickson et al. (2008)</td>
<td>Telemedicine and e-Health</td>
<td>Development of a Multidisciplinary Osteoporosis Telehealth Programmes</td>
</tr>
<tr>
<td>Goodwin (2007)</td>
<td>Nursing Leadership</td>
<td>Telephone Nursing: An Emerging Practice</td>
</tr>
<tr>
<td>Greenberg (2000)</td>
<td>Nursing Economics</td>
<td>Telephone nursing: Evidence of client and Organizational benefits</td>
</tr>
</tbody>
</table>
3.1.4 Data analysis

The data collected was analysed using qualitative content analysis. It involved the systematic reading of the articles, publications, pointing out the significant areas, determining the core meaning of important content, assembling the core meanings of the data from the articles and interpretation of data (LoBiondo-Wood & Haber, 2006).

The content of the data is read through and examined carefully to realize the relevant contents to the study. In this study, the selected articles were analyzed using qualitative inductive content analysis. Content analysis is a research technique which can be used for objective, systematic and qualitative description of documentary evidence. (LoBiondo-Wood & Haber, 2006 559-575).

The main objective in data analysis is to get familiar with the data. It is therefore important to understand the data before categorizing them so as to come up with relevant categories. The writer should read all the data collected carefully and categorize them into relevant
groups accordingly. Information was mainly retrieved from the abstract, findings and discussions parts of the articles. The main goal in qualitative analysis of data is to organize the gathered information to attain a conclusion and data conveyed in a research report.” (Polit, Tatano & Hungler, 2001)

The analysis began by reading through the articles several times and relating them to the purpose statement and research question of the thesis; during the reading process, short phrases that were relevant were developed. The phrases realized were further read through and analysed, where those that had close similarity and relation were grouped together and a relevant descriptive phrase given to them. A main title was then coined for the descriptive phrases.

For example, the phrases; Remote video technology for multidisciplinary access to specialists for chronic conditions; reduced acute deterioration of chronic conditions; reduced congenital heart failure due to remote monitoring, were grouped together and described as Benefits from a multidisciplinary team. Other descriptive phrases realized were, improved outcomes from healthcare, patient satisfaction with telenursing services and cost efficiency for the patients and organizations. These descriptive phrases were grouped together and described as Potential of rehabilitative care through telenursing. The diagram below illustrates the data analysis. Figure 1; page 10
Effectiveness of telehealth models in patient care; improved patient recovery and reduced complications; positive responses on issues related to the level of care

Remote video technology for multidisciplinary access to specialists for chronic conditions; reduced acute deterioration of chronic conditions; reduced congenital heart failure due to remote monitoring

95% of patients satisfied with telenursing service; service well received by patients; patient reassured and panic reduced; patients would use it again and recommend to others

Remote video technology has a potential for cost saving; multidisciplinary access to specialists reduces cost; minimized costs in transport

Patients benefits from a multidisciplinary team

Improved outcomes from healthcare

Patient Satisfaction with telenursing services

Cost Efficiency for the patients and organisations

Potential of Rehabilitative Care through Telenursing

Figure 1: Illustration of Data analysis process.
Findings

The information and evidence gathered from the analysis of data was carefully studied. From the analysis, information on the potential of rehabilitative care through telenursing at home and outcomes of telenursing service were identified and discussed. The information gathered was used to answer the purpose of the study and the research question.

4.1 Potential of rehabilitative care through telenursing

Telenursing can be defined as a means of providing nursing care using the nursing process to care for individuals or specific patient populations, such as groups of people in a remote area, using telecommunication devices. The discipline of telenursing is an emerging practice that offers positive promises in providing care to patients in their home environments.

Although research on this topic is limited, existing research was equally promising in showing the successes of applying telenursing programs in rehabilitative care as well as nursing care for other conditions that needed close monitoring, from literature the programmes included; remote video technology, telephone services or telephone nursing, video based home care i.e. telecare, call nurses in Emergency rooms.

From these programmes, patients’ recovery could be directly monitored and also observed. Research demonstrated that telenursing could provide a multidisciplinary approach, considering pharmaceutical options, dietary modifications, appropriate exercise programs, and fall prevention strategies, these factors were considered to be fundamental in the care of patients recovering from hip fractures. From these programs, more research could be carried out to develop a specific care design that could be used in the rehabilitative care of hip fractures in the elderly at home. Studies reviewed suggested that telenursing was a viable and realistic nursing care model with advantages that included; reduced economic costs, patient satisfaction and increased patient accessibility to multidisciplinary specialists’ care.

4.1.1 Benefits from a multidisciplinary team

The variables associated with the occurrence of hip fractures include; gender, premature menopause, age, family history, diet, Vitamin D and Calcium deficiency, impaired vision, falls osteoporosis and surgery. Research suggested that acute care and treatment of hip fractures usually occurred in a hospital facility where most often surgical measures were carried out.
Beyond the initial surgical intervention phase of treatment, there was no evidence of further treatment being required of surgical nature and therefore medical practitioners might then focus on treating diseases or elements that led to the fracture i.e. osteoporosis and preventive action also taken in addressing the contributing factors to the disease, for example the treatment of nutritional considerations by means of supplements of Calcium and Vitamin D.

Literature further suggested that, when the surgical treatment had been administered and the initial stages of recovery achieved at the hospital, application of home nursing or tele-nursing as a means of providing nursing care or prevention of injuries could potentially be implemented in the home environment with a certain degree of ease.

Research demonstrated that through applications of Remote Video Technology and Video based homecare i.e. telecare; telenursing could provide a multidisciplinary approach, considering pharmaceutical options, dietary modifications, appropriate exercise programs, and fall prevention strategies. These factors were considered to be fundamental in the care of patients recovering from hip fractures especially from an initial complication or condition such as osteoporotic condition. For the purpose of this form of care it was essential that the current conventional nursing care for hip fracture patients at the hospital was understood, this was essential in formulating sound and effective nursing care plans for the patient in the home environment.

4.1.2 Improved outcomes of healthcare

Research showed that telenursing had been applied in the care programs for patients with other chronic conditions i.e. Congenital Heart Failure and proved to be successful in reducing deteriorations and acute attacks. Telenursing was also applied in monitoring the conditions of patients at home with chronic conditions or complicated diseases; coordinating care for patients with multiple conditions and also encouraging and empowering patients to take more responsibility for their health through education by video conference.

A research conducted in the United States of America, found that the use of telenursing services in a control group with only a primary care provider and a video telecare group, was more desirable in comparison to other methods. This study found that those who followed the telenursing intervention programme were less likely to be readmitted to hospital or to have to visit the emergency department. The study also found that the patient to health care professional physical interactions were shorter in comparison to conventional care method but with no decline in patient satisfaction. The study concluded that this method was most effective when used in the course of treatment and care for those with chronic illnesses. These patients did not need to have visits to the hospitals since their conditions were closely monitored, thereby increasing their rest and quick recovery. Research also showed that, through
Telenursing patients’ compliance to prescribed care improved due to the fact that they were closely monitored, patients discharged early from hospitals could also be monitored closely at home for any complications e.g. day surgery patients, this greatly improved the patients’ recovery and consequently reduced complications.

From the success of these programmes, the hip fracture patients could also be closely monitored during their recovery at home and educated and guided on how to help in the management of their conditions to full recovery with the help of their families in their home environments. This would also help reduce the social isolation from hospitalisation.

4.1.3 Patient satisfaction with telenursing services

In a study carried out, outstanding results were achieved in regards to patient satisfaction. When patients were asked if they ‘received appropriate level of personal care and attention from my provider when using remote video visit system’ i.e. technology used to conduct tele-nursing, 53.3% strongly agreed and 41.7% agreed. This essentially once extrapolated showed that on average 95% of patients were satisfied with the service which was provided to them. It was also realised from the ER desk that patients were satisfied with “call centre nurses”, since the nurses could help answer their questions within their scope as accurately as possible thereby reassuring the patients who were already panicking and thus saving them from having to go to the ER if not necessary. These nurses also helped to identify patients to be treated sooner than the patients might have thought thereby helping to save lives.

In another study, it was established that Telehealth i.e. telephone nursing, yielded a 90-100% rate of positive responses towards issues of satisfaction. This was a very promising result and suggested that patients would respond well to other telenursing models designed to care for patients in the future. Research also supported this positive result in regards to quality of care to patients. This research found that 66-67% of patients were satisfied with the level of care accorded to them.

4.1.4 Cost efficiency for the patients and organisations

The event of a hip fracture had a crippling impact on the patient and the hospital, both socially and economically, if the rehabilitative nursing care was exclusively carried out in the hospital. A substantial amount of money was associated with exclusively caring for hip fracture patient in a hospital facility with the required nursing staff. In a study conducted in the United States, it was estimated that throughout the lifetime of the patient they would incur $81,300 US in costs, with 44% of these costs being contributed to by the requirement for nursing facilities. Research also showed that there were both economic costs and productivity
costs incurred due to patients’ absence from work and premature death. The total cost on a single hip fracture patient including inpatient and outpatient costs was calculated to be 11,582 US Dollars, approximately 9,234 EUR. Costs related to premature death were estimated to be in the range of $4.5 to $6.3 billion US dollars per year and another $74 to $104 million US dollars lost in productivity loss. The study also considered the costs of institutional care that was required for two thirds of osteoporotic hip fracture patients and calculated this cost to be as high as $7,051.52 million per year.

In another study conducted in the United Kingdom, UK, where 100 patients who were admitted to hospital facilities for the treatment of hip fractures were observed. Findings from this study showed that the average stay for these patients was 23 days, with an average cost per patient calculated to be £12,163 approximately 14,544 EUR. This was considerably, a large amount of money, which could potentially be saved if telenursing was introduced, since it would remove the need for hospital rehabilitation care and provide remote care to the patients from the comfort of their own home environment and surrounded and supported by their families.

Literature suggested that the use of telenursing was economical as it catered for all patients regardless of their distance from their primary healthcare location, it minimised costs in transport for other medical practitioners, the nurse and the patient, since the approach was strengthened by the collaboration of multiple health disciplines in a single case through technology. It was also realised that the use of telenursing, telehealth, resulted in reduced costs, enabled 24 hour access to care and created a greater access to healthcare services for patients in remote places. It also made it possible for a single nurse to help a larger number of patients in less time since no travelling was required. This proved to be extremely beneficial as the costs presented previously in regards to the treatment and nursing care for hip fracture patients were phenomenally high for both patients and the health care system. Greater access also improved equity as it allowed health care to be accessible by all regardless of their location.
5 Discussion

This section discussed the ethical considerations taken into account during the study and the trustworthiness of the findings. It also included the discussion of the findings and the conclusions and recommendations from the study.

5.1 Ethical considerations

The ethical considerations undertaken during this literature review consisted of the presumption that the articles selected and used in the analysis followed ethical guidelines by ensuring that participant’s anonymity and confidentiality was maintained and informed consent was obtained, it was also presumed that the due process of the methodology used in writing the articles was strictly followed. The references for the data used are acknowledged and documented in the reference page. The final study findings were based on the scientific articles and the writers’ views were not included.

At the beginning of the study, the authors of this document informed the supervisors at Laurrea University of Applied Sciences concerned with research projects about the study, and sought permission to carry out this study; the supervisors granted the permission sought. Nurses as consumers of research must acknowledge legal and ethical issues of research study to evaluate whether the researcher has ensured appropriate human rights (LoBiondo & Haber 2006, 314). The authors ensured that the process of the methodology was duly followed during the study and compilation of this document. Ethics is a form of philosophic inquiry used to investigate morality and helps in resolution of moral dilemmas (Singer, 1993). Collection of data from people during research leads to issues that can be resolved as well as challenged in ethical parameters (Fry & Johnstone, 2002).

5.2 Trustworthiness

The literature search was conducted only from reliable electronic databases such as WILEY ONLINE LIBRARY, proQuest CENTRAL, PUB MED, SCIENCE DIRECT and SAGE, and the data used was freely available, hence the data used was presumed to be valid. Legitimate research is research that consists of trustworthy findings and to some extent is an indicator of successful research methodology (Graneheim & Lundman 2004). The articles from the data used in this study were compared against each other to form different themes, issues of common themes were grouped together during analysis, this showed that different articles were based on the same theme and came up with an almost similar conclusion. The method used in this research study was systematic literature review, the data
collected and analysed were from articles that were assumed here to have undergone thorough vetting to qualify to be published in journals of repute in the healthcare field and were therefore reliable and credible.

Credibility requires that the data is interpreted in an appropriate manner and that an adequate volume of information was considered to draw final conclusions (Graneheim & Lundman 2004). The articles from the data used in this study were compared against each other to form different categories, issues of common information were grouped together during analysis, this showed that different articles were based on similar information and came up with an almost similar conclusion; this in effect proved that the articles were reliable and valid.

Validity establishes whether or not the research addresses the purpose of the experiment (Long & Johnson 2000).

5.3 Discussion of findings

The information obtained from this study are extremely positive and has helped promote telenursing as an emerging recognized and consistent means through which quality rehabilitative care can be carried out for the elderly patients recovering from hip fractures at home. It has also been shown that the nursing care for this condition in the hospital creates a huge burden on the society, healthcare system and the economy (Braithwaite, Nananda & Wong, 2003). The findings have shown that Telenursing method can help reduce this burden as well as costs, while at the same time maintain and deliver patient satisfaction and effective care (Greenberg, 2000). This would reduce the burden on the healthcare system and also successfully provide greater access to health services and nursing care for patients in remote and places who are equipped with telecommunication channels.

Since telenursing has been applied in the care of chronic conditions at home, the same idea can be used to offer rehabilitative care to the elderly patients at home who have recently suffered from a hip fracture and have undergone treatment at the hospital (Jerant et al. 2003). If a nursing care plan can be designed to fit the needs of the hip fracture patients and strictly adhered to, it can get the best results and experience for the patient.

The successes in the telenursing care of patients with other chronic diseases proves that this method of nursing could be very beneficial and provide the same benefits as those experienced by the ordinary conventional interventions (Jerant et al. 2003). Although research on this topic is limited, existing research is equally promising in showing the successes of applying telenursing programs in rehabilitative care as well as nursing care for other conditions that need close monitoring, from literature the programmes include; remote video technolo-
gy, telephone services (telephone nursing), video based home care (telecare), call nurses (in ERs) (Johnstone et al. 2000). From these programmes, patients’ recovery can be directly monitored and also observed.

Research demonstrated that telenursing could provide a multidisciplinary approach, considering pharmaceutical options, dietary modifications, appropriate exercise programs, and fall prevention strategies, these factors are considered to be fundamental in the care of patients recovering from hip fractures (Dickson et al. 2008). From these programs, more research can be carried out to develop a specific care design that can be used in the rehabilitative care of hip fractures in the elderly at home in the research.

It was also suggested that for the long term nursing care for patients with chronic conditions, telenursing is preferable as it lowers costs associated with transport, hospitality at the hospital, nursing staff and bed occupation in the hospital, thus reducing the burden on the health system, the economic burden on the patients’ families and social isolation of the patients’ due to hospitalization, while still retaining patient satisfaction and effective care (Hagan et al. 2000). With telenursing the patients are empowered by being educated on how to help manage their conditions, this makes them and their families more involved in their own care, and at the same time enjoy the socialization provided by the presence of their families in their own home environments.

5.4 Conclusions and recommendations

Hip fracture prevalence in Finland is currently estimated to be at 10,650 cases per year (Kannus et al. 1999). If current trends persist the prevalence of hip fractures may soar as high as 19,000 cases per year, an approximately two fold increase (Kannus et al. 1999). This high prevalence will contribute to an increase in the costs and burden associated with this injury, to the patients and the hospitals and to a larger scope the healthcare system and the economy. Therefore an innovative solution to address this emerging problem brought about by the aging population is required.

In this thesis a solution is promoted, and it is suggested to be found in the discipline of telenursing. Telenursing is indeed an ever expanding and beneficial method of nursing which has been used successfully in other economies with aging populations. Telenursing has been applied as a complimentary beneficial and cost saving means through which nursing care can be provided to patients at home, to compliment the conventional nursing method in the hospital.
The research into the discipline of telenursing has indicated a great amount of promising, rapidly expanding and highly beneficial means of providing nursing care. However the expansion of the method of nursing calls for greater and exhaustive volumes of research to be conducted in this area, the allocation of funds towards this should be considered to enable this research. In regards to hip fractures and its causative risks, a detailed research into a more specific design of intervention using telenursing is required for the rehabilitation care of hip fracture patients at home, so that patients can have a better access to this emerging health care method. The abundant possibilities of telenursing have been explored and suggested but more clinical experiments are required to set these possibilities in the solid foundations of scientific evidence.
List of references


Sharpe, C. C 2001, Telenursing: Nursing Practice in Cyberspace, Greenwood Publishing Group, United States of America.


Appendix

Appendix 1: List of reviewed articles

<table>
<thead>
<tr>
<th>Authors and Year of Publication</th>
<th>Title of the Article</th>
<th>Publication</th>
<th>Purpose of the Study</th>
<th>Method of Data Collection</th>
<th>Key Findings to the Study</th>
<th>Issue Related to the Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dickson, L, Cameron, C, Hawker, G, Rastansi, A, Radziunas, I, Bansod, V &amp; Jaglal, S (2008)</td>
<td>Development of Multidisciplinary Osteoporosis Telehealth Program</td>
<td>Telemedicine and e-Health</td>
<td>To determine whether a multidisciplinary approach using Telehealth is viable and if it would improve access to osteoporosis care in particular investigation and management</td>
<td>A clinical protocol was designed and tested on osteoporosis patients. The patient’s opinions were gathered via interviews and surveys.</td>
<td>1. 92% reported they would use the service again and recommend to friends and family. 2. 90% stated that they improved their knowledge of osteoporosis 3. 83% were comfortable with discussing health problems via telecommunications technology.</td>
<td>-Improve access to health specialist through telehealth (Telenursing) and home care</td>
</tr>
<tr>
<td>Goodwin, S (2007)</td>
<td>Telephone Nursing: An Emerging Practice</td>
<td>Nursing Leadership</td>
<td>To make the reader aware of the history and present use of telenursing</td>
<td>Review Article</td>
<td>N/A</td>
<td>Emergence of Tele-nursing</td>
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<tr>
<td>Authors and Year of Publication</td>
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</table>
| Greenberg, M. E (2000)          | Telephone Nursing: Evidence of Client and Organisational Benefits | Nursing Economics | Determine the outcomes of a established Telenursing service | Outcome analysis using patient surveys and information gathered from Telenursing nurses | 1. Patients provided positive comments about the level of nursing care.  
2. The service was being used often by the patients it was designed for.  
3. First time callers reported being satisfied with the service after one call  
4. Technical and interpersonal components of the service were satisfactory  
5. Clinic was projected to save $116,328 annually | -Patient satisfaction In Telenursing |
| Hagan, L, Morin, D & Le’pine, R (2000) | Evaluation of Telenursing Outcomes: Satisfaction, Self-Care Practices and Cost Savings | Public Health Nursing | Measure and determine the accessibility, quality and outcomes of nurse’s interventions of a established Telenursing | Qualitative Survey | 1. A large proportion of patients were highly satisfied with the service  
2. Patients followed the advice given by nurses  
3. Nurse’s advice | Evaluating the telenursing outcomes |
service enabled patients to resolve their issue if it was to arise again. 4. Patients were willing to use the service again.

<table>
<thead>
<tr>
<th>Authors and Year of Publication</th>
<th>Title of the Article</th>
<th>Publication</th>
<th>Purpose of the Study</th>
<th>Method of Data Collection</th>
<th>Key Findings to the Study</th>
<th>Issue Related to the Study</th>
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<tr>
<td>Jerant, A. F, Azari, R, Martinez, C, Nesbitt, T (2003)</td>
<td>A Randomized Trial of Tele-nursing to Reduce Hospitalization for Heart Failure: Patient Centered Outcomes and Nursing Indicators</td>
<td>Home Healthcare Services Quarterly</td>
<td>To determine which of three home nursing methods including Telenursing are most effective</td>
<td>Quantitative study comparing 3 models of home nursing</td>
<td>1. Visits via usual care were 3 times longer. 2. Greater than 80% reduction in hospital readmissions using Telenursing programs.</td>
<td>Success of Telenursing in the care of other conditions</td>
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<td>Johnstone, B, Wheeler, L, Deuser, J &amp; Sousa, K. H (2000)</td>
<td>Outcomes of the Kasier Permanent Tele-Home Health Research Project</td>
<td>Archives of Family Medicine</td>
<td>Evaluate the use of remote video technology in the home health care setting as well as the quality, use, patient, satisfaction and cost savings</td>
<td>Quasi-experimental study which compared a control group and an intervention group</td>
<td>1. Use of remote video technology in the home environment was less expensive than conventional care 2. Quality of care when using the intervention model was maintained</td>
<td>Video technology in homecare</td>
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<td>Juby, A. G &amp; De Geus-Wenceslau (2001)</td>
<td>Evaluation of Osteoporosis Treatment in Seniors after Hip Fracture</td>
<td>Osteoporosis International</td>
<td>Evaluate osteoporosis treatment methods</td>
<td>Retrospective review of patient’s medical charts once admitted to hospital and again after completing a rehabilitation program</td>
<td>1. Mortality rate was 9.3% for patients in rehabilitation. 2. 20.9% of patients in rehabilitation hospitals were diagnosed with osteoporosis after initial hip fracture.</td>
<td>Diagnosis, treatment and rehabilitative care for hip fracture patients</td>
</tr>
<tr>
<td>Naditz, A (2009)</td>
<td>Telenursing: Front-Line Applications of Telehealthcare Delivery</td>
<td>Telemedicine and e-Health</td>
<td>To educate the reader on the use of Tele-nursing</td>
<td>Review Article</td>
<td>N/A</td>
<td>Telenursing and its application</td>
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