

Effect of training and health education of the nurses and caregivers on patient safety in home health care Riyadh Region KSA (2020-2023).

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Abstract— Background: There is a worldwide increase in the need for Home Health Care (HHC) programs because of the increase in chronic and acute diseases that need continuous monitoring. However, many challenges hinder HHC affecting patient's outcome, and educational programs were suggested to overcome these challenges and to improve patient's outcome. Hence, this study was designed as an interventional study to assess patient's outcome after implementing an educational program for nurses, caregivers, and patients. **Materials and methods:** A quasi-experimental with pre and post-intervention observation of patient registered in home health care in the Riyadh Region was conducted. An educational program was implementing involving nurses, caregivers, and patients, and the outcome was assessed every 3 months in terms of patient's safety, fall risk and incidence. **Results:** The study included 350 patients who were followed up for 30 months, majority (83.4%) aged 65 years or older, and females predominated 244 (69.7%). Significant improvement was achieved in reduction in bedridden patients, fall risk and incidence. **Conclusion:** In conclusion the study found that implementing such an educational program for nurses, caregivers, and patients under home health care resulted in significant improvement in terms of patient's safety, fall risk and incidence.

Key Word: Home health care, Patient safety, Health education, Nurse, Caregivers.

1. Introduction

1.1. Background:

Home health care refers to a system of medical treatment delivered by trained professionals to patients in their homes while under the supervision of a doctor. Nursing care, physical, occupational, and speech therapy, as well as medical social services, are all included in home health care services (Ellenbecker et al., 2008).

Home health care services aim to improve function and independence, to support the client's optimal level of wellbeing, and to support the patient in staying at home rather than being sent to a hospital or long-term care facility. Home health care services can be sought by patients or family members, or they might be recommended by doctors (Shaughnessy et al., 2002).

Worldwide, the need for such Health Home Care (HHC) programs has grown due to the rise in acute and chronic illnesses that require ongoing monitoring, as well as the aging of the population, with approximately 70.5% of HHC patients being 65 years of age or older (Han et al., 2013).

Family members who serve as "informal caregivers" are typically responsible for providing long-term care for elderly unwell patients. A family member typically provides this care, managing the patient's care and devoting the majority of their week to it. This person is referred to as the primary caregiver (Sciences, Engineering and and 2016). Caregiving includes anything from giving the care recipient direct attention to administering social service systems and sophisticated health care. Women are more often the main caregivers (Ferrara et al., 2008; Adelman et al., 2014).

Regarding factors affecting the outcome of HCC, it is generally acknowledged that encouraging and upholding a culture of safety is linked to better outcomes and a lower frequency of clinical and other errors that could harm patients. Staffing numbers, safety knowledge, training, procedures for monitoring risk, and reporting bad incidents are all factors that contribute to a healthy safety culture (Modak et al., 2007; Horn et al., 2010; Shekelle et al., 2011; Bangova, 2013; Morris Thompson and Marks-Maran, 2015).

While delivering care in a variety of activities, caregivers connect with their care receivers for a sizable portion of the day. Nurses' perspectives on this encounter are constrained. The duration of caregiving for a person with chronic care needs can range from a brief period of post-acute care, particularly following a hospitalization, to more than 40 years (Donelan et al., 2002).

According to prior studies, home care is hindered by difficulties with patient care, nurses' skill gaps, bad management, inadequate infrastructure, cultural barriers, payment models, coordination issues, a lack of inter-professional cooperation, and a lack of job satisfaction (Murashima et al., 2002; Hsu et al., 2007; Carlson et al., 2014; Shahsavari et al., 2018). Moreover, the majority of family caregivers claim to feel unprepared for their caregiving role, and 10% claim to have received training for the position (Nuckols et al., 2017; Terracciano et al., 2020).

There is cumulating evidence that training family caregivers and nurses may lessen their workload and enhance the health of elderly people (Sciences, Engineering and and, 2016).

Thus this study was conducted to emphasize the effect of training caregivers and nurses on patient safety, fall risk and incidence in home health care Riyadh Region using an objective measurement.

1.2. Justification of the Research:

Assessing the impact of the training program for medical staff members and caregiver of the patient in improving patient safety, fall risk and incidence on the outcome of implementing

such a program, and guide further development of home health care that will ensure the best patients outcome and overcome challenges encountered by medial staff and caregivers.

1.3 Objectives:

1.3.1 General Objective:

To assess the impact of training and health education of the nurses and caregivers in improving patient safety in home health care Riyadh Region (2020-2023).

1.3.2 Specific Objectives:

- To assess the fall risk among patients under home health care.
- To assess the patient safety at home.
- To assess the Unplanned Hospital Admission & Emergency visits.

2.Literature Review:

2.1. Home health care:

Home health care is growing in the United States since the 70s of the past century In Saudi Arabia, all the current HHC programs are public funded programs (Shaughnessy et al., 1994). The first HHC program was established in 1991 by the King Faisal Specialized Hospital, and was only for terminal cancer patients. Later in 1995, the Ministry of National Guard Health Affairs established its HHC program to provide home healthcare services to minimize the length of hospital stay. In 2008, the Saudi Ministry of Health started introducing the national HHC program (Almoajel et al., 2016).

This national HHC program aims to “provide health services for all those who are in need of them, wherever they may be; in an endeavor to alleviate the suffering of waiting in hospitals or moving to get the service”, and to be provided according to the best practice of the international standards and within the framework of Islamic values and traditions of the Saudi society (Almoajel et al., 2016).

The need for home healthcare programs is an increasingly becoming important common component of healthcare worldwide, as an alternative to hospitalization, owing to the growing elderly population, chronic and acute diseases that need continuous monitoring and care (Han et al., 2013).

Globally, the need for such Home Health Care (HHC) programs has increased because of the increase in chronic and acute diseases that need continuous monitoring as well as the increase in the elderly population in which about 70.5% of HHC patients are 65 years and above (Han et al., 2013).

As the result of many causes home health care is needed in KSA health care system due to Demographical Changes, More Elderly Population in Saudi Arabia, Growing elderly population ,aged over 65 projected to increase the elderly population will increase from 6% in 2005 to 12% in 2030 according to WHO, Diseases that occur more often in elderly patients increase concomitantly as the population ages, The shift of diseases form Acute/Infectious to Chronic is very apparent. Specifically Cardiovascular deaths will increase from 36.6% to 43.7% by 2030, More Chronic Diseases, Medical advances allow better

management of chronic and incurable diseases, 30% of Disabled Need Home Care, Growing Demand for Higher Quality Life, Earlier discharge of hospitalized patients, reducing the length of hospital stays & Need to free occupied beds, the desire of patients and relatives to receive care in the home and to avoid prolonged expensive hospital care particularly at the end of the patient's life is considered as an important reason for the growth in home health care and It keeps families together while helping them adjust to a new lifestyle and maintains a sense of dignity for the patient (Almoajel et al., 2016).

2.2. Home Health Care Services:

Home health care helps people remain safely at home and live as independently as possible at home during recovery from a surgery, injury or illness, managing a serious or chronic disease or dealing with multiple diagnoses (Perroca MG,2004).

It is important to understand the difference between home health care and home care services. Although home health care may include some home care services, it is medical in nature. Home care services include chores and housecleaning, whereas home health care usually involves helping someone to recover from an illness or injury. Home health care professionals are licensed practical nurses, therapists, home health aides, and other specialties. Most of them work for home health care unit of hospitals, or primary health care departments (Perroca MG,2004).

2.3 Patient safety in home health care:

Another distinctive characteristic of home health care is that clinicians provide care to each patient in a unique setting. There may be situational variables that present risks to patients that may be difficult or impossible for the clinician to eliminate. Hospitals may have environmental safety departments to monitor air quality and designers to ensure that the height of stair risers is safe. Home health care clinicians are not likely to have the training or resources to assess and ameliorate such risks to patient safety in the patient's home (Sorensen R, Braithwaite J, 2004).

Patient safety in home health care definitions contained common elements of error reduction, risk mitigation, avoidance, management and treatment of unsafe acts and management of culminations of systemic failures (Sorensen R, Braithwaite J, 2004)

Home care is the most rapidly growing segment of the healthcare system in KSA. and there is a significant knowledge gap about safety in homecare. Given the dramatic increase in the amount, acuity and complexity of health care being provided in the home and community, it is essential to develop our understanding of safety in this sector (Buckle P, Clarkson PJ, 2006).

In KSA, the demand for home and community care services has increased substantially in recent years (Buckle P, Clarkson PJ, 2006). Home care provides the necessary health supports for medically fragile children and older adults, individuals with chronic diseases, disabilities or terminal illness, enabling them to live independently in their own homes close to their loved ones, family and community (Buckle P, Clarkson PJ, 2006). This demand has grown primarily as a result of medical and technological advances, combined with health care

cost pressures leading to fewer hospital beds, as well as a movement towards earlier patient discharge.

Despite the increasing shift of medical care from hospital to home, the patient safety literature continues to focus on institutionalized settings. Although patient safety remains an important concern in hospitals, there is an urgent need to examine this issue in the unregulated home care environment. A strong research base is necessary to provide direction for evidence-informed safety initiatives in the home care sector.

Some of the emergent shifts in thinking that have taken place in the patient safety literature are pertinent to home care. There are many change processes required to create safe environments (Lang A, Edwards N, 2006), organizational culture and workplace factors affect patient safety (Buckle P, Clarkson PJ, 2006). and patients have a key role to play in their care and thus must be part of the patient safety discourse (Lang A, Edwards N, 2006).

2.4 Fall prevention:

One of the most commonly occurring adverse events reported for patients receiving professional home health care services is the need for emergency care due to injury from falls or other incidents at home. Though there is little information on fall prevention in home health care, there is significant evidence of successful fall-prevention interventions for the overall over-65 population. Evidence suggests that individualized home programs of muscle strengthening and balance retraining, complex multidisciplinary, multifactorial risk factor screening and intervention, home hazard assessment and modification, and medication review and adjusting can all reduce the incidence of falls for the general older population living in the community. However, patients in home health care are frequently older, sicker, and frailer than the typical older adult living in the community, therefore it is unknown if information learned in other contexts can be applied to home health care (Logan et al., 2010).

2.5 Unplanned hospital admission:

Unwanted outcomes of home health care include unplanned hospital admission, which is problematic for patients, care providers, and payers. Unexpected hospital stays are linked to problems, morbidity, patient and family stress, and higher expenses (Taft, Pierce and Gallo, 2005).

Evidence suggests that unexpected hospital admissions are typically brought on by an acute exacerbation of a chronic condition; these exacerbations could be avoided by being aware of risk factors, communicating with medical professionals, and maintaining close watch. Polypharmacy, length of home health care episode, development of a new problem or deteriorating primary or secondary diagnosis, wound deterioration, and falling accidents, age, and polypharmacy are risk factors linked to unnecessary hospital admissions (Hoskins et al., 1999; Flaherty et al., 2000; Alexy, Benjamin-Coleman and Brown, 2001; Madigan and Tullai-McGuinness, 2004; Fortinsky et al., 2006).

2.6 Caregiver in home health care:

Caregiver defined as the main person who provides care for the patient's daily needs. In Home Medical Care the services cannot be done if the caregiver is not available (Lindahl B, Lidén E, Lindblad B-M, 2011).

Family caregivers play an essential role in home health care services. Integrating patient families as part of the care team can result in cost savings, enhanced patient and family experience of care, improved acute disease management, enhanced continuity of care, and prevention of hospital readmissions. Increased family engagement in the development of educational materials, program design, and patient care increases patient satisfaction, decreases anxiety among patients, and in some cases, improves health outcomes. (Lang A, Edwards N, 2006).

Responsibilities Of A Caregiver include, Keeping company, conversing and emotional support, Domestic care cleaning and meal preparation, Personal Care and Hygiene, Environmental Care and Hygiene, Social Care, Planning Care and Nursing Care (Ellenbecker et al., 2008).

Challenges Faced the Caregiver include Physical Exhaustion, Mental Exhaustion, Stress Management, Social Isolation, Inadequate knowledge and skills like Managing Disease, Behavioral Problems and Inadequate health education about how to deal with his patient at home (Sorensen R, Braithwaite J, 2004, Lindahl B, Lidén E, Lindblad B-M, 2011).

2.7 Previous studies:

Bucher et al. conducted an observational study without controls. They assessed improvement in balance and gait, number of falls, and emergent care for falls or accidents. The study included 336 patients age 62 and over and at risk for falls from 1 Midwest home care agency. Fall prevention/risk reduction program: screening with Tinetti assessment, education, physical therapy intervention, and follow up were conducted. By the end of the project Emergent care for injury caused by fall or accident at home decreased from 2.58% to 1.72% within 7 months. Improvement in gait and balance scores from 15.59 to 18.43. There was no change in number of falls in home (Bucher et al., 2007).

Feldman et al. examined the effects of a home health intervention designed to standardize nursing care, strengthen nurses' support for patient self-management and yield better CHF patient outcomes. Participants were 371 Medicare CHF patients served by 205 nurses randomized to intervention and control groups in a large urban home healthcare agency (HHA). The intervention consisted of an evidence-based nursing protocol, patient self-care guide, and training to improve nurses' teaching and support skills. Outcome measures included home care, physician and emergency department (ED) use, hospital admission, condition-specific quality of life (QoL), satisfaction with home care services and survival at 90 days. The intervention was associated with a marginally significant reduction in the volume of skilled nursing visits ($p = .074$), and a reduction variation in the typical number of visits provided ($p < .05$), without a significant increase in physician or ED use or patient mortality (Feldman et al., 2004).

3. Materials and Methods:

3.1 Study Design:

The study implemented a quasi-experimental pre and post-intervention observation of patient registered in home health care in the Riyadh Region.

3.2 Study Area:

Riyadh is the thriving capital at the heart of the modern Kingdom of Saudi Arabia (Saudi Arabia, 2008).

The name Riyadh is derived from the Arabic word meaning a place of gardens and trees. It lies in the Central Region called Najd, on a sedimentary plateau 600 meters above sea level. It was called Al-Yamamah in the past. With many wadis in the vicinity, Riyadh has been since antiquity a fertile area set in the heartland of the Arabian Peninsula (About Riyadh, 2017).

3.3 Study duration:

The study was conducted during thirty months from 2020 to 2023.

3.4 Study population:

The respondents in this study 350 patient and care giver registered in home health care in the Riyadh Region. Also respondents in this study were sixty (60) nurses working at home health care, Ministry of Health, Kingdom of Saudi Arabia.

3.5 Sample size:

The study included 350 patients however, the minimum sample size required was estimated using the following Slovin's Formula equation:

$$n = N/(1+Ne^2)$$

Where;

n is the sample size.

N is the population size.

e is the margin of error to be decided by the researcher.

N is estimated number (2000).(from hospitals data)

e margin of error (0.05)

$$n=333$$

The sample size was estimated as 350.

3.6 Data Collection Method and Tools:

Data was collected from the patient medical record using specific form of assessment pre and post intervention including:

Patient assessment:

This form was created on the link below to be reviewed with each visit and for easy extraction of data from it.

https://docs.google.com/forms/d/e/1FAIpQLSfgCX3lyvUq0Ern_cw4kR5hT0JCzE7W8UKdyNTCPDTWm0XxHA/viewform?vc=0&c=0&w=1.

Missouri forms for fall risk assessment.

Home Safety Assessment form.

(All this forms selected by researcher to use in research and approved by home health care administration).

3.7 Data analysis:

Data was cleaned and entered into Microsoft excel data sheet and analyzed using SPSS version 28 software. Categorical data was represented in the form of frequencies and proportions. Continuous data was represented as mean and standard deviation. One sample T test was used as test of significance.

Microsoft Excel and word were used to obtain various types of graphs such as bar diagram. P value (Probability that the result is true) of <0.05 was considered as statistically significant after assuming all the rules of statistical tests and level of confidence. Data was represented after analysis in form of uni-variable tables, cross tabulation (bi variable tables), figures and narrative illustration.

4. Results

The study included 350 patients who were followed up for 30 months, majority (83.4%) aged 65 years or older, and females predominated 244 (69.7%); male to female ratio was 1: 2.3 (table 1).

Patients at risk to fall started to decrease after one year from 250 (71.4%) to 222 (63.4%) with 8% reduction (p-value 0.014) (table 2 and figure 1). while the incidence of fall started to decrease in the first three months from 16 (4.5%) to 0 falls in the last six month of the study (p-value 0.001) (table 2 and figure 2).

Hospital admissions were reduced from 43 (12.2%) to 6 (1.7%) throughout the study; 10.5% reduction (p-value <0.001) (table 2 and figure 3).

Table 1: Characteristics of patients under home healthcare in Riyadh, Saudi Arabia (n=350).

	Frequency (%)
Age	
20-65	58 (16.6%)
65 and above	292 (83.4%)
Gender	
Male	104 (30.3%)
Female	244 (69.7%)

Table2: Outcome of patients under home healthcare in Riyadh, Saudi Arabia (n=350).

Parameter	Mean± SD	First	Last	Difference	Significance
Fall risk	239± 11	250	222	-28	0.014
Fall	7.4± 5.6	16	0	-16	0.001
Admission	27.3± 12.5	43	6	-37	<0.001

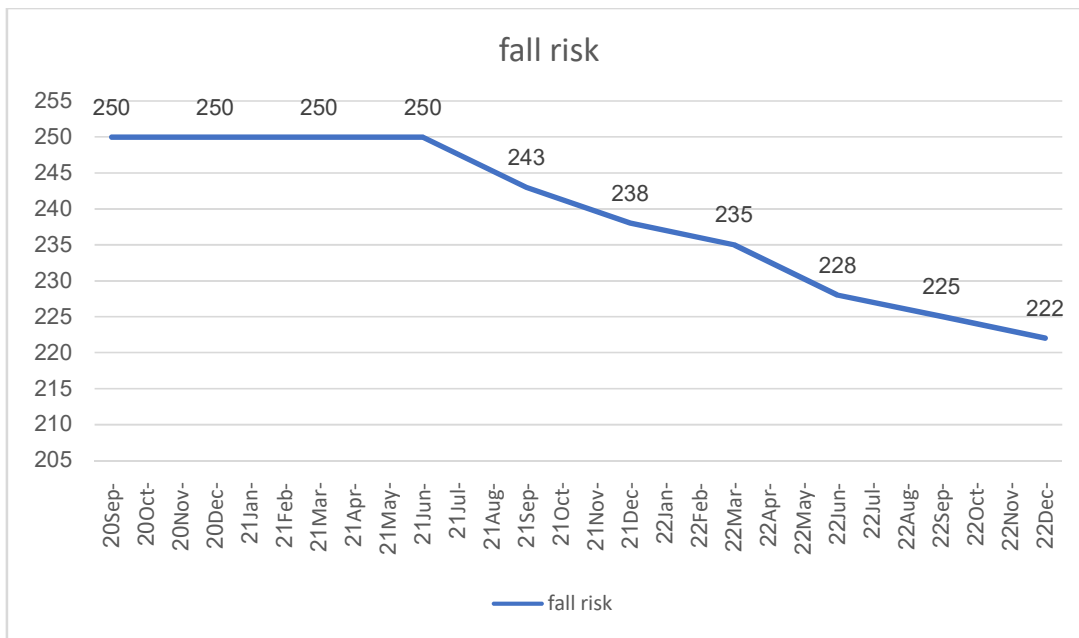


Figure1: Fall risk among patients under home healthcare in Riyadh, Saudi Arabia (n=350).

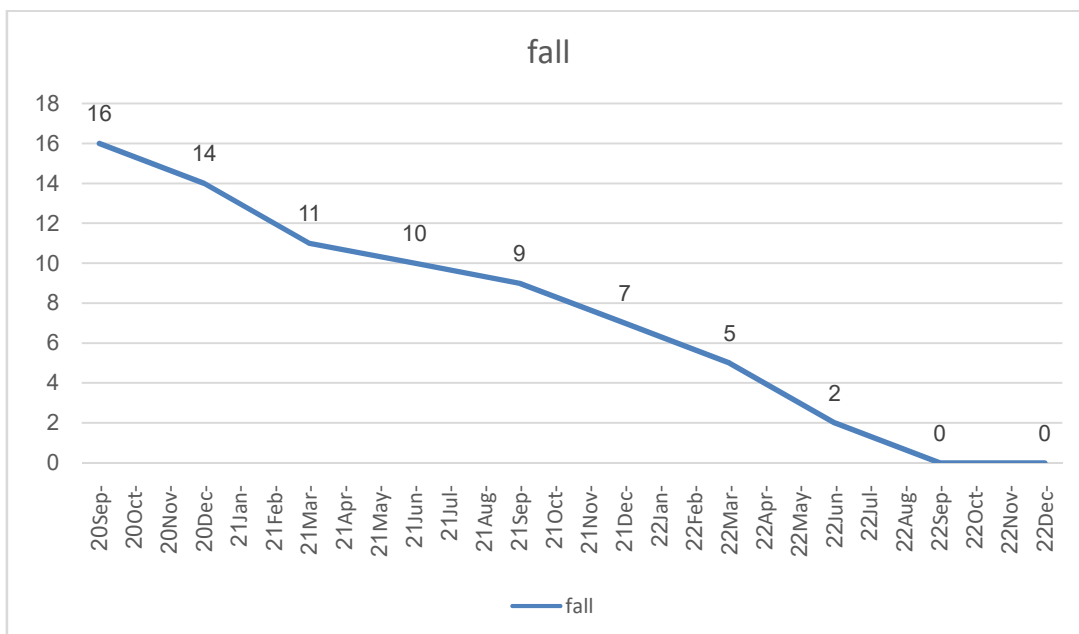


Figure2: Incidence of falling in patients under home healthcare in Riyadh, Saudi Arabia (n=350).

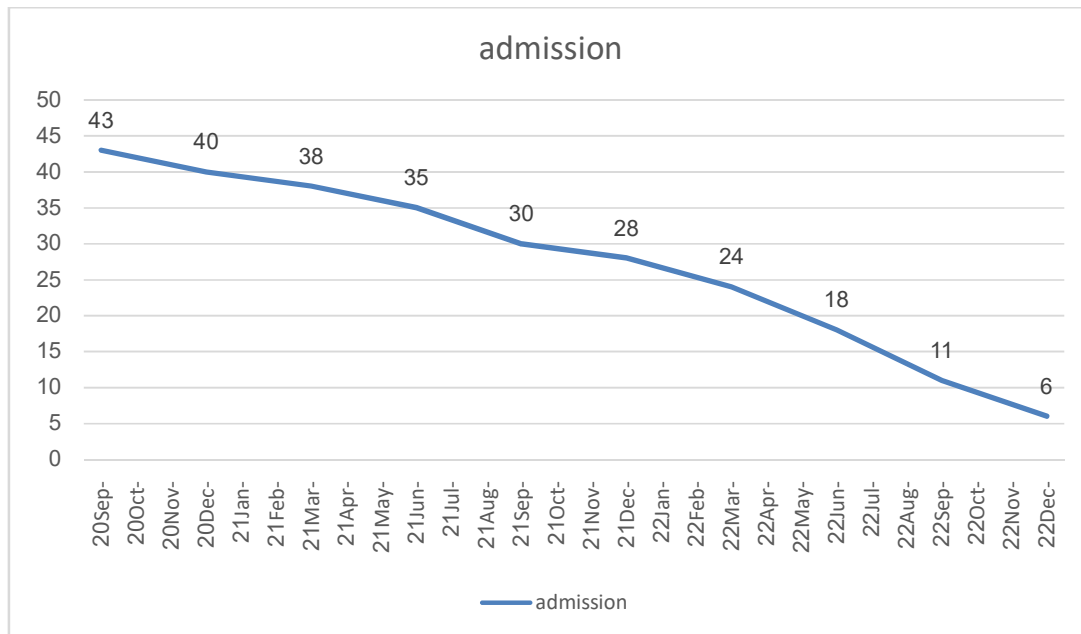


Figure 3: Hospital admission among patients under home healthcare in Riyadh, Saudi Arabia (n=350).

5. Discussion:

There is a worldwide increase in the need for Home Health Care (HHC) programs because of the increase in chronic and acute diseases that need continuous monitoring as well as the increase in the elderly population in which about 70.5% of HHC patients are 65 years and above (Han et al., 2013). However, many challenges hinder HHC affecting patient's outcome, and educational programs were suggested to overcome these challenges and to improve patient's outcome. Hence, this study was designed as an interventional study to assess patient's outcome after implementing an educational program for nurses, caregivers, and patients.

The study included 350 patients who were followed up for 30 months, majority (83.4%) aged 65 years or older, and females predominated 244 (69.7%), The study assessed the outcomes in terms of patient's safety, fall risk and incidence, bedsores risk and incidence and hospital admission.

In this study both fall risk and incidence of fall were reduced after the intervention; patients at risk were reduced from 71.4% to 63.4% with 8% reduction, while the incidence of fall decreased 4.5% to 0 falls in the last six month of the study. Although Bucher et al. reported no significant change in the incidence of fall at home, Emergent care for injury caused by fall or accident at home decreased from 2.58% to 1.72% within 7 months (Bucher et al., 2007).

This indicate a good quality intervention that was translated to reduction in both risk and incidence of fall unlike Bucher et al. study.

The intervention also resulted in reduction of hospital admissions from 12.2% to 1.7% throughout the study; by 10.5%. this similar to what Sturkey et al. reported in their study as the hospital visits among patients under home care reduced from 1.83% to 1.09% after the educational intervention (Sturkey et al., 2005). Although in both this study and Sturkey et al. study the proportion of patients under home care who needed hospital admission were similar, this study showed greater reduction that emphasizes on the potential of such an educational program in improving patient's outcomes. This is supported by Feldman et al. reported that the typical number of hospital visits was reduced in their study despite that utilization of nurses and physicians were not significantly changed (Feldman et al., 2004).

Conclusion:

Home health care services seek to provide high quality, safe care in ways that honor patient autonomy and accommodate the individual characteristics of each patient's home and family. Falls, declining functional abilities, pressure ulcers and non-healing wounds, and adverse events related to medication administration all have the potential to result in unplanned hospital admissions. Such hospitalizations undermine the achievement of important home health care goals: keeping patients at home and promoting optimal well-being.

In conclusion the study found that implementing such an educational program for nurses, caregivers, and patients under home health care resulted in significant improvement in terms of patient's safety.

Recommendations:

The findings of this study are promising, such a program should be adopted by the health authorities to be implemented on a wider range.

Continuing training courses for nurses to become more professional and improve their skills and knowledge about home health care.

Conducting similar research on a wider scale to determine the impact of training and health education of the nurses and caregivers on patient safety.

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