

The Incidence And Associated Factors Of Home Health Care Patients On Admission, Readmission & Amp; Emergency Department Visit

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Abstract

Background:

A form of care known as home healthcare (HHC) is delivered at home by medical personnel under a doctor's supervision. HHC is offered in Saudi Arabia in accordance with international norms and within the parameters of Islamic social mores and customs. Reducing hospitalizations and emergency service use has been the main objective of HHC services. However, there is insufficient knowledge regarding the hospital and emergency service admission rates of HHC patients.

Aim:

To investigate the incidence of hospital admissions, readmissions, and emergency department visits among home health care patients at King Abdullah Medical City.

Methods:

This was a retrospective cohort study conducted among adult patients receiving HHC services by HHC-King Abdullah Medical City in Makkah, Saudi Arabia, between January 2022 and December 2022. Patient data were obtained from the health information system, including HHC patients' data for 2022.

Results:

A total of 977 patients were enrolled, with a mean±SD age of 68.39±14.47. Females represented 60.4% of the patients. The rates of hospital and emergency admissions were 29.2% and 45%, respectively, and unplanned visits accounted for 62.6%. The primary diagnosis of the patients was cardiac disease (27.9%), and the main reason for admission was pain in 11.7%. An unplanned admission was significantly associated with the duration between the hospital visit and the last HHC visit (P=0.0001).

Conclusion:

The admission rate for HHC patients in the emergency department was high, with a high prevalence of unplanned visits. Such unplanned visits were linked with longer duration since the last HHC visit. HHC patients with chronic diseases tended to visit HHC.

Keywords: Incidence, Factors, Admission, Causes.

Introduction:

Healthcare services are increasingly being delivered in homes due to ageing, shorter hospital stays, the need for continued care after discharge, technological advances, and new insurance reimbursement arrangements [1]. Home care services are implemented in accordance with regional regulations, and there are two strategies available based on the complexity, intensity, and duration of the care intervention. The first strategy involves nurses or family practitioners caring for patients at their home, performing clinical consultations or simple technical procedures on a set schedule. In contrast, the second model is integrated home care, which provides a range of professional services in response to medium- to high-complexity medical, rehabilitation, and/or nursing and social health needs [2].

Home healthcare (HHC) is care provided at home by healthcare professionals under physician direction. This type of care encompasses nursing care, physical therapy, home healthcare aides, medical social services, speech therapy, and occupational therapy [1]. HHC services support the management of complex medical conditions and daily living activities while keeping patients in a familiar setting [3].

In Saudi Arabia, the HHC program was established in 1991 at King Faisal Specialized Hospital and Research Centre for patients with terminal cancer. In 2008, the program was established by the Saudi Ministry of Health, with the primary goal of providing health services to all patients who require them, wherever they are, and alleviating the suffering of waiting in hospitals or of moving to obtain them [4]. HHC services are provided in accordance with international standards and within the framework of Islamic values and societal traditions [4].

The use of emergency services is more common among older patients than among younger patients [5]. Also, older patients are more likely to stay longer in the emergency department than younger patients [6]. Therefore, HHC and nursing services were established to reduce hospital admissions and workloads [7]. The most crucial goal of HHC service has been to reduce emergency services and hospitalization [7].

The demand for HHC services by older patients with severe conditions and comorbidities has elevated considerably; however, the question of whether this service could actually reduce the rates of hospital and emergency admissions [8]. Furthermore, the scientific evidence regarding the association between HHC and emergency service usage is insufficient [9]. Therefore, this study was established to investigate the incidence of hospital admissions, readmissions, and emergency department visits among home health care patients at King Abdullah Medical City, particularly given the lack of Saudi studies on the HHC service subject.

Subjects and methods:

Design, subjects, and settings:

This was a retrospective cohort study conducted among adult patients receiving Home Health Care (HHC) services from HHC-King Abdullah Medical City in Makkah, Saudi Arabia, between January 2022 and December 2022. The included patients were those who received home healthcare in 2022, including those referred from inpatient and outpatient settings, and those with a hospital admission or emergency department visit episode, whereas those who didn't fulfil the previous criteria were excluded.

Data collection and procedure:

Patient data were obtained from the health information system, including HHC patients' data for 2022. The list of patients was distributed to research data collectors without nominative information; they were identified by study code and initials. This was linked to the patient's name and MRN in a separate identification log sheet, which was kept in a safe, locked place. The search was conducted patient by patient to determine whether each patient had a hospital visit (admission or ER) in 2022; therefore, additional data were collected as previously mentioned. The collected data were entered and saved in an Excel sheet, including demographics, clinical data, and admission information.

Statistical analysis:

Data were analysed using the Statistical Package for the Social Sciences software (IBM SPSS Statistics 25). Categorical variables were presented as frequencies and percentages, while continuous variables were presented as the mean \pm standard deviation (SD). The chi-square test was used to detect any significant associations between categorical variables. The independent samples t-test was used to compare the differences in mean values of normal and non-normal variables. Significance was set at $P < .05$.

Results:

The final sample included 977 patients. Table 1 displays the sociodemographic and health characteristics of the sample at the start of care.

The most common diagnosis group was chronic diseases (74.5%; $n=728$). Cardiac disease, Neurological disease, and Cancer were the most common discharge diagnoses in (27.9%; $n=273$), (27.8%; $n=272$), (27.6%; $n=270$), respectively. Other syndromes were recorded less frequently. Skin disease as a main diagnosis was recorded only in two patients. (Table 2). Table 2 also shows the reasons for hospital visits. The specific reason was pain, and we mean any pain other than chest pain (11.7%; $n=114$). Other common reasons for hospitalization were respiratory problems (SOB, pneumonia, Abnormalities of breathing, ASTHMA, respiratory failure), Gastrointestinal problems/symptoms (nausea, vomiting, diarrhea, constipation, decreased oral intake, intestinal obstruction, Acute cholecystitis, Anorexia), renal/urinary tract problem/symptoms (UTI, retention, dysuria, Hematuria, Acute kidney failure, chronic renal failure, urine retention), and mental abnormal symptoms (confusion, decreased LOC, dizziness, vertigo). Table 3 shows the outcomes for the gender and admissions. There were no significant differences in these outcomes. The majority of inpatient admissions or ER visits were female. Table 4 shows the outcomes for the age and admissions. No significant association ($p \leq 0.05$) with any group. Also, there was no significant difference in the admission compared to the duration ($P=.98$) for both types of duration. The hospitalizations were divided into nine diagnosis groups according to their primary discharge diagnoses and thirty-four reasons for hospital visits. Most of the analyzed reasons were associated with some of the diagnosis groups in the univariate analysis. We found significant differences between some of them. Only the non-significant association ($p \leq 0.01$) was therefore excluded from the table (Table 5). We found

significant differences between the duration of the current hospital visit, the last HHC visit, and planned or unplanned visits by HHC (Table 6).

Table 1: Characteristics of those hospitalized

Variable	N (%) OR (mean ± SD)	Missing N (%)
Age (mean ± SD)	68.39 ± 14.47	-
Gender, % (n)		
Female	590 (60.4)	-
Male	387 (39.6)	
Referral from % (n)		
Inpatient	496 (50.8)	20 (2)
outpatient	461 (47.2)	
admission or ER visit % (n)		
Admission	285 (29.2)	-
ER	440 (45)	
No episode	252 (25.8)	
First admission after acceptance in HHC % (n)		
No	201 (20.6)	692 (70.8)
Yes = READMITTED)	84 (8.6)	
Planned or unplanned by HHC		
planned	109 (11.2)	256 (26.2)
unplanned	612 (62.6)	
duration between admission; date of acceptance (mean ± SD)	133.17 ± 226.76	895
(Interval) duration between current hospital visit; last HHC visit (mean ± SD)	20.90 ± 36.49	254

Values are presented as numbers (percentages) & mean ± SD

Table 2: The diagnosis and Reason for hospital visit

Variable	(n)%
Diagnosis	
Infection	34 (3.5)
Cardiac disease	273 (27.9)
Cancer	270 (27.6)
Neurological disease	272 (27.8)
Respiratory disease	111 (11.4)
Renal disease	103 (10.5)
Psychiatric disease	11 (1.1)
Skin disease	2 (.2)
Chronic disease	728 (74.5)
Reason for hospital visit % (n)	
chest pain	34 (3.5)
Pain	114 (11.7)
renal/urinary tract problem/symptoms	77 (7.9)
gastrointestinal problem/symptoms	80 (8.2)
infection	48 (4.9)
cardiac problem	40 (4.1)
respiratory problem	96 (9.8)
poor performance status	2 (.2)
mental abnormal symptoms	61 (6.2)
dehydration	1 (.1)
fatigue/ generalized weakness	20 (2)
suspected DVT	2 (.2)

accidental removal of drains/tubes/catheter	10 (1)
attention to drains, catheters, stomas, dressing, wounds, tracheostomy	14 (1.4)
acute lymphoblastic leukemia	1 (.1)
neurological problem/symptoms	34 (3.5)
elective admission for procedure/surgery	5 (.5)
allergy	2 (.2)
abnormal BP	10 (1)
burn	1 (.1)
swelling/edema	12 (1.2)
anemia	25 (2.6)
ascites	4 (.4)
shocking	1 (.1)
vascular/blood problems	17 (1.7)
electrolyte imbalance	13 (1.3)
hypo/hyperglycaemia	3 (.3)
insomnia	2 (.2)
fever	40 (4.1)
pressure ulcer	7 (.7)
cancer-related symptoms	21 (2.1)
hernia	1 (.1)
trauma	7 (.7)
dermal problem	3 (.3)

Values are presented as numbers (percentages)

Table 3: The relation between gender and admission or ER visit.

Variable	Gender		P-value
	Female 590 (60.4)	Male 387 (39.6)	
Admission			
No	407 (41.7)	285 (29.2)	.117
Yes	183 (18.7)	102 (10.4)	
ER			
No	327 (33.5)	210 (21.5)	.721
Yes	263 (26.9)	177 (18.1)	
No episode			
No	446 (45.6)	279 (28.6)	.221
Yes	144 (14.7)	108 (11.1)	

Values are presented as numbers (percentages). Statistical significance $P < .05$.

Table 4: The relation between different variables and admission or ER visit.

Variable	Admission		P-value
	No	Yes	
Age, mean \pm SD	68.82 \pm 14.8	67.35 \pm 13.4	.151
Variable	ER		P-value
	No	Yes	
Age, mean \pm SD	68.86 \pm 14.1	67.83 \pm 14.8	.268
Variable	No episode		P-value
	No	Yes	
Age, mean \pm SD	67.64 \pm 14.3	70.56 \pm 14.78	.006
	Admission		.985
	No	Yes	

duration between the current hospital visit and the last HHC visit	20.88 ± 35.54	20.94 ± 37.98	
duration between the current hospital visit and the last HHC visit	ER		.981
	No	Yes	
	20.86 ± 37.9	20.93 ± 35.5	

Values are presented as mean ± SD. Statistical significance P= < .05

Table 5: The relation between primary diagnosis and reason of hospital visit

Variable	N	%	P-value
infection * pain	8	.8	.028*
infection * fatigue/ generalized weakness	4	.4	.000*
infection * elective admission for procedure/surgery	1	.1	.043*
Cardiac disease * cardiac problem	17	1.7	.036*
Cardiac disease * respiratory problem	37	3.8	.015*
Cardiac disease * Anemia	11	1.1	.002*
cancer * pain	46	4.7	.001*
cancer * Gastrointestinal problem/symptoms	36	3.7	.000*
cancer * cardiac problem	5	.5	.029*
cancer * respiratory problem	15	1.5	.006*
cancer * fatigue/ generalized weakness	12	1.2	.001*
cancer * Anemia	13	1.3	.006*
cancer * Ascitis	4	.4	.001*
cancer * electrolyte imbalance	7	.7	.033*
cancer * cancer-related symptoms	14	1.4	.000*
neurological disease * accidental removal of drains/tubes/catheter	9	.9	.000*
neurological disease * Anemia	1	.1	.007*
neurological disease * pressure ulcer	5	.5	.010*
respiratory disease * pain	3	.3	.002*
respiratory disease * renal/urinary tract problem/symptoms	2	.2	.012*
respiratory disease * Gastrointestinal problem/symptoms	3	.3	.025*
respiratory disease * respiratory problem	30	3.1	.000*
respiratory disease * Vascular/blood problems	6	.6	.002*
respiratory disease * fever	9	.9	.023*
renal disease * cardiac problem	8	.8	.047*
renal disease * poor performance status	2	.2	.000*
renal disease * electrolyte imbalance	4	.4	.017
renal disease * fever	8	.8	.047*
skin disease * Chest pain	1	.1	.000*
Chronic disease * pain	68	7	.000*
Chronic disease * renal/urinary tract problem/symptoms	66	6.8	.019*
Chronic disease * Gastrointestinal problem/symptoms	49	.5	.004*
Chronic disease * Ascites	0	.0	.001*
Chronic disease * cancer-related symptoms	8	.8	.000*

*Statistically significant (P < 0.05). Values are presented as numbers (percentages)

Table 6: The relation between planned or unplanned by HHC and duration

Variable	Planned or unplanned by HHC		P-value
	Planned	Unplanned	
duration between admission and the date of acceptance	81.30 ± 126.6	140 ± 237.0	.444
duration between the current hospital visit and the last HHC visit	2.54 ± 5.9	24.21 ± 38.7	.000*

*Statistically significant (P < 0.05). Values are presented as numbers (percentages)

Discussion:

There is insufficient data and evidence on the impact of HHC on hospital and emergency department (ED) admission rates [8]. Also, there is no previous Saudi evidence conducted on HHC patients' admission to the hospital and the ED. Therefore, this study was established to investigate the incidence of hospital admissions, readmissions, and emergency department visits among home health care patients at King Abdullah Medical City, particularly given the lack of Saudi studies on the HHC service subject.

The majority of patients who use HHC are elderly [4]. In the current study, we found that the mean age of patients was 68.39 years, confirming that HHC is primarily used by the elderly. Additionally, it was reported that the majority of patients who benefit from HHC services are over 65 years of age [10], findings that were consistent with ours. A study from Turkey revealed that more than one-half of the HHC patients were 80 years of age or older (60.3%) and female (68.4%) [1]. Similarly, we found that female patients represented more than one-half of the sample, and their proportion (60.4%) was similar to the previous Turkish study [1].

One study included 8590 geriatric patients to compare those who received HHC with those who didn't. It was found that only 10.1% received HHC, and they significantly tended to have higher rates of comorbidities and longer hospital stay compared to those who didn't receive HHC [11]. In this study, we focused only on HHC patients and didn't compare them with any other patient population. We found that the hospital admission rate was 29.2% and ER admission was much higher (45%). However, as we didn't compare such findings with the admissions of other patients, we are unable to determine the impact of HHC on admission rate.

Additionally, most of those who receive HHC have single or multiple chronic illnesses such as endocrine and metabolic diseases, heart and circulatory system disorders, diabetes, musculoskeletal and connective tissue diseases, as well as immune disorders [12]. This was typical of our findings, as we found that most of the patients (74.5%) had chronic diseases, which mainly included cardiac diseases (27.9%) and cancer (27.6%). One study from Turkey discovered that cardiovascular (82.9%) and neuropsychiatric (76.3%) diseases were the most common comorbidities among HHC patients [1]. Similarly, we found that neurological diseases represented a significant proportion of complaints of the patients (27.8%); however, psychiatric illness was prevalent among a very small proportion of the patients (1.1%).

In Finland, the assessment of diagnosis for home care clients' unplanned hospital admission revealed that the most common diagnoses of patients included infectious diseases (21.2%), cardiovascular diseases (13.3%), and injuries (11.4%) [13]. These findings contrast with ours, as infection was among the least common diagnoses, whereas cardiovascular diseases were among the most common. This variation in findings may be related to the variation in healthcare settings and admissions, as well as the predominance of specific complications in each population.

One study focused on nursing home patients revealed that the most common reasons for admission were infection (40%), falls and fractures (19%), cardiac causes (8%), gastrointestinal complaints (7%), and stroke or transient ischemic attack (7%) [14]. In this study, we found that

the reasons for hospital visits were highly variable, with 35 distinct reasons; the most common were pain (11.7%), respiratory (9.8%), gastrointestinal (8.2%), and renal (7.9%) problems.

In Sweden, one study assessed factors related to ED visits among nursing home residents and found that ED visits were higher among those living in urban areas [15]. This factor wasn't assessed in our study; however, hospital and ER admissions weren't varied by patient gender. Furthermore, the admission rates weren't varied by other variables, including age and the duration between the current hospital visit and the last HHC visit.

The present research revealed that unplanned visits represented more than one-half of the visits (62.6%). Unplanned visits were significantly linked with longer duration between the current hospital visit and the last HHC visit ($P=0.0001$). Other factors related to unplanned visits were investigated in a previous study; based on a previous retrospective chart review from Taiwan, it was found that the predictors of unplanned emergency visits, included Charlson Comorbidity Index (OR 1.33), male caregiver (OR 0.18), and number of emergency department (ED) utilizations within previous past year before enrollment (OR1.54), whereas duration of introducing homecare services (OR 0.97), and working experience of dedicated nurses (OR0.89) were predictors of reduced unplanned ED visits [9]. However, we didn't investigate other variables that may be related to unplanned HHC visits.

Conclusion:

This study revealed that HHC patients tended to be older. Also, the admission rate of HHC patients was high for the emergency department, followed by hospital admission, with a high prevalence of unplanned visits. Such unplanned visits were linked with longer duration since the last HHC visit. HHC patients with chronic diseases tended to visit HHC due to various reasons, mainly related to pain, respiratory, gastrointestinal, and renal problems.

Limitations, strengths, and recommendations:

The limitations of this study include the retrospective design and the fact that patients receiving home healthcare who didn't register any admissions or ER visits may be admitted or visit another healthcare facility, which in turn may affect the sample size. However, the main strength of this study is that it is the first Saudi study to focus on the current research, and it is also one of the few global studies to examine hospital and emergency service admissions among HHC patients. Therefore, further studies are highly recommended.

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