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ASSOCIATION BETWEEN THE ORGANIZATION AND ENVIRONMENTAL FACTORS AND WORK INJURIES AMONG HOME HEALTH CARE NURSES

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Abstract

Work-related injuries have an adverse impact on health and safety of the employees, patients, and health care organization. Nurses' exposure to work injuries is one of the highest rates in home and community care institutions. Nurses working in home health care (HHC) encounter multidimensional risk factors, including the organizational and environmental hazards associated with HHC. The purpose of this cross-sectional study was to examine the relationship between the organization and environmental factors and the work injuries (WIs) as experienced by HHC nurses (HHCNs). A prediction of the significant factors related to work injuries was explored. A self-reported data was obtained from 74 nurses working in nine HHC units in the Makkah Region, KS, using the Safety Home Care Nursing (SHCN) questionnaire. The results

showed that the supervisory support (SS) ($\beta = -0.36, p = .009$) and the access to a client's home (AC) ($\beta = -0.25, p = 0.05$) were negatively affecting the WIs as experience by HHCNs. This implies that the training of Front-line supervisors and HHC providers in safety management and safety communication would improve competence in effective implementation of safety practices. This study suggests to ensure a safe HHC through the execution of an integrative approach involving managers, nurses, and other practitioners, as well as the patients' and their informal caregivers.

Keywords

Home Health Care, Work Related Injuries, Organizational Safety Factors, Workplace Safety

1. Introduction

According to WHO (2016), over 59 million health care workers experienced injuries in the workplace. Between 2004 and 2013, UK surveillance revealed that 81% of doctors, nurses, and health care assistants suffered from workplace injuries (Owusu et al., 2014). Work related injuries were associated with financial problems, including the burden of medical care expenses, productivity losses, and disability pensions (Badun 2017). Workers with work injuries (WIs) experienced adverse effects related to social relationship, self image, and higher exposure of stress and depression (Chin et al., 2018; Ramos, Carlo, Grant, Trinidad, Correa, 2016). Despite the advent of safety regulations and measures intended to protect health care workers, nursing has experienced the highest incidence rate of nonfatal workplace-related injuries, accounting for 13.7 per 100 workers (Gomaa et al., 2015).

1.1 Background

Workplace safety is a global concern that has been investigated in community health settings, including the HHC industry (Huang et al., 2014; Polivka et al., 2015). HHC workers are particularly vulnerable to workplace risks as they experience an unpredictable and largely unregulated environment in community home settings (Geroshan, 2012). According to Quinn et al. (2016), nearly 30% of public health nurses encountered workplace violence. Shibuya (2012) found that 35.7% of HHC nurses (HHCNs) experienced at least one sharp injury and one third of home health aides suffered from musculoskeletal injuries (Fute, Mengesha, Wakgari, & Tessema, 2015). From these and other studies, it can be inferred, that HHC providers (HHCPs) encounter tangible threats to their safety when delivering home-based health care

services. Despite the contextual threats associated with home care, the emerging risks are preventable and manageable (Gershon et al., 2012; Leiss, 2014).

The safety issues associated with HHC are attributable to several factors: a) increased complexity of home care; b) the nature of HHC jobs; and c) characteristics of the home care environment (Lang et al., 2015; Leiss, 2014; Polivka et al., 2015). HHC is surrounded by multiple risk factors, such as physical, interpersonal, and psychosocial factors (Craven, Byrne, Sims-Gould, & Martin-Matthews, 2012). Evidences from safety researchers suggested that these risk factors can be effectively managed, thus promoting workplace safety (Richter, McAlearney, & Pennell, 2016; Salminen, Gyekye, & Ojajarvi, 2013). With regards the safety management, organizational support is positively affecting the employee behaviors (Nadim, Hassan, Abbas, Naveed, & 2016). In particular, supervisor support, teamwork, and safety communication were essential components in creating a safety centric organization. Several environmental factors associated with home care were considered threats to safety: geographical location, working in isolation, and inadequate transitional care (Terry, Le, Nguyen, & Hoang, 2015). Further studies concluded that the physical and psychosocial conditions associated with a client's home, as well as the characteristic of informal caregivers can contribute to unsafe HHC (Jones, 2015; Lang et al., 2015). Failure to emphasize workplace safety in the HHC setting could inadvertently contribute to occurrences of workplace injuries (Abubakar, Karadal, Bayighomog, Merdan, 2018).

1.2 Home health care in Saudi Arabia

In the Kingdom of Saudi Arabia (KSA), there has been a growing demand of HHC programs over the past decade. Between 2012 and 2015, the number of home care services adopted by the Ministry of Health hospitals increased from 163 HHC services caring for 12,729 beneficiaries to 209 HHC services caring for 27,764 beneficiaries (MOH 2012; MOH, 2015). This 28.2% increase in the HHC services, in the Saudi society, was attributed to the rapid growth of clients diagnosed with diabetes, hypertension, renal failure, and stroke. This resulted in high occupancy rates, in acute care facilities, by clients with chronic diseases who were in need tertiary level prevention in the form of long-term care and rehabilitative services. The number of HHC workers increased from 1,295 to 1,691 between 2012 and 2015 (MOH, 2012; MOH, 2015). The manifested expansion of HHC services and increasing manpower precipitated the need for safety strategies to protect HHCNs and promote positive health outcomes for clients.

After all, a failure to adequately address the safety concerns and needs of the HHCNs can jeopardize the quality of care clients receive.

Previous studies on HHC, in Saudi Arabia, focused on examining the perceptions of home care recipients and informal caregivers (ICGs) and the effect of home care on hospital readmissions, length of stay (LOS), and emergency visits (Aljameely, 2011; Al-Khashan, Mishriky, Selim, El Sheikh, & BinSaeed, 2011; Hafiz, Fahmy, Ibrahim, & Saleh, 2014). There has been a scant amount of research focusing on workplace safety in home health care and particularly when it comes to examining the linkages between nursing and safety. Furthermore, the published studies provide insufficient information in terms of examining the view of nurses on HHC safety (Balize et al., 2012; Miller, 2013). This represents a legitimate gap in the existing literature. To address this gap, our study focused on identifying the environmental factors (EFs) and organizational factors (OFs) associated with HHC and their relationship with WIs amongst HHCNs. Given the critical role nurses play on the HHC team, the perceived safety of nurses delivering home and community based care can only be measured by eliciting the opinions of HHCNs.

1.3 Research Questions and Hypotheses

RQ1: Is there a relationship between organizational-related factors associated with home healthcare and work injuries experienced by HHCNs?

H_01 : There is no significant relationship between the perceived organizational factors and work injuries experienced by HHCNs.

H_a1 : There is a significant relationship between the perceived organizational factors and work injuries experienced by HHCNs.

RQ2: Is there a relationship between the environmental related factors, associated with home healthcare and work injuries experienced by HHCNs?

H_02 : There is no significant relationship between the perceived environment factors associated with home healthcare and work injuries experienced by HHCNs.

H_a2 : There is a significant relationship between the perceived environment factors associated with home healthcare and work injuries experienced by HHCNs.

2. Methods

This study utilized a cross-sectional study design to examine the relationship between the OFs (management commitment, supervisory support), EFs (access to a client's home, home

condition, home-based care), and WIs as experience by HHCNs employed at governmental hospitals in the Makkah Region, KSA. The strength and direction of the relationship between the independent variables (management commitment, supervisory support, an access to a patient's home, home condition, home based care) and WIs as the dependent variable were explored. Amongst all factors, the significant predictors of WIs were identified. In this study, the PRECEDE components of the Precede-Proceed model was used as an organizing framework. The PRECEDE construct; the social, epidemiological, organizational, and environmental phases were used for determining a wide range of factors related to the measurement of the HHC safety (Phillips, Rolley, & Davidson, 2012; Tramm, McCarthy, & Yates, 2012).

2.1 Study Population and Sampling

The sample size was determined based on a power analysis with the following parameters: probability level (0.80), number of predictors (3), effect size ($p \leq .01$ or $.05$), and statistical power (80%) (Cohen, 1988; Cohen, Cohen, West, & Aiken, 2003). Based on the previous assumptions, the anticipated sample size was 113 participants if $(r) = .26$, and 10 participants if $(r) = .79$ as revealed by the sample size of regression table (StatsToDo, 2016). As a result, the sample size was calculated to be not less than 62 HHCNs. In this study, data were obtained from 74 HHCNs from nine HHC units in the Makkah Region. Participants who have worked in HHC and were involved in home care visits in the prior 12 months were included in the study. Nurses in supervisory positions were excluded from the study as they are directly responsible for leading and managing their employees. To verify that all participants met the inclusion criteria, nurses also responded to the question "Have you been involved in home visits in the last 12 months?." A nurse who answered "no", was excluded from the study, while a nurse who answered "yes" was included.

2.2 Validation of the Study Instrument

A self-reported survey was conducted using the Safety Home Care Nursing (SHCN) questionnaire. The SHCN questionnaire is comprised of three components, including the demographic data and two structured scales related to organizational and environmental factors. The demographic data gathered the personal characteristics of the participants, including the number of non-fatal physical work related injuries in the prior 12 months as experienced by HHCNs. The organizational and environmental items were structured using a 5-point Likert scale to measure the degree of safety perceived by HHCNs. The organization scale items were derived from a reliable and valid scale used in the previous studies with several modifications to

suit this study as permitted by the authors (Lu & Tsai, 2010). Because there was not a published validated and reliable environmental scale (ES), the developed current ES was subjected to face and content validity with the assistance of a distinguished panel subject matter experts (SME). The panel consisted of six participants, holding doctorates and possessing an accomplished background in the field of safety, HHC, and community health. The members were fluent in Arabic and English.

To further ensure validity of the ES, the scale assessment passed through several rounds using an approach codified by Zlateva et al. (2015). In the initial round, the ES (English version) was developed based on the literature review (Larsson, Karlqvist, Westerberg, & Gard, 2013; Leiss, 2014; Polivka et al., 2015) and was assessed for overall relevancy, essentiality, redundancy, and clarity. Followed by the second round where the panel assessed the ES for its appropriateness (inappropriate or appropriate) in relation to relevancy, clarity, and redundancy. In the third round, the SHCN questionnaire (Arabic version) was assessed for translation validity to ensure that the scales of the Arabic and the English version were reflecting similar meanings as understood by participants. Based on the feedback from the panel, suggested modifications and corrections were made to the SHCN questionnaire.

The questionnaire was pilot tested with 7 HHCNs working in government own HHC units, with the express purpose of identifying any problems with clarity and readability of the questionnaire items and instructions. As a result, a few changes to the measurement scale were made. For example, the definition of supervisor was added; the term “rickety” changed to “damaged”; and the question concerning the WIs changed to “During the past 12 months, how many physical injuries have you had during working time, such as: sharp injuries, falls, trauma, backache, and others.” Finally, the internal consistency of the SHCN scales was assessed by applying Cronbach’s alpha (α). An alpha score of 0.70 and more was considered a good reliability (Lu & Tsai, 2010). According to Fugas, Silva, & Meliác, (2012), a Cronbach’s alpha (α) of 0.60 is acceptable for an exploratory scale. The Cronbach’s alpha (α) of each scale of the SHCN was computed and presented in Table 2.1. The mean Cronbach’s alpha (α) for the SHCN instrument is ($\alpha = .74$).



Table 1: Overall Reliability Cronbach's alpha of the SHCN questionnaire (n = 74)

Variable	Number of items	Reliability (α)	Mean (α)
Organization Factors			
Management commitment	4	0.74	0.74
Supervisory support	6	0.89	
Environmental Factors			
Access to a patient's home	2	0.62	
Home condition	4	0.66	
Home-based care	8	0.79	

3. Results

3.1 Data Analysis and Findings

Data were analyzed using SPSS version 21. A descriptive analysis, including frequencies, percentage, means, and standard deviations were used to describe the demographic characteristics of HHCNs (Table 3.1). The target sample of nurses working in HHC units was 89. Seventy nine (79) questionnaires were returned and 5 were rejected due to incomplete data, yielding in a response rate of 83.15%. Out of 74 nurses, 38 (51.4%) were females. The mean age of the participant was 35.1 with *SD* 7.52. Seventy seven percent (77%) of the nurses were between the ages of 20-40. Nearly seventy six percent (75.7%) of the participants were of Saudi decent and 67.7% had attended safety training in the prior 12 months. With regard to spoke languages, 74.3% could speak both English and Arabic and only 5 (6.80%) nurses lacked fluency in Arabic. With respect to the frequency of physical, non-fatal WIs experienced by HHCNs, Table 3.2 illustrates that 42 (56.76 %) of the HHCNs experienced nonfatal physical injuries during work time in the last 12 months. Of these, 30 nurses (40.5%) sustained one or two WIs and 12 nurses (16.2%) experienced 3 and more injuries (see Table 3.2).

Table 2: Demographic Characteristics of the Participants (n = 74)

Variables	Frequencies	%	Mean	<i>SD</i>
Age				
20-30	27	36.5	35.16	7.52
31-40	30	40.5		
41-50	16	21.6		
51-60	1	1.40		
Gender				
F	38	51.40		
M	36	48.60		



Nationality			
Saudi	56	75.70	
Non-Saudi	18	24.3	
Safety Training			
Y	50	67.7	
N	24	32.4	
Language			
Arabic	14	18.9	
English	5	6.80	
Both	55	74.3	

Table 3: Number of Injuries Experienced by HHCNs (n= 74)

Number of Injuries	Frequencies	%
No injuries	32	43.2
1–2 injuries	30	40.5
3–4 injuries	6	8.1
> 4 injuries	6	8.1

With regard to participants' responses to safety items on the SHCN questionnaire, a study of Ooshaksaraie and Azadehdel (2014) revealed that mean scores of 3.0 and higher were perceived as a safe work experience, while the scores less than 3 were viewed as an unsafe work experience with regard to organizational and environmental factors. Accordingly, the results displayed in Table 3.3 reflect that HHCNs perceived organizational factors, such as management commitment and supervisory support, as fostering workplace safety ($M = 3.37$, $SD = .82$); however, environmental factors were viewed as contributors to a less safe HHC environment ($M = 3.13$, $SD = 0.50$). Moreover, nurses reported experiencing unsafe situations when accessing patient homes (AC) ($M = 2.94$, $SD = 0.61$) and running across poor home conditions (HC) ($M = 2.93$, $SD = 0.58$). The nurses` experienced safe home-based care (HB) ($M = 3.53$, $SD = 0.71$).

Table 4: Means (M) and Standard Deviations (SD) of All Variables

Variable	M	SD	Overall M	SD
Organization Factors				
Management commitment	3.31	0.94		
Supervisory support	3.43	0.93	3.37	0.82
Environmental Factors				
Access to a patient's home	2.94	0.61		
Home condition	2.93	0.58		
Home-based care	3.53	0.71	3.13	0.50

To determine the nature and strength of the correlation among the variables, this study used the Cohen's (1988) conventions of effect size (r). Cohen's model suggested a strong positive correlation when a correlation coefficient is ≥ 0.50 , a moderate positive linear correlation when a correlation coefficient is $r \geq 0.30 < 0.50$, and a weak positive linear association when the correlation coefficient is $r \geq 0.10 < 0.30$. Table 3.4 shows the correlation between the organizational and environmental factors used for measurement of HHC workplace safety. According to Cohen's model, there was a strong positive correlation between MC and SS, which was statistically significant ($r = 0.54, n = 74, p < .001$). There was a statistically significant and moderately strong positive correlation between MC and HB ($r = 0.32, n = 74, p = .005$) and SS and HB ($r = 0.37, p = .001$). This indicates when MC increases, SS and HB correspondingly increase.

Table 5: Correlation Between the organization and environmental factors

Variable	MC	SS	AC	HC	HB
Management commitment (MC)	1				
Supervisory support (SS)	0.54***	1			
Access to a patient's home (AC)	0.13	0.08	1		
Home condition (HC)	0.15	0.19	0.40***	1	
Home-based care (HB)	0.32**	0.37***	0.36**	0.79***	1

*** $p < .001$, ** $p < .01$

3.2 Relationship Between the OFs and EFs and the WIs

A correlation coefficient (r) analysis was applied to quantify the direction and strength of the relationship between the OFs (MC, SS) and EFs (AC, HC, HB), and the WIs. A linear regression (LR) model was applied to identify which factors (MC, SS, AC, HC, HB) are significant predictors of WIs. According to the results in Table 3.5, SS is significantly moderate and inversely correlated with WIs ($r = -0.30, n = 74, p = .005$), indicating those HHCNs with higher scores of SS tend to have a less WIs. A LR analysis was performed to predict which OFs (MC, SS) were significant in relation to WIs. The multiple regression model with the MC and SS predictors produced $R^2 = 0.1, R^2_{Adj} = .07, F(2, 71) = 3.86, p < .03$, which was an overall significant result. The coefficient results indicated the MC factor did not significantly predict the value of WIs ($\beta = .12, p = .394$), however, the SS factor did significantly predict the WIs ($\beta = -.36, p = .009$). Therefore, the alternative hypothesis that stated there is a significant relationship

between OFs and WIs was accepted and the null hypothesis was rejected, hence, the SS, as a component of OFs, has a significant effect on WIs.

Table 6: Correlation and Regression Between work injuries and Organization Factors

Variable	<i>r with WIs</i>	<i>R</i> ²	<i>Adj R</i> ²	<i>b</i>	β	<i>t</i>	<i>sig</i>	95% Confidence	
								Lower	Upper
		.09	.07						
Management commitment	-0.08			0.11	0.12	0.86	0.39	-.147	.368
Supervisory support	-0.3**			-0.35	-.36**	-2.69	0.01	-.608	-.090

** $p < .01$

Table 3.6 shows the results of correlation and regression analysis of the EFs (AC, HC, HB) and the WIs. There was a weak negative correlation between the AC factor and WIs, which was statistically significant ($r = -0.26, n = 74, p = .01$). In other words, when safe access to patient homes increase, there is a significant decrease in the frequency in WIs. The LR model with the AC, HC, and HB predictors produced $R^2 = 0.8, R^2_{Adj} = .04, F(3, 70) = 1.95, p = .13$. Amongst all EFs, only AC was found to be a significant predictor of WIs ($\beta = -.25, p = .05$). Based on the results, we partially failed to reject the null hypothesis that stated there is no significant relationship between EFs and WIs. Conversely, we partially accepted the alternative hypothesis, since the AC predictor had a statistically significant influence on the WIs, while the HC ($\beta = -.17, p = .38$) and HB ($\beta = .16, p = .40$) reported no effect.

Table 7: Correlation and Regression Between Work Injuries and Environment Factors

Variables	<i>r with WIs</i>	<i>R</i> ²	<i>Adj R</i> ²	<i>b</i>	β	<i>t</i>	<i>sig</i>	95% Confidence Interval	
								Lower	Upper
		.08	.04						
Access to a patient 's home (AC)	-0.26**			-0.34	-0.25	-1.96*	0.05	-.682	.007
Home condition (HC)	-0.14			-0.24	-0.17	-.88	0.38	-.766	.294
Home based care (HB)	-0.07			0.77	0.16	-0.84	0.40	-.380	.934

** $p < .01, * p < .05$

4. Discussion

This study revealed that the HHCNs perceived a safe work experience when taking into consideration the organizational and environmental factors. Despite these findings, more than half of HHCNs experienced non-fatal work related injuries. However, amongst all safety factors,

the supervisory support (SS) and access to a patient's home (AC) were negatively affecting nurses' exposure to WIs. Those nurses who experienced support from their direct supervisor were less likely to sustain WIs. Despite the work environment has no significant influence working attitude as concluded by Yousuf, Omolayo, and Azikiwe (2015), the current result is consistent with the safety studies of Liu et al. (2015), who found SS is negatively associated with WIs. In our study, supervisory support was characterized as engaging in safety communication with subordinates; enforcing safety procedures; and taking appropriate action to correct safety concerns. Our findings affirm the crucial role that supervisors play in safety management within HHC units, in the Makkah region, KSA. HHC supervisors need to be prepared to engage in supportive communication that promotes a culture of safety among HHCNs. Moreover, the interpersonal relationship between the supervisor and HHCNs needs to foster collaboration in the identification of safety threats and trends, and then take appropriate measures to mitigate the risks and lessen the likelihood of WIs. Romiko and Jumpamool (2016) confirm the need for the Frontline manager to effectively support the staffs' development

With respect to EFs, access to a patient's home (AC) has a strong effect on WIs among HHCNs. Nurses experienced safety concerns and or WIs during home visits resulting from the geographic location of the home and its' condition. Consistent with our finding, Terry et al. (2015) found similar risks to health care workers when investigating the hazards associated with accessing a client's home. Terry et al. (2015) recommended conducting home assessments prior to the initial HHC visit. The anticipated action of the HHC team is to assess the physical and psychosocial aspects of the patient's home and the informal caregivers (family and friends). This provides HHCNs the information necessary to more effectively judge the potential dangers that could result in WIs. Armed with this understanding, HHCNs can more aptly determine whether or not client care can be safely delivered in the home or if other alternatives need to be explored. As HHC continues to proliferate in the Kingdom of Saudia Arabia, HHC units need to consider the multidimensional nature of work related injuries. Understanding the situational threats and sharing this information with patients' and their families will heighten sensitivity to safety concerns and spur a collaborative effort to enhance workplace safety for HHCNs and thus improve the quality of care clients receive.

5. Conclusion

This study identified organizational and environmental safety factors that significantly reduce work related injuries among HHC nurses. It was discovered that supportive supervision results in a reduction in the instances of work related injuries amongst HHCNs. Conversely, home health care nurses were more likely to experience work related injuries when access to a patient's home is considered unsafe in terms of its' geographical location and physical condition. The results of this study have potentially positive implications for practice and society. First, home health supervisors need formal training on how to create a culture that promotes safety by fostering two-way communication; identifying safety concerns; and then working with home health care nurses to mitigate safety hazards. Second, empower home health care nurses to take the lead on efforts to identify and resolve safety concerns that might otherwise result in work injuries. Third, provide patient's and their families with information about home-based safety concerns, and then collaboratively work with these stakeholders to resolve the identified dangers. Fourth, society is positively impacted when home health care nurses are able to safely deliver high quality health services without fear of sustaining a work related injury. This allows clients to receive the home and community-based care necessary to improve their health status. To ensure a safe workplace in home health care, it takes an integrative approach involving home health care managers and leaders, nurses, and other practitioners, as well as the patients' and their informal caregivers.

This study illuminates the safety experience of HHCNs working in the Makkah region, KSA. We focused on the contextual aspects of safety within the home health care sector, which had not been previously investigated. There was little prior research focusing on workplace safety concerns in HHC, within the Kingdom of Saudia Arabia. This made it challenging to form a solid foundation based on prior obtained knowledge on the subject, but it did establish a legitimate gap in the existing literature for which this study looked to address. This said, the present study has a few limitations that should be noted when considering its findings and that can be addressed in future research. The first concerns a longitudinal effect. The data were collected from surveys administered to home health care nurses over a relatively brief period of time. It is possible that the perceptions of these nurses may have changed with the passage of time. At this juncture, we cannot discern an intervening event of sufficient impact to have substantially changed the nurses perceptions of workplace safety in the home health care environment. That being said, our findings are broadly compatible with previous findings from

studies conducted outside the Kingdom of Saudi Arabia, and lends weight to our confidence in the validity of our findings. Although the random sampling is less bias and the result can be generalized to a larger population, the researcher had constraint to access to participants in the other HHC program in other cities because of the distance and unavailability of transportation facilities. In addition, the results could have been affected by a self-reported survey where the participants had to recall past experiences concerning work related injuries sustained within the prior 12 months. As a result, we recommend that a longitudinal study be undertaken to measure workplace safety and risk factors beyond a one year period. In addition, it is suggested that a more rigorous assessment of the environmental scale's validity be conducted.

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