

## ORIGINAL ARTICLE

# TESTING THE EFFECTIVENESS OF INTEGRATED ELDERLY CARE MODEL ON QUALITY OF CARE AND HEALTH OUTCOMES AMONG HOSPITALIZED ELDERLIES IN WEST BANK

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## ABSTRACT

*The rapid increase in the ageing population and health conditions are imposing a higher challenge to the health care system that requires multidisciplinary teamwork utilizing coordinated care approach. This study examined the effects of integrated care model on quality of care received by older hospitalized patients in West Bank. A quantitative interrupted time series design (pretest and posttest multiple time series, quasi-experiment design) was used. The study examined the effects of integrated care model on admitted older patients (n=32) in the West Bank measuring ten dimensions of quality of care and four health indicators. There was a significant improvement in the dimensions of quality of care: dimensions: nurses' communications with patients, physicians' communications with patients, staff response to patients' needs, pain management, explanations on medications, amount of information given on discharge plan, patients' area cleanliness, patients' area quietness, rating of the hospital, and willingness to recommend the hospital. Incidence of falls and incidence of pressure ulcer improved after implementing the model, while readmission rate and average length of stay did not improve. This study contributed to the limited body of knowledge related to the effect of integrated care model on hospitalized older patients' quality of care in Palestine/ West Bank. Integrated care has the potential to improve care outcomes among hospitalized older patients.*

**Keywords:** Elderlies, Elderly care, Quality of care, Health Care Outcomes, Integrated Elderly Care, West Bank

## INTRODUCTION

The number of older people is rapidly increasing worldwide<sup>1</sup>. According to the National Institutes of Health, older population who are 65 years and above represents 8.5% of the total population worldwide and grows at an unprecedented rate<sup>2</sup>. This percentage is expected to be around 20% by 2050<sup>3</sup>. In Palestine and particularly in the West Bank, older people ( $\geq 65$  years) forms 4.4% of the total population. Moreover, life expectancy has increased from 67 years in 1992 to 71 years in 2012<sup>4</sup>. It is expected that the required medical services needed for the future frail and ill older population will increase demands on healthcare systems<sup>5</sup>. This demographic transition has accelerated the ageing process of population in the region resulting in more pressure on health care systems<sup>6</sup>. Significant numbers of older people with chronic illnesses has been reported; nevertheless, health care system in Palestine is still focusing on managing acute cases rather than chronic ones<sup>7</sup>. This would result in additional burden and risks on the health systems such as health care services, economy, legislation,

politics and support services. Underserving chronic illness among elderlies might jeopardize their health status leading for longer length of stay and more comorbidities<sup>6</sup>.

It is critical to consider the psychological impact of hospitalization on older patients<sup>8</sup>. Health conditions of older patients are more complicated due to loss of functionality and autonomy<sup>9</sup>. This required an advanced model of care rather than depending only on traditional care plans to respond to complexity of health condition of older patients<sup>10-13</sup>. The literature emphasized the need to bring together the elements of a healthcare agency that were formerly separate to achieve common goals and optimal results<sup>14</sup>. The integrated model of care for older hospitalized patients is proposed to alleviate these problems and to enhance the continuity of health care plan<sup>15-16</sup>, to improve the quality of care, and increase older patients' satisfaction<sup>17</sup>. Integrated model of care found to improved older patients' perception of quality of care<sup>18</sup>, standardize care activities and care plans<sup>19</sup>, organize communication among healthcare

providers, and cause less hospital acquired injuries<sup>20</sup>. On the other hand, other studies found that lack of an integrated care plans negatively affected the quality of care outcome among older patients<sup>21</sup>. Testing such model of care in the West Bank were limited resources and barriers to access and utilization of care, especially older persons, are clearly observed will enable improving quality of care provided. Therefore, The purpose of this study was to examine the impact of implementing of an integrated model of elderly care for hospitalized older patients on their quality of care in West Bank.

## METHODS

**Study Setting and sample selection:** The study was conducted at an elderly care unit in a specialized hospital in Jerusalem/Wes Bank. This hospital was selected because it is the only hospital that has elderly care unit which corresponds with the research question and the integrated care model in this study. The inclusion criterion included: all inpatients who are 65 years old and older, receiving medical care (admitted) at the elderly department. No exclusion criteria have been used. The total number of patients recruited was 32.

**Design:** Effectiveness of the integrated care model was evaluated using a quasi-experimental design (pre-test, multiple post-tests). Perceived hospital care was measured at four points of time. Perceived hospital care was measured at four points of time, first time before implementing the model and three times after. Baseline measurement (T0) was obtained prior to the intervention. Follow-up measurements were obtained after one month(T1), two months(T2), and three months (T3) of implementing the model. Data on health indicators were collected on two occasions, (T0) and (T3). Data were obtained on each indicator for the past three months each time.

**Sample and Setting:** study was conducted at an elderly care unit in a specialized hospital in Jerusalem/Palestine. This hospital has been selected because it is the only hospital that has elderly care unit which correspond with the research question and the integrated care model in this study. Data collected started on January to April . 2019. The sample recruited in this study formed of older patients admitted to elderly care unit. All patients who were 65 years old and above and admitted to the targeted unit were approached and recruited. The total number of patients recruited was 32.

### Intervention

The intervention implemented in this study was an integrated model of care designed on the PRISMA

(Program of Research to Integrate the Services for the Maintenance of Autonomy) model of care<sup>22</sup>. The PRISMA is an innovative model created to improve continuity and increase the efficacy of healthcare services, especially for older and disabled populations in Canada<sup>22</sup>. The PRISMA tools include: 1) coordination between decision-makers and managers, 2) case management process, 3) single entry point, 4) individualized service plans, 5) single assessment instrument, and 6) computerized clinical chart for communicating between institutions<sup>22</sup>. The primary investigator coordinated all care provision and periodically evaluated throughout the study to ensure consistent and effective implementation of the model.

### Ethical considerations

An ethical approval was obtained from the Scientific Research Committee of the targeted institution. All patients and or their first degree-relatives were approached by the investigator with presence of facilitator at the unit to introduce the study. The participants were offered a cover letter that provided information on study purpose, significance of the study, assurance of confidentiality, assurance that data would be treated confidentially, and contact information for the principal investigator. A written informed consent was obtained from older patients. Illiterate patients got help from a first degree-relative before signing the consent.

### Data Collection

Patients were offered a paper-and-pencil self-report questionnaire to collect data on their demographic characteristics and how they perceived the hospital care provided at the unit. Illiterate patients provided their data through structured interview with the investigator. Patients were asked to rate the received care at three intervals; after one month, two months, and three months of implementing the model. Data on health care indicators were obtained from the statistics department at the targeted hospital.

### Study Instrument

The study questionnaire comprised of three sections:

1. Patients' demographic profile was assessed by collecting information regarding gender, residency area, education level, marital status, and whether having family member accompany them at hospital.

2. The Arabic version of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scale measured the quality of provided care as perceived by the patients after implementing the integrated care model<sup>24</sup>. The HCAHPS is a standardized instrument and has been in use since 2006 to measure patients' perspectives

of hospital care. The HCAHPS Survey consists of 27 items which measure ten domains: communication with nurses, communication with doctors, pain management, responsiveness of hospital staff, cleanliness of hospital environment, quietness of hospital environment, discharge information, communication about medicines, overall rating of the hospital, and willingness to recommend the hospital<sup>25</sup>. The literature showed evidence of reliability and validity of the original HCAHPS instrument. The reliability scores of HCAHPS domains were tested and the least alpha level from all domains was 0.71<sup>26</sup>. The Arabic version of HCAHPS demonstrated good internal consistency reliability with an overall Cronbach's  $\alpha$  is 0.90 and good internal consistency across the separate domains with a Cronbach's  $\alpha$  ranged from 0.70 to 0.97<sup>24</sup>.

3. Health indicators measured in this study were: 1) incidence of falls (2) incidence of developing pressure ulcer, 3) average length of stay (number of nights from admission till discharge), and 4) number of readmissions (number of episodes when a patient who has been discharged from a hospital is admitted again for the same diagnosis

within 30 days from discharge). Information on these four indicators was obtained from the statistics department of the hospital twice, once at baseline and again after three months.

#### Statistical analysis

The computer program Statistical Package for the Social Sciences (IBM-SPSS) software, version 24 was used to analyze the collected data. Central tendency measures (Mean and median) and dispersion measures (SD and Range) used to describe the variables. The repeated measure ANOVA was used to test the HCAHPS domains. The assumptions of repeated ANOVA have been tested for normality, independence, singularity, and linearity. Paired t-test and repeated ANOVA test was used to compare the health indicators at the baseline and postintervention.

## RESULTS

#### Patients' demographic characteristics

Patients had a mean (SD) age of 73.7 (5.07) years ranged from 66 to 81, 62.5% were males, 43.8% lived in a city, 75.5% were married, and 71.8% lived with a family (Table 1).

**Table 1: Patients' demographic characteristics (n=32)**

Variables	n	%	
Gender	Male	20	62.5
	Female	12	37.5
Residency area	City	14	43.8
	Town	5	15.6
	Village	9	28.1
	Camp	4	12.5
Level of education	Primary school	12	37.5
	Secondary school	5	15.6
	College and above	15	46.9
Marital status	Single	3	9.4
	Married	24	75.5
	Widow	5	15.6
Live with family	Yes	23	71.8
	No	9	28.1

#### Quality of care

The primary research question has been answered by conducting repeated ANOVA test. Repeated ANOVA test was performed on the data obtained by HCAHPS survey from (T0), (T1), (T2), and (T3) measurements. Analysis of the HCAHPS survey (Table 2) showed that the mean scores on the ten domains have been significantly increased after three months of implementing the integrated care model. The increment in the mean score varies among the domains; however, remained statistically significant ( $p < .05$ ). The largest improvement was in "nurses' communication with patients" while the least improvement was in "information on discharge plan".

Table 2: Analysis of HCAHPS domains before and after implementing care model (n=32)

Domains	T0		T1		T2		T3		Δ *	M	F	P
	M	SD	M	SD	M	SD	M	SD				
Nurses' communication with patients	6.28	2.33	7.22	1.35	8.61	1.35	11.1	.98	4.82	4361.4	< .001	
Physicians' communication with patients	6.61	2.24	7.77	1.66	8.22	1.20	11.00	1.04	4.39	3318.8	< .001	
Staff response to patients' needs	4.05	1.57	4.78	0.69	5.83	0.57	6.75	0.86	2.7	388.3	< .001	
Pain management	4.22	1.23	5.16	0.71	6.40	0.84	7.50	0.52	3.28	1080.0	< .001	
Explanations on medications	4.66	0.88	4.66	0.88	6.40	0.84	7.36	0.92	2.7	1157.6	< .001	
Information on discharge plan	2.38	1.05	2.45	0.72	2.48	0.72	3.00	0.95	0.62	1211.7	< .001	
Patients' area cleanliness	1.67	0.70	2.35	0.48	2.7	0.44	3.65	0.48	1.98	2178.2	< .001	
Patients' area quietness	1.78	0.79	2.35	0.48	2.77	0.42	3.65	0.48	1.78	1874.3	< .001	
Rating of the hospital	3.40	2.06	5.38	0.71	5.93	0.67	8.31	0.64	4.91	2878.2	< .001	
Willingness to recommend the hospital	1.78	0.87	2.58	0.50	3.16	0.45	3.93	0.24	2.15	2938.2	< .001	

\* Note: Δ M= M (T3)-M(T0)

Table 3: Health indicators before and after implementing the model (n=32)

Health indicators	T0		T3		MD	SD	t-test	p
	Before		After					
	M	SD	M	SD				
Incidence of fall	5.33	1.52	1.33	1.52	4.00	2.64	9.38	0.00
Incidences of pressure ulcers	3.00	2.64	0.33	0.57	2.66	2.88	6.82	0.04
Average length of stay	132	1.73	128	1.15	3.33	1.52	3.78	.063
Number of re-admissions	1.66	0.57	1.33	0.57	0.33	0.57	1.00	.423

MD: Difference in Mean

**Health indicators**

Analysis of improvement on health indicators was performed by conducting paired t-test to compare mean differences between (T0) and (T3), before and after implementing the integrated care model (Table 3). The analysis showed a statistically significant decrease in incidence of fall from 5.33 to 1.33 ( $t=9.38, p< .001$ ) and incidences of pressure ulcers from 3 to 0.33 ( $t=6.82, p< .05$ ). The mean (SD) incidence of fall after the intervention was 1.33 (1.52), which was less than that before the intervention 5.33 (1.52). The incidences of pressure ulcers after the intervention was 0.33 (0.57), which was less than that before the intervention 3.0 (2.64). On the other hand, the analysis showed no statistically significant differences in average length of stay ( $t=3.78, p=.063$ ) and number of re-admissions ( $t=1.00, p= .423$ ).

**DISCUSSION**

Caring of older patients is becoming one component of quality outcomes of healthcare facilities. Efforts have been made to improve the quality of care provided to hospitalized older patient; therefore,

this study tested the integrated elderly care model as one novel option for such need. This study investigated the effect of integrated care model built on PRISMA model on the older patients in Palestine/West Bank. Overall, this study found that integrated care has improved the provided quality of care and health indicators. There was an improvement in all domains of quality of care from (T0) to (T3) in the current study, and some domains started to improve from the first month. Although the initial effect of the intervention was somehow low, the difference was obvious after (T3). This pattern of improvement was also reported in the literature. This finding is consistent with previous reports investigated the effect of integrated care plans among older patients<sup>26-27</sup>. The findings of this study also provided confirmation of one of the major aims of integrated care in which using the integrated care will improve quality of care and reaching better healthcare outcomes<sup>28</sup>. Moreover, the findings emphasized the long-term effect of the integrated model which has been also a concern in the literature where sustainability of quality of care was a requirement for any proposed interventions<sup>29</sup>. It worth to mention, here, that although the

improvement was not equal among all quality domains, the improvement was statistically significant ( $p < .05$ ) among all domains. The increment in the mean score varies among the ten domains. Variation in improvement among the ten domains might arise from the notion that older patients might not have the knowledge and ability to evaluate all dimensions of care. Older patients evaluated the care provided depending on their knowledge and experience and upon their health conditions that might have caused some variations. Variation can also be explained by difference in the level of acceptance and commitment of health care professionals to implement the model among and differences related to their professional skills and authorities related to their job assignments<sup>30</sup>.

#### **Communication with nurses and physicians**

The notable improvement was “nurses’ communication with patients” followed by “physicians’ communication with patients”. This finding is in line with a previous study which found that communication with nurses and physicians was the most important predictors of patient satisfaction for hospitalized older patients<sup>18</sup>. Moreover, another study found that patients asserted that communication and skills of health care providers are more important than other aspects of patients’ satisfaction<sup>31</sup>. Older patients also considered communication with healthcare team as a salient aspect of quality of care that they have received at the hospital<sup>31</sup>. This infers that older patients do emphasize dignity and respect as the core values that are seeking to from their interpersonal interaction and relationship with healthcare providers. A recent systematic review reached to a conclusion that communication between older patients and healthcare providers and development of interpersonal care relationship was identified as one of the core elements among older patients<sup>32</sup>. This supports the finding of the current study and gives an important value for the role of integrated care to improve the communication and quality of care provided. This study also showed that improvement in nurses’ communication was greater and earlier than improvement in doctors’ communication in this study. Similar finding was noticed in a previous study<sup>32</sup>. This could be explained by the fact that nurses are more frequently interact with older patients than other health care professionals.

#### **Pain management**

Pain management was improved after implementing the integrated care model. Improvement in pain management was better in the first and second month than third month. Decline in the effect of the model in the third month may infer the importance of sustainability of the model and variation in pain management modalities. A previous study stressed

on the continuous coaching and support for the health care providers during the time of implementing the integrated model of care<sup>24</sup>. Integrated care implies that healthcare provider should focus on the unmet needs and dynamic needs of the patients through regular monitoring and evaluation of pain level and response to pain therapy.

#### **Discharge information**

Regarding the discharge information domain, improvement started at the third month. It was part of the physicians’ job to prepare the discharge plan for the patients. Late improvement in the discharge information might have happened because it took longer time for the physicians to believe in the effect of the model in comparison with other healthcare providers in the unit. This would also explain the early improvement in the “Explanations on medications” since it was part of nurses’ job. Nurses’ compliance to implement the integrated model was more obvious than physicians did in this study. However, improvement of discharge information due to integrated model of care was also reported from other studies. For example, Janse and colleagues found that integrated model of care improves the patients’ knowledge about their health status; their care plan and their health statuses post discharge<sup>33</sup>.

#### **Cleanliness and quietness**

Patients’ satisfaction about hospital cleanliness and quietness has been improved significantly and immediately after implementing the integrated care model from the first month.

Cleanliness and quietness of patient room were found as significant influential attributes to patients’ satisfaction<sup>34</sup>. A previous study investigated the effect of PRISMA care model reached to similar conclusion on the effect of integrated model to improve the patients’ area in terms of quietness and cleanliness<sup>27</sup>.

#### **Overall rating and willingness to recommend the hospital**

Rating of the hospital and willingness to recommend the hospital both were improved after implementing the integrated model comparing to baseline data. Improvement on these two domains was continuous all over the study duration. This finding extends existing literature on the effect of integrated healthcare service on the willingness of older patients to rate and recommend the care agencies<sup>24</sup>.

#### **Health indicators**

Falls among older people is common and may result in considerable mortality and morbidity<sup>35</sup>. Pressure ulcers among older people may result in earlier mortality in comparison with similar patients

without pressure ulcers<sup>35</sup>. The older patients exhibit a group of physical conditions that make them vulnerable to develop pressure ulcer<sup>32</sup>. Immobility, malnutrition, dehydration and lack of hygiene are possible risk factors for development of pressure ulcer among hospitalized older patients<sup>37</sup>. The current study found a positive effect for the integrated care model on both incidences of fall and incidence of pressure ulcer. Incidence of fall and pressure ulcer improved from the first month in the current study. Implementing the integrated care model might enable the patients to gain more autonomy and decreased their fatigue and pain, which in turn decreased their fall incidence. This finding is consistent with previous studies that addressed the effect of integrated care and fall preventive measures to reduce fall incidence among patients<sup>37</sup>. Interdisciplinary care approach applied in this study have decreased the fall incidence. A previous study found that interdisciplinary care team resulted in decreased fall rates and better patients' safety in general<sup>38</sup>.

Implementing of integrated model of care in the current study decreased incidence of pressure ulcer. This improvement could be linked to continuous assessment, taking preventive measures, coordination among healthcare providers, and individualized discharge plan which all were possible through implementing the integrated care model in the current study. A previous study has also found that continuity of care and proper discharge plan improved the incidence of pressure ulcer among hospitalized older patients<sup>39</sup>. The incidence of fall and pressure ulcer improved from the first month after implementation the integrated model. A possible reason for this is that both indicators are sensitive to the improvement in the physical and mental status as a result for implementing the integrated care model. Improvement of fall and pressure ulcer incidence was found correlated with improvement of physical and mental status of the older patients<sup>39</sup>.

Both indicators: length of stay and readmission rate are common indicators to evaluate hospital performance and assumed to relate to quality of care<sup>40</sup>. Length of stay is a correlated indicator with quality of hospital performance<sup>41</sup>. The current study found that implementing the integrated model of care did not lead to significant improvement in length of stay and readmission rate within the context of the participants.

This study has some limitations. First, the concept of quality of care is multidimensional; therefore, it is not plausible to claim causality between the improvement in patients care and the integrated care model.

## CONCLUSION

This study could partially answer the question "how to improve the quality of care provided to hospitalized older patients". The study findings, in general, emphasized the role of integrated care to improve the quality of care provided to older hospitalized patients and improving health care outcomes. The results in general indicated that the integrated care model can be beneficial for hospitalized older patients in Palestine/Westbank in terms of improving their quality of care and may serve as a basis to promote evidence-based practice. Further studies will show if the integrated care model could be generalized to other areas with different characteristics. Other studies are required to explore other dimensions that can be improved by integrated care for older patients.

## Conflict of interest

The authors declare no conflict of interest

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