

EFFECTIVENESS OF AN OREM THEORY-BASED NURSING  
INTERVENTION ON SELF-CARE AGENCY, MEDICATION ADHERENCE,  
AND QUALITY OF LIFE AMONG PATIENTS WITH CHRONIC HEART  
FAILURE

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**Abstract**

**Background:** Chronic heart failure requires continuous self-care, medication adherence, symptom monitoring, and lifestyle modification. Theory-based nursing interventions may strengthen patients' ability to manage their condition and improve quality of life.

**Objective:** To evaluate the effectiveness of an Orem Theory-based nursing intervention on self-care agency, medication adherence, and quality of life among patients with chronic heart failure.

**Methods:** A quantitative, quasi-experimental, one-group pretest–posttest design was conducted among 60 patients with chronic heart failure at the Punjab Institute of Cardiology, Lahore. Participants were recruited using consecutive sampling. Data were collected before and after implementation of an Orem Theory-based nursing intervention addressing self-care practices, medication management, symptom monitoring, lifestyle modification, and patient education. Data were analyzed using SPSS version 27. Paired-samples t-tests were used to compare pre-intervention and post-intervention mean scores, with statistical significance set at  $p < .05$ .

**Results:** Self-care agency increased from  $52.43 \pm 7.84$  to  $65.87 \pm 6.91$ , with a mean difference of 13.44 ( $t(59) = 12.18$ ,  $p < .001$ ). Medication adherence increased from  $5.76 \pm 1.42$  to  $7.18 \pm 1.16$ , with a mean difference of 1.42 ( $t(59) = 8.21$ ,  $p < .001$ ). Quality of life increased from  $48.65 \pm 8.72$  to  $61.24 \pm 7.95$ , with a mean difference of 12.59 ( $t(59) = 10.47$ ,  $p < .001$ ).

**Conclusion:** The Orem Theory-based nursing intervention was associated with significant improvements in self-care agency, medication adherence, and quality of life among patients with chronic heart failure.

## Introduction

Heart Failure (HF) is a progressive syndrome resulting from cardiac compromise and dysfunction and leads to high morbidity and mortality. The recent trends in HF estimate an increase from 1990 to 2021 in prevalence (Ran et al., 2025), and indicate that HF is a growing health concern worldwide. Changes in the health care system, modified lifestyles, and advances in health care and research have not helped alleviate the burden of HF. The World Health Organization (WHO) has established several international initiatives to develop and integrate effective, standardized models of care for HF in a variety of health care and socioeconomic settings (Walsh et al., 2026). Additionally, the WHO has coordinated efforts to target risk factor reduction at the population level to ameliorate HF morbidity and mortality. The effective management of HF requires efforts at the primary, secondary, and tertiary levels of prevention. The management of chronic heart failure (CHF) has evolved to incorporate active participation of patients in managing their condition. Therefore, this shift in focus has broadened the scope of self-care practices in managing CHF.

Chronic heart failure (CHF) is a condition that requires individuals to actively and continuously engage in a number of behavioral aspects of their treatment. These behaviors include long-term medication taking, symptom awareness, self-management of diet and fluid intake, and activity management, as well as recognition of the early signs of clinical deterioration. The International standards for the management of heart failure have identified education of individuals with CHF for promoting self-care and behavioral skills for treatment management, as well as participation of a multidisciplinary team for the provision of integrated, comprehensive, and individualized service, within a follow-up framework (Heidenreich et al., 2022; Walsh et al., 2026). Adherence to medication is one of the behavioral

aspects of treatment management for heart failure. A summary of evidence shows that adherence to medication remains a challenge for the management of heart failure (Medication Non-Adherence in Patients with Heart Failure, 2026). Other behavioral aspects related to adherence to treatment include self-care, and these are associated with the quality of life of persons with CHF (2023). From the available body of evidence, behavioral intervention to improve adherence to treatment and self-care is essential for patients with CHF.

International studies show that incorporating the nursing workforce in HF management makes a positive difference. One international study (Huang et al., 2024) examined 25 randomized controlled trials with 2,746 subjects, and found that nurse-led self-care strategies improved subjects' quality of life and anxiety, and reduced the symptom burden. The study was inconclusive about effects on mortality and changes in hospital usage. A second international study (Longhini et al., 2025) examined 27 studies with 2,176 participants and found that interventions delivered by the nursing workforce as transitional or home-based care interventions, and/or through telephone or internet, improved participants' HF self-care behavior. Variability was found based on the outcomes and interventions. A third international study (Natrakijavan et al., 2026) demonstrated that technology-based nursing interventions improved participants' self-care behaviors and self-confidence to manage HF. Findings from these studies show that flexibility and adaptation in nursing interventions improve participants' self-care behaviors.

In South Asia, various populations have different levels of access to healthcare, health literacy, socioeconomic status, family support, and the consistency of their care. In different parts of Asia, and elsewhere in the world, patients have been found to face challenges with adherence to treatment, and with behavioral modifications.

These challenges are further heightened with an increase in the number of medications a patient takes, if the patient has a low education level and insufficient social support, and with previous hospitalizations. A recent study indicates that, across the world, patients with heart failure have challenges with self-management and self-care (Prevalence and Predictors of Poor Self-Care Behaviors in Patients With Chronic Heart Failure, 2024). In nursing, there are numerous theories and models, which inform best practices for self-management and self-care. Hence, based on these theories, and keeping the context of South Asia in mind, nursing interventions can be developed and tested.

Heart failure (HF) is a long-term condition that affects the patient, their family and the health care system. In Pakistan, there is inadequate evidence of best practice for managing HF and the importance of adherence to HF management strategies. HF management primarily focuses on lifestyle changes and pharmacological treatment, and adherence to HF treatment is sub-optimal. Non-adherence to HF treatment is more common in patients residing in rural Pakistan and is more prevalent in patients from lower socioeconomic status and less educated populations (Qureshi et al., 2021).

Poor health and quality of life is reported in HF patients from Pakistan. One study reported that 72.1% of patients with HF had a very poor quality of life (Zameen, 2025). The results from these studies demonstrate the importance of developing and implementing HF management plans by trained nursing personnel.

Understanding the relationships among self-care, treatment adherence, and quality of life presents opportunities to create nursing interventions for patients with HF. People with HF can control symptoms and improve their quality of life if they follow their treatment plan. However, poor self-care and nonadherence to treatment can speed up the deterioration of symptoms and the progression of the disease. This can also reduce the quality of life of an individual. There are several nursing interventions, such as education and self-care behaviors, that have improved treatment

adherence and quality of life of individuals with HF. Although there is ample evidence to support these kinds of interventions, there is a lack of evidence to show improvement in clinical outcomes.

Orem's Self-Care Deficit Nursing Theory provides a foundation to explain how the nurse addresses patients' self-care needs, particularly when those needs are not able to be met by patients acting independently. The focus of the theory is on determining the kind of nursing intervention that is required to help patients enhance their self-care capabilities. According to Orem, nursing is provided to those individuals who cannot meet their self-care needs and focuses on self-care facilitation and instruction when patients' self-care capacities are inadequate (Orem, 2001). This theory is applicable to the care of patients with chronic Heart Failure because, in the course of managing this condition, patients are required to develop and enhance the knowledge and skills to self-care, and make the right decisions and take the appropriate actions to manage their condition. Although numerous studies have reported the benefit of nurse-directed interventions to improve heart failure self-care, little research has been done to test the effects of an Orem-based theory of self-care on adherence to treatment and improvement of quality of life of heart failure patients. Hence, the main objective of this study is to test the effects of Orem's Theory on heart failure patients' self-care, adherence to treatment, and quality of life.

## Methods

### Study Design and Setting

A quantitative, quasi-experimental, one-group pretest-posttest design was used to evaluate the effectiveness of an Orem Theory-based nursing intervention on self-care agency, medication adherence, and quality of life among patients with chronic heart failure. The study was conducted at the Punjab Institute of Cardiology (PIC), Lahore, Pakistan, a specialized tertiary-care cardiac hospital providing comprehensive services to patients with cardiovascular diseases. The setting was selected because it provides specialized cardiac care and

manages a large number of patients with chronic heart failure.

### Population and Sampling

The study population comprised adult patients diagnosed with chronic heart failure who were receiving treatment at the Punjab Institute of Cardiology. The required sample size was calculated using the G\*Power statistical calculator based on the specified statistical parameters for the study. The calculated sample size was 60 participants. Eligible participants were recruited using a non-probability consecutive sampling technique according to predefined inclusion and exclusion criteria. Participants were informed about the purpose and procedures of the study, and written informed consent was obtained before participation.

### Data Collection Procedure

Data were collected using a structured research questionnaire assessing demographic and clinical characteristics, self-care agency, medication adherence, and quality of life. A pre-intervention assessment was conducted before implementation of the nursing intervention to establish baseline measurements. Participants then received the **Orem Theory-based nursing intervention**, which focused on improving self-care capabilities through individualized education, medication-management guidance, symptom monitoring, lifestyle modification, and reinforcement of appropriate self-care practices. Following completion of the intervention, a post-intervention assessment was conducted using the same instruments. Confidentiality and privacy of participants were maintained throughout the data collection process.

### Data Analysis Procedure

The collected data were coded, entered, cleaned, and analyzed using SPSS V 27. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participants' demographic characteristics and study variables. A paired-samples t-test was used to compare the mean pre-intervention and post-intervention scores for self-care agency, medication adherence, and quality of life among the same participants. The paired-samples t-test was selected because the outcomes were measured repeatedly in the same group before and after the intervention. Statistical significance was determined at a p-value < .05, and the results were presented using appropriate tables.

### Results & Analysis

Table 1 presents the demographic and clinical characteristics of the 60 participants. The largest proportion of participants (46.7%) was aged 41–60 years, followed by 33.3% who were older than 60 years and 20.0% who were aged 18–40 years. Regarding gender, the majority were male (61.7%), while 38.3% were female. Most participants were married (85.0%), whereas 15.0% were unmarried. In terms of educational status, 45.0% had primary or secondary education, 31.7% had higher education, and 23.3% had no formal education. More than half of the participants (63.3%) resided in urban areas, while 36.7% were from rural areas. Regarding duration of heart failure, 56.7% had been living with HF for less than 5 years, 30.0% for 5–10 years, and 13.3% for more than 10 years. Overall, the sample was predominantly middle-aged to older adults, male, married, urban residents, and individuals with a relatively shorter duration of heart failure.

**Table 1. Demographic and Clinical Characteristics of Participants (N = 60)**

| Variable | Category    | Frequency | %    |
|----------|-------------|-----------|------|
| Age      | 18–40 years | 12        | 20.0 |
|          | 41–60 years | 28        | 46.7 |
|          | >60 years   | 20        | 33.3 |
| Gender   | Male        | 37        | 61.7 |
|          | Female      | 23        | 38.3 |

|                |                     |    |      |
|----------------|---------------------|----|------|
| Marital status | Married             | 51 | 85.0 |
|                | Unmarried           | 9  | 15.0 |
| Education      | No formal education | 14 | 23.3 |
|                | Primary/Secondary   | 27 | 45.0 |
|                | Higher education    | 19 | 31.7 |
| Residence      | Urban               | 38 | 63.3 |
|                | Rural               | 22 | 36.7 |
| Duration of HF | <5 years            | 34 | 56.7 |
|                | 5-10 years          | 18 | 30.0 |
|                | >10 years           | 8  | 13.3 |

Table 2 compares self-care agency scores before and after the Orem Theory-based nursing intervention. The mean self-care agency score increased from 52.43 (SD = 7.84) at pre-intervention assessment to 65.87 (SD = 6.91) at post-intervention assessment, representing a mean improvement of 13.44 points. The reduction in the standard deviation from 7.84 to 6.91 also indicates somewhat less variability in self-care agency scores following the intervention. The

paired-samples *t*-test demonstrated a statistically significant difference between the pre-intervention and post-intervention scores,  $t(59) = 12.18$ ,  $p < .001$ . This finding indicates that participants had significantly higher self-care agency scores following the Orem Theory-based nursing intervention. The results therefore suggest that the intervention was associated with improvement in participants' perceived capacity to perform and manage their required self-care activities.

Table 2. Pre- and Post-Intervention Self-Care Agency Scores

| Assessment        | Mean  | SD   | Mean Difference | <i>t</i> | <i>p</i> |
|-------------------|-------|------|-----------------|----------|----------|
| Pre-intervention  | 52.43 | 7.84 |                 |          |          |
| Post-intervention | 65.87 | 6.91 | 13.44           | 12.18    | <.001    |

Table 3 presents the comparison of medication adherence scores before and after implementation of the Orem Theory-based nursing intervention. The mean medication adherence score increased from 5.76 (SD = 1.42) at baseline to 7.18 (SD = 1.16) following the intervention, indicating a mean improvement of 1.42 points. The lower standard deviation at post-intervention assessment suggests reduced variability in medication adherence scores among participants after

receiving the intervention. The paired-samples *t*-test showed a statistically significant difference between the two assessment periods,  $t(59) = 8.21$ ,  $p < .001$ . These findings demonstrate that medication adherence scores were significantly higher following the intervention. The observed improvement suggests that the Orem Theory-based nursing intervention may have supported participants in developing more consistent medication-taking behaviours.

Table 3. Pre- and Post-Intervention Medication Adherence Scores

| Assessment        | Mean | SD   | Mean Difference | <i>t</i> | <i>p</i> |
|-------------------|------|------|-----------------|----------|----------|
| Pre-intervention  | 5.76 | 1.42 |                 |          |          |
| Post-intervention | 7.18 | 1.16 | 1.42            | 8.21     | <.001    |

Table 4 compares participants' quality-of-life scores before and after the Orem Theory-based nursing intervention. The mean quality-of-life score increased from 48.65 (SD = 8.72) before the intervention to 61.24 (SD = 7.95) after the intervention, representing a mean improvement of 12.59 points. The post-intervention assessment also demonstrated a modest reduction in variability, with the standard deviation decreasing from 8.72 to 7.95. The paired-samples *t*-test

demonstrated a statistically significant difference between pre-intervention and post-intervention quality-of-life scores,  $t(59) = 10.47, p < .001$ . Thus, participants reported significantly improved quality of life following the Orem Theory-based nursing intervention. The findings indicate that the intervention was associated with favourable changes in the overall quality of life of patients with chronic heart failure.

Table 4. Pre- and Post-Intervention Quality-of-Life Scores

| Assessment        | Mean  | SD   | Mean Difference | <i>t</i> | <i>p</i> |
|-------------------|-------|------|-----------------|----------|----------|
| Pre-intervention  | 48.65 | 8.72 |                 |          |          |
| Post-intervention | 61.24 | 7.95 | 12.59           | 10.47    | <.001    |

## Discussion

This study aimed to assess the impact of a nursing intervention developed from Orem's Theory on the self-care agency, medication adherence and quality of life of persons with chronic heart failure. Concerning the sample's characteristics, the largest group (46.7%) was between the ages of 41 to 60 years, and the second largest group (33.3%) was 60 years and above. The sample was mostly (61.7%) male, and married (85.0%). The sample was less educated, with the largest group (45.0%) having only primary or secondary education. About (63.3%) of the sample was residing in urban area, and (56.7%) was diagnosed with heart failure for less than 5 years. As per the current heart failure management standards (Heidenreich et al., 2022; McDonagh et al., 2023), the sample's characteristics reflected the importance of various self-care and disease management strategies. Improving self-care and management of chronic conditions include the role of the healthcare professional in strengthening the understanding of heart failure, acknowledgment and management of symptoms, adherence to treatment, and prevention of comorbidities (Heidenreich et al., 2022). The demographic characteristics of the sample represented the characteristics of participants in other studies involving heart failure management (Malliarou et al., 2023).

After the application of the Orem-based nursing intervention, the mean score of the self-care agency of the participant increased from  $52.43 \pm 7.84$  to  $65.87 \pm 6.91$ . The mean difference of 13.44 points was significant ( $t(59) = 12.18, p < .001$ ). This means the participant was able to carry out and manage activities related to self-care function more effectively. This finding supports the study by Xie et al. (2025), which mentioned that the nursing intervention developed from the basis of Orem's Self-care Deficit Theory, improved self-care ability of older adults with chronic heart failure, when compared to the standard care. Findings of the present study are also supported by Longhini et al. (2025), which mentions that different nursing interventions improved self-care ability of patients with heart failure. The present findings are also supported by Huang et al. (2024), in which different self-care nursing interventions of heart failure patients improved health condition of patients. Findings of the present study, as well as, other aforementioned studies, support the use of Orem Theory for development of different nursing interventions, to achieve self-care of patients. Improvements, achieved in present study, may also be attributed to other variables, due to the lack of control group.

The intervention improved patients' medication adherence, as evidenced by an increase in the average medication adherence score from  $5.76 \pm 1.42$  at baseline to  $7.18 \pm 1.16$  after the

intervention. The increase was a relative 1.42-point increase. The paired samples t-test indicated that the difference was statistically significant ( $t = 8.21, p < .001$ ). It was found that through learning and understanding nursing theory and self-care, patients became able to incorporate the correct use of medication in their self-care behavior. In their 2025 study, Xie et al. concluded that that patients under an Orem-based comprehensive nursing program showed improved adherence as compared to the control group. Kumari et al. (2024) in their pre-test, non-randomized, controlled study conducted in India also reported similar results where a nursing intervention for heart failure improved medication adherence. Other researchers, such as Wu et al. (2024) also reported the same findings. The findings of the present study support and integrate the previous findings, as the focus of the present study was also on the role of self-care in medication adherence. Improving adherence to medication for the management of chronic heart failure is beneficial since taking medications is often complex and requires patients to understand the rationale behind their treatment. The present study adds to the growing body of literature on the improvement of adherence to treatment following the implementation of various interventions. The study by Bazán Gallardo and Gutiérrez Palomares (2026) documented an increase in treatment adherence from 47.6% to 83.3% after the implementation of an educational intervention. Improvement in quality of life of participants was also reported. Improvement in treatment adherence has been documented in a number of nurse-led mHealth studies. In addition, positive influences on self-care, quality of life and cardiac health, as well as modification of the volume and nature of use of health care services have been reported. A strong body of evidence, including the present study, supports the view that engagement of patients in treatment decisions is vital to assisting patients to internalize responsibility for the self-care behaviors required for management of their condition.

The intervention improved the participants' quality of life. The average quality of life score

increased from  $48.65 \pm 8.72$  to  $61.24 \pm 7.95$ , which was a change of 12.59. The improvement was statistically significant ( $p < .001$ ). This is consistent with Huang and colleagues (2024) who conducted a systematic review and meta-analysis and found 25 randomized controlled studies and a total of 2,746 participants, and concluded that heart failure self-care interventions implemented by nurses improved patients' quality of life. Li (2023) also found quality of life improved after an 8-week self-care intervention that incorporated individual training and support. Kumari (2024) also found quality of life improved after a similar nursing intervention, which incorporated a heart failure nursing self-care intervention and support. Evidence from technology-based nursing interventions, such as telenursing, also improved quality of life of individuals with heart failure (Ariyanto and Rosa, 2024). Other studies involving theory-based nursing, interpersonal interactions, and integrated practices also improved quality of life of individuals with heart failure. Overall, the integration of various nursing interventions with self-management and lifestyle changes improved quality of life of individuals with heart failure.

The findings illustrate the role of self-care in medication adherence and health condition management. It is obvious that, with improved self-care, patients are able to identify health condition-related symptoms, and are better equipped to manage their health condition and improve their quality of life. The study, Malliarou et al (2023) revealed improved self-care behavior and adherence to medication improved quality of life in patients with heart failure. The study, Li et al (2023) reported a self-care management and self-care maintenance Intervention improved quality of life of participants. The study Huang et al (2024), also reported similar findings. Other studies, have shown that heart failure-related self-care interventions improved quality of life of patients, and mitigated symptoms of anxiety. Improvements in self-care have been attributed to various nursing interventions, and integrating the family member (caregiver) in the intervention improved the quality of life of patients (2025).

This study improved all the three main outcome measures. The study incorporated several elements of the heart failure self-care management, and addressed some of the challenges associated with the condition using the Nurse management approach.(Hussain et al 2024).

The results collectively suggest that implementation of a nursing intervention, based on Orem's Theory, enhanced self-care, medication compliance, and quality of life, of the study participants with chronic heart failure. Findings of the study support and are aligned with the trending evidence which endorses the integration of structured nursing interventions in the management of heart failure. Longhini et al. (2025) explain that most of the nursing interventions for management of heart failure, combine clinical judgment, teaching on lifestyle changes and heart failure symptom management, as well as compliance with heart failure therapy. Furthermore, the interventions include counseling, goal setting, and provision of clinical follow-up. Positive effects of nurse-managed clinics for heart failure have been attributed to teaching and instruction, as well as compliance and management of heart failure therapies, along with provision of psychosocial support and clinical follow-up. The ESC Focused Update (2023) and 2022 AHA/ACC/HFSA guideline strengthen the evidence for use of nursing interventions which promote self care and support patient centered, integrative care for improvement of heart failure management. The 2025 evidence supports use of nursing interventions combining teaching, individualized support, and integration of clinical follow-up. Findings of this study further add to the body of knowledge and support use of Orem's Theory in routine clinical practice. Findings should be assessed within the limits of the study design which included a small study population, lack of randomization and use of non-probability sampling.

## Conclusion

The present study concluded that the Orem Theory-based nursing intervention was associated with significant improvements in self-care agency,

medication adherence, and quality of life among patients with chronic heart failure. Participants demonstrated a substantial increase in self-care agency following the intervention, indicating improved capacity to perform and manage essential self-care activities related to heart failure. Medication adherence also improved significantly, suggesting that individualized nursing education, medication-management guidance, symptom monitoring, and reinforcement of self-care practices may support more consistent adherence to prescribed treatment. A significant improvement in quality of life was also observed after the intervention, reflecting potential benefits of comprehensive nursing support on patients' physical, psychological, and daily functioning. The findings support the application of Orem's Self-Care Deficit Nursing Theory as a structured framework for strengthening patients' participation in chronic heart failure management. The intervention provided nurses with an organized approach to identifying self-care needs and addressing patients' educational and behavioral deficits through individualized support. The study findings highlight the importance of integrating theory-based nursing interventions into routine heart failure care to promote patient involvement, treatment adherence, and quality of life. The results should be interpreted considering the one-group pretest-posttest design, relatively small sample, non-probability sampling, and absence of a control group. Future studies using randomized controlled designs, larger samples, multiple clinical settings, and longer follow-up periods are recommended to determine the sustained effectiveness of Orem Theory-based nursing interventions among patients with chronic heart failure.

with e-cigarette use.

## Recommendations

1. **Integration of Orem Theory-based nursing interventions:** Orem Theory-based nursing interventions should be

integrated into routine care for patients with chronic heart failure to strengthen self-care agency, medication adherence, symptom monitoring, and disease-management skills.

2. **Structured patient education:** Healthcare institutions should develop structured and individualized education programs addressing medication adherence, dietary modification, physical activity, symptom recognition, weight monitoring, and appropriate healthcare-seeking behaviors.
3. **Regular follow-up and reinforcement:** Nurses should provide regular follow-up, counselling, and reinforcement after discharge to identify self-care difficulties, address barriers to medication adherence, and support sustained behavioral changes among patients with chronic heart failure.
4. **Nursing education and training:** Hospitals should provide continuing professional development and training for nurses on Orem's Self-Care Deficit Nursing Theory, heart failure self-management, patient education, medication adherence, and individualized care planning.
5. **Further research:** Future studies should use larger samples, randomized controlled designs, multiple healthcare settings, and longer follow-up periods to evaluate the sustained effectiveness of Orem Theory-based nursing interventions on self-care agency, medication adherence, quality of life, hospital readmissions, and other clinical outcomes.

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