

TITLE PAGE

RESEARCH ARTICLE

**Enhancing Awareness of Urinary Incontinence Among Community-Dwelling Elderly
Through Structured Self-Learning: Evidence from Rural Puducherry, India**

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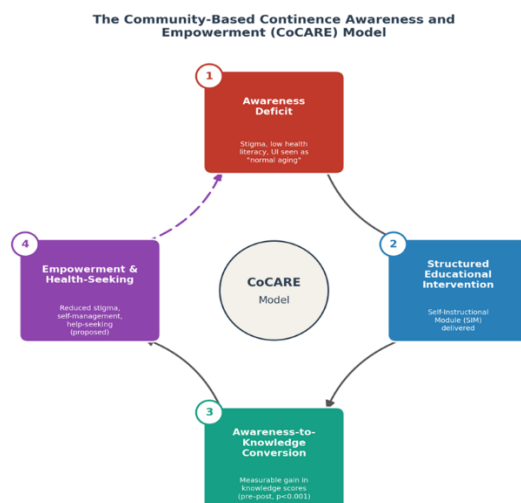
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Original Research article

Enhancing Awareness of Urinary Incontinence Among Community-Dwelling Elderly Through Structured Self-Learning: Evidence from Rural Puducherry, India

Research Highlights:

- Promotes healthy aging and aligns with WHO's Decade of Healthy Ageing (2021–2030) goals. Urinary incontinence (UI) is a prevalent but underreported health issue among older adults, causing significant physical, psychological, and social distress.
- Globally, UI affects 15–35% of community-dwelling elderly and up to 70% in long-term care facilities.
- Many elderly individuals perceive UI as a normal part of aging, leading to delayed diagnosis and poor management. Stigma, embarrassment, and lack of awareness prevent elderly individuals from seeking timely medical help. UI negatively affects quality of life, causing sleep disturbances, depression, social withdrawal, and reduced self-esteem.
- The study evaluated the effectiveness of a Self-Learning Module (SLM) on improving knowledge regarding urinary incontinence (UI) among elderly individuals in a selected rural village of Puducherry, India.
- The study findings support a four-stage translational framework for rural geriatric continence care — the Community-Based Continence Awareness and Empowerment (CoCARE) Model.



ABSTRACT

Urinary incontinence (UI) is a common yet underreported health problem among the elderly, significantly affecting their physical, psychological, and social well-being. Limited awareness and misconceptions about UI contribute to poor management and reduced quality of life among older adults, particularly in rural settings. Educational interventions such as Self-Learning Modules (SIM) can effectively enhance knowledge and promote health-seeking behavior. The study aimed to (1) assess the pre-test and post-test level of awareness and knowledge regarding urinary incontinence among community-dwelling elderly individuals, and (2) evaluate the effectiveness of a Self-Learning Module in improving their awareness and knowledge in a selected rural village of Puducherry.

A quasi-experimental research design was adopted. A total of 60 elderly participants aged 60 years and above were selected through a non-probability convenience sampling technique. Formal permission and ethical clearance were obtained prior to data collection. A validated and reliable self-structured knowledge questionnaire was used to assess participants' knowledge regarding urinary incontinence. The pre-test was conducted for both experimental and control groups. The Self-Learning Module was administered to the experimental group, and the post-test was conducted on the 7th day using the same questionnaire. The control group received the module after the post-test to ensure ethical compliance. In the experimental group, the mean pre-test knowledge score was 6.47 ± 2.33 , which increased to 11.83 ± 2.81 in the post-test. In the control group, the mean pre-test score was 4.73 ± 2.45 and the post-test score was 5.60 ± 0.62 . The paired *t*-test value ($t = -23.09, p < 0.001$) and independent *t*-test value ($t = 11.88, p < 0.001$) indicated a statistically significant improvement in knowledge regarding urinary incontinence among the experimental group following the intervention. The study concluded that the Self-Learning Module was highly effective in improving the awareness and knowledge of elderly individuals regarding urinary incontinence. Structured educational interventions can play a pivotal role in empowering older adults, reducing stigma, and promoting early management of urinary incontinence, particularly in rural communities.

Keywords: Urinary incontinence, elderly, self-learning module, quasi-experimental design, knowledge.

INTRODUCTION

"Knowledge is the antidote to fear, and awareness is the first step toward dignity."

Urinary incontinence (UI) is a significant geriatric health concern characterized by the involuntary leakage of urine, which results in physical discomfort, psychological distress, and social embarrassment among older adults (Abrams et al., 2017). Globally, UI affects approximately 15% to 35% of community-dwelling elderly individuals, with prevalence increasing to 50%–70% among residents of long-term care facilities (Gibson & Wagg, 2020). The International Continence Society (ICS) classifies UI into stress, urge, mixed, overflow, and functional types, each with distinct pathophysiological mechanisms and management strategies (D'Ancona et al., 2019).

The causes of UI in the elderly are multifactorial, including physiological aging of the lower urinary tract, neurological alterations, comorbid conditions, cognitive impairment, reduced mobility, and adverse drug effects (Pesonen et al., 2020). Age-related changes such as decreased bladder capacity, increased post-void residual urine, detrusor overactivity, and reduced urethral closing pressure predispose older adults to UI (Chapple et al., 2018). Chronic diseases such as diabetes mellitus, stroke, Parkinson's disease, and dementia further elevate the risk (Jerez-Roig et al., 2021).

Despite its prevalence, UI remains underreported and undertreated, with only 25% to 50% of affected individuals seeking medical help (Lukacz et al., 2017). This "iceberg phenomenon" is largely due to embarrassment, stigma, misconceptions that UI is a normal part of aging, and lack of awareness of treatment options (Vethanayagam et al., 2017). Moreover, inadequate screening and limited geriatric training among healthcare providers contribute to missed diagnoses and poor management (Newman, 2019).

Urinary incontinence significantly affects quality of life. Elderly individuals with UI are more likely to experience depression (30%–50%), anxiety (21%–33%), and social withdrawal than those without UI (Coyne et al., 2020). Fear of urine leakage often leads to reduced social participation, decreased mobility, and physical deconditioning, thereby exacerbating frailty (Kvåle & Nymoen, 2019; Stenzelius et al., 2018).

Economically, UI imposes a heavy burden on healthcare systems. In the United States alone, annual direct costs exceed \$19.5 billion, covering absorbent products, medications, diagnostic procedures, and institutional care (Wilson et al., 2021). Indirect costs, such as caregiver burden and lost productivity, further increase this economic strain (Milsom et al., 2019). In developing countries like India, limited healthcare infrastructure and financial constraints intensify the challenge (Irwin et al., 2018).

Although behavioral, pharmacological, and surgical interventions for UI are available, a considerable knowledge gap persists among older adults and caregivers (Tan et al., 2022). Many elderly individuals, especially in rural settings, mistakenly perceive UI as an inevitable aspect of aging (Souza et al., 2021). Educational interventions have been shown to effectively address this misconception. Palmer et al. (2020) found that structured health education significantly improved knowledge, self-efficacy, and treatment-seeking behaviors among elderly individuals with UI. Similarly, Huang et al. (2019) reported that self-learning modules (SIMs) improved knowledge retention and encouraged behavioral changes among older adults with limited mobility or literacy.

In India, where 8.5% of the population is aged 60 years and above (Census of India, 2021), UI is emerging as a major public health issue. The prevalence among community-dwelling elderly ranges from 23% to 42%, with higher rates observed in rural regions (Mathur et al., 2021; Sharma et al., 2022). Stigma, cultural beliefs, and gender norms contribute to the lack of help-seeking behavior in this population (Patel & Gokhale, 2020).

There is a wide gap between the prevalence of UI and awareness regarding its prevention and management among elderly individuals in rural India. Agarwal et al. (2023) reported that only 18% of elderly individuals in rural North India had adequate knowledge of UI causes and treatment options, underscoring the need for educational interventions. While many studies have assessed the impact of healthcare provider-led programs, few have evaluated self-learning modules tailored to elderly populations with varied literacy levels. SLMs represent a sustainable, low-cost approach to disseminating health education in resource-constrained rural settings (Rao & Kumar, 2022).

Most Indian studies on UI have focused on urban populations, leaving a critical research gap regarding rural elderly individuals, who constitute about 65% of India's older population (Ministry

of Statistics and Programme Implementation [MOSPI], 2021). Evidence suggests that early educational intervention can prevent complications such as urinary tract infections, skin breakdown, falls, and premature institutionalization (Wagg et al., 2022). Empowering elderly individuals with knowledge about UI also aligns with the *World Health Organization's* (2021) global framework for promoting healthy aging and functional independence.

In light of these considerations, this study aims to develop and assess the effectiveness of a self-learning module in improving awareness and knowledge regarding urinary incontinence among community-dwelling elderly residents in a selected rural village of Puducherry. The findings will contribute to the development of evidence-based educational interventions tailored to the unique needs and circumstances of elderly individuals in rural communities.

STATEMENT OF THE PROBLEM:

A Quasi-experimental study to assess the Awareness of Urinary Incontinence among Community-Dwelling Elderly through Structured Self-Learning Module at a selected Rural community area, Puducherry, India.

OBJECTIVES:

- To assess the Pretest and Posttest level of knowledge regarding urinary incontinence among elderly.
- To evaluate the effectiveness of Self-Learning module on knowledge regarding urinary incontinence among elderly in the experimental group.

HYPOTHESES

H₁: There is a significant difference between the Pre-test and Post-test level of knowledge regarding urinary incontinence among elderly in the experimental group.

Research Methodology: Quantitative research approach was used for this study. A Quasi experiment design was adopted for this study and 60 elderly patients with the age group of 60 above were selected by non-probability convenience sampling

technique. Formal Permission was obtained from authorities of Institution and from ethical committee. A Self Structured Knowledge Questionnaire was used to collect data at a selected village and the tool was validated by experts and found reliable. Self-learning module consists of definition, incidence, risk factors, types, clinical manifestation, diagnostic evaluation and pharmacological management, and nursing management, self-care management and prevention of urinary incontinence. Pre- test assessment of level of knowledge was conducted for the both groups and the researcher administered the self-learning module for the experimental group and the post test was done on the 7th day after intervention by using the same questionnaires. For the control group, self-learning module was given after the post test.

Results and Discussion:

In study group majority of elderly 14(46.7%) were in the age group 66 To 70 years whereas in control group majority 15(50%) were in the age group 60 To 65 years. Regarding the educational status, the majority of them study group 25(83.3%) and in control group 19(63.4%) had non-formal education. Group majority of elderly were Unemployed. In study group majority of elderly 16(53.3%) were in Primary Education whereas in control group majority 20(66.7%) were in Illiterate. Both in study 17 (56.6%) and control 20(66.7%) group majority of elderly Family Monthly Income were below 6174. Both in study 25 (83.3%) and control 26(86.7%) group majority of elderly were Married.

Table 1: - Frequency and percentage distribution of pretest and post-test of the level of knowledge regarding urinary incontinence among elderly in study group.

(N=30)

LEVEL OF KNOWLEDGE	PRETEST		POST TEST	
	n	%	n	%
Inadequate	11	36.7	0	0

Moderate	19	63.3	8	26.7
Adequate	0	0	22	73.3

In pretest, Majority of elderly 19(63.3%) had Moderate, and 8(26.7%) had Inadequate, level of knowledge and the mean and standard deviation the level of knowledge regarding urinary incontinence among elderly is (6.47 $\pm$ 2.330) respectively.

In post- test, Majority of elderly 22(73.3%) had Adequate, and 8(26.7%) had Moderate level of knowledge and the mean and standard deviation the level of knowledge regarding urinary incontinence among elderly is (11.83 $\pm$ 2.805) respectively.

Table 2: Effectiveness of self-learning module on knowledge regarding urinary incontinence among elderly in experimental and control group. (N=30)

Level of knowledge	GROUP	TEST	MEAN	STANDARD DEVIATION	't' VALUE Paired -t test	'p' VALUE
	Exp Group	Pretest	6.47	2.330	23.09	0.001** S
		Posttest	11.83	2.805		
	Control Group	Pretest	4.73	2.449	2.11	0.049
		Posttest	5.60	0.621		

**** -p < 0.001 S-significant, NS-Non-Significant.**

Table -2 shows that, the mean score of Effectiveness of self- learning module on knowledge regarding urinary incontinence among elderly in study group in the pre-test was 6.47 $\pm$ 2.330 and the mean score in the post- test was 11.83 $\pm$ 2.805. The calculated paired 't' test value of t =23.09 shows statistically highly significant difference of Effectiveness of self-learning module on knowledge regarding urinary incontinence among elderly in study group.

The mean score of Effectiveness of self-learning module on knowledge regarding urinary incontinence among elderly in control group in the pre-test was 4.73 ± 2.449 and the mean score in the post- test was 5.60 ± 0.621 . The calculated paired 't' test value of $t = 2.11$ shows non-significant difference of Effectiveness of self- learning module on knowledge regarding urinary incontinence among elderly in control group.

Table–3. Comparison of self-learning module on knowledge regarding urinary incontinence among elderly in study group and control group.

(N=60)

	Test	Group	Mean	Standard deviaton	't' value Independent -t test	'p' value
Level of knowledge	Pretest	study group	6.47	2.330	2.80	0.007 *S
		Control group	4.73	2.449		
	Posttest	study group	11.83	2.805	11.88	0.000 ** S
		Control group	5.60	0.621		

****p<0.001 HS- highly significant, NS-Non-Significant.**

The mean score of Comparison of self-learning module on knowledge regarding urinary incontinence among elderly in pretest of study group was 6.47 ± 2.330 and the meanscore in the control group was 4.73 ± 2.449 . The calculated independent 't' test value of $t = 2.80$ shows statistically significant difference between self-learning module on knowledge regarding urinary incontinence among elderly in study group and control group of pretest.

The mean score of Comparison of self-learning module on knowledge regarding urinary

incontinence among elderly in posttest of study group was 11.83 ± 2.805 and the mean score in the control group was 5.60 ± 0.602 . The calculated independent 't' test value of $t = 11.88$ shows statistically highly significant difference between self-learning module on knowledge regarding urinary incontinence among elderly in study group and control group of posttest.

Conclusion:

The significantly higher posttest knowledge scores in the study group (11.83 ± 2.805) compared to the control group (5.60 ± 0.602) confirm the effectiveness of the self-learning module in improving awareness of urinary incontinence among community-dwelling elderly. These results support the integration of structured educational interventions into geriatric care to promote dignity, independence, and quality of life, while advancing equitable healthcare access in rural settings. This study provides a replicable, evidence-based model for future community health initiatives and lays the groundwork for culturally appropriate strategies that foster healthy aging.

FUTURE SCOPE

This study's single-village, convenience-sampled design ($N=60$) and short 7-day posttest interval limit generalizability and preclude assessment of retention. Future research should employ multi-site RCTs with longitudinal follow-up (3, 6, 12 months) to evaluate sustained knowledge and behavior change using validated KAP instruments. Comparative studies of delivery formats (audio-visual/mobile vs. print), particularly for illiterate participants, and models integrating community health workers (ASHA/ANM) could inform scalable rollout. Cost-effectiveness analyses against provider-led counseling would further support policy decisions.

PROPOSED CONCEPTUAL MODEL: THE COMMUNITY-BASED CONTINENCE AWARENESS AND EMPOWERMENT (CoCARE) MODEL

These findings support a four-stage translational framework for rural geriatric continence care — the Community-Based Continence Awareness and Empowerment (CoCARE) Model (Figure 1). The model moves from an Awareness Deficit stage (marked by stigma, low health literacy, and normalization of incontinence as inevitable, as reflected in this study's low pretest scores), through a Structured Educational Intervention stage (delivery of the low-cost Self-Learning Module), to an

Awareness-to-Knowledge Conversion stage (the significant knowledge gains observed here: paired $t = -23.09$, $p < 0.001$; independent $t = 11.88$, $p < 0.001$). The final proposed stage, Empowerment and Health-Seeking, denotes the hypothesized long-term outcome of sustained self-management and appropriate care-seeking behavior — not directly measured in this cross-sectional design but recommended as the focus of future longitudinal research. This framework offers a replicable model for community-based interventions targeting other underreported geriatric health conditions in resource-limited rural settings.

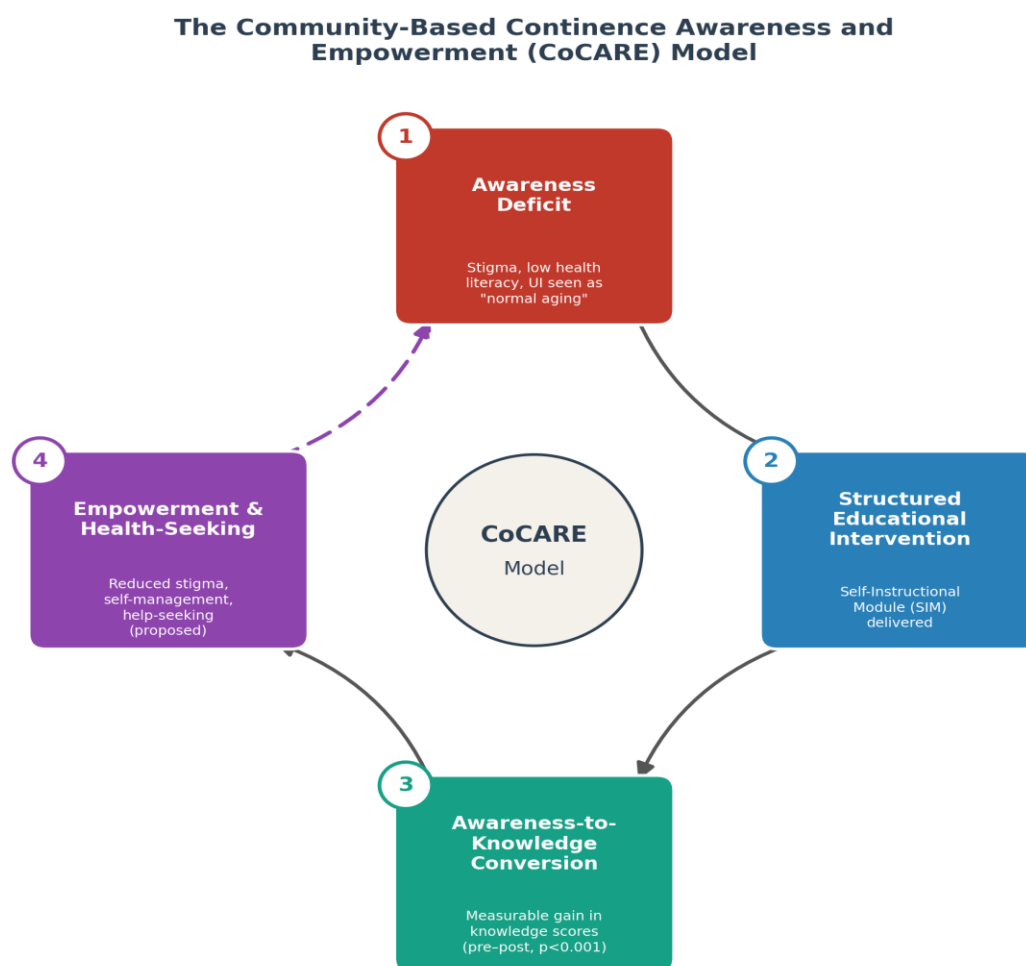


Figure 1: The Community-Based Continence Awareness and Empowerment (CoCARE) Model

DECLARATION OF CONFLICT OF INTEREST

The authors confirm that they have no conflicts of interest to declare.

FUNDING INFORMATION

No funding is received for this work.

DATA AVAILABILITY STATEMENT

The datasets generated during the current study are not publicly available as the study is not published yet in any other journal.

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