

An Empirical Analysis on Market Acceptance and Adoption Drivers of Reusable Medical Textiles in Hospitals

Carol Mariam Mathew¹, Dr.V.Mathangi,²

ABSTRACT

Healthcare institutions worldwide are increasingly focusing on sustainable operational practices to reduce environmental impact while maintaining high standards of patient care. Reusable medical textiles have emerged as an effective alternative to disposable medical textile products due to their environmental, economic, and operational benefits. Despite the growing awareness regarding sustainable healthcare practices, the adoption of reusable medical textiles remains limited in many healthcare institutions. This study aims to explore the factors influencing the adoption of reusable medical textiles in hospitals. The study proposes a conceptual framework that examines the influence of cost savings, sustainability, product quality, safety, ease of use, awareness, industrial waste reduction, quality assurance, and profitability on operational utilization and behavioural intention towards adoption. Furthermore, organizational factors are considered as a moderating variable affecting adoption decisions. The study contributes to sustainable healthcare literature by providing a comprehensive understanding of the institutional and behavioural determinants influencing the acceptance of reusable medical textiles. The proposed framework can assist healthcare administrators and policymakers in designing effective strategies to promote sustainable textile practices within healthcare environments.

Keywords: Reusable Medical Textiles; Sustainable Healthcare; Adoption Behaviour; Operational Utilization; Organizational Factors; Environmental Sustainability.

1. INTRODUCTION

The healthcare sector is one of the largest consumers of textile-based products, including surgical gowns, drapes, patient garments, bed linens, masks, and protective clothing. Traditionally, healthcare institutions have relied heavily on disposable medical textiles because of their convenience and perceived infection control benefits. However, the increasing volume of medical waste generated by disposable products has raised significant environmental and

¹ MBA Student, Sardar Vallabhbhai Patel International School of Textile and Management, Coimbatore - 641004

² Assistant Professor, Sardar Vallabhbhai Patel International School of Textile and Management, Coimbatore - 641004, email: vm@svpitm.ac.in

economic concerns. In recent years, reusable medical textiles have gained considerable attention as a sustainable alternative. These products are designed to undergo multiple laundering and sterilization cycles while maintaining their protective performance and durability. The adoption of reusable medical textiles offers several advantages, including waste reduction, lower long-term operational costs, improved resource efficiency, and reduced environmental footprint. Despite these benefits, healthcare organizations often face challenges in transitioning from disposable to reusable textile systems. Concerns related to safety, product quality, sterilization procedures, infrastructure requirements, and user acceptance frequently influence adoption decisions. Therefore, understanding the factors that drive or hinder the adoption of reusable medical textiles is essential for promoting sustainable healthcare operations. This study examines the institutional and behavioural factors that influence the adoption of reusable medical textiles in healthcare institutions and proposes a comprehensive framework for understanding adoption behaviour.

2. LITERATURE REVIEW

The increasing focus on sustainable healthcare has encouraged the adoption of reusable medical textiles as alternatives to disposable products. Studies by Van der Klink and Demirel (2025), McQuerry et al. (2021), and Lakkhumi et al. (2020) reported that reusable textiles provide effective infection control, greater durability, lower operational costs, and reduced healthcare waste. Similarly, Vozzola et al. (2020) and Keil et al. (2023) highlighted significant reductions in energy consumption, carbon emissions, and environmental impact through the use of reusable healthcare products. Research has also emphasized the importance of implementation and user acceptance. Yap et al. (2023) and Horn-Lodewyk et al. (2023) found that staff training, leadership support, and proper laundering protocols are critical for successful adoption. Harding et al. (2024; 2025), Georgievska et al. (2024), and van Nieuwenhuizen et al. (2024) reported that factors such as comfort, safety, usability, trust, and organizational support significantly influence healthcare professionals' acceptance of reusable textiles. Environmental sustainability remains a key driver of adoption. Baker et al. (2020), Gumera et al. (2024), Griffing and Overcash (2025), and Wardak et al. (2024) demonstrated that reusable gowns and other healthcare textiles reduce waste generation, greenhouse gas emissions, and resource consumption while maintaining clinical effectiveness. Additionally, studies by Hossain et al. (2024), Zhezhova et al. (2022), Cayrou et al. (2025), and Djordjic et al. (2025) highlighted the role of innovation, product quality, and effective maintenance practices in supporting sustainable healthcare operations. Overall, existing literature confirms that reusable medical

textiles offer substantial environmental, economic, and operational benefits. However, limited research has examined the combined influence of factors such as cost savings, sustainability, product quality, safety, ease of use, awareness, profitability, operational utilization, and organizational support on adoption behaviour. This gap forms the foundation for the present study on the adoption of reusable medical textiles in healthcare institutions.

3. STATEMENT OF THE PROBLEM

Healthcare institutions continue to face increasing pressure to improve environmental sustainability while maintaining operational efficiency and patient safety. Reusable medical textiles provide a promising solution for reducing healthcare waste and promoting sustainable resource utilization. Nevertheless, adoption rates remain inconsistent across healthcare organizations. Many institutions are uncertain about the long-term economic benefits, quality performance, safety standards, and operational implications associated with reusable textile systems. Furthermore, the influence of organizational support mechanisms on adoption behaviour remains insufficiently explored. Consequently, there is a need to identify and examine the key factors influencing the adoption of reusable medical textiles and to understand how these factors affect operational utilization and behavioural intention within healthcare institutions.

4. OBJECTIVES OF THE STUDY

1. To examine whether the level of acceptance of reusable medical textiles differs across types of hospitals.
2. To assess whether perceptions towards reusable medical textiles differ among different categories of healthcare professionals.
3. To analyse the influence of institutional adoption drivers on the operational utilization and behavioural intention towards adoption of reusable medical textiles in hospitals.

5. CONCEPTUAL FRAMEWORK

The conceptual framework proposes that institutional adoption drivers—namely cost savings, sustainability, product quality, safety, ease of use, awareness, industrial waste reduction, and profitability—influence the adoption of reusable medical textiles in healthcare institutions. These factors affect operational utilization, which represents the extent to which reusable medical textiles are implemented in healthcare operations. Increased operational utilization subsequently enhances behavioural intention towards adoption, reflecting the willingness of

healthcare professionals and institutions to embrace reusable textile solutions. Furthermore, organizational factors, including management support, infrastructure, policies, and institutional readiness, moderate the relationship between institutional drivers and operational utilization. Strong organizational support strengthens the adoption process, whereas inadequate support may hinder implementation. Thus, the framework emphasizes that the adoption of reusable medical textiles is shaped by both institutional drivers and organizational conditions.

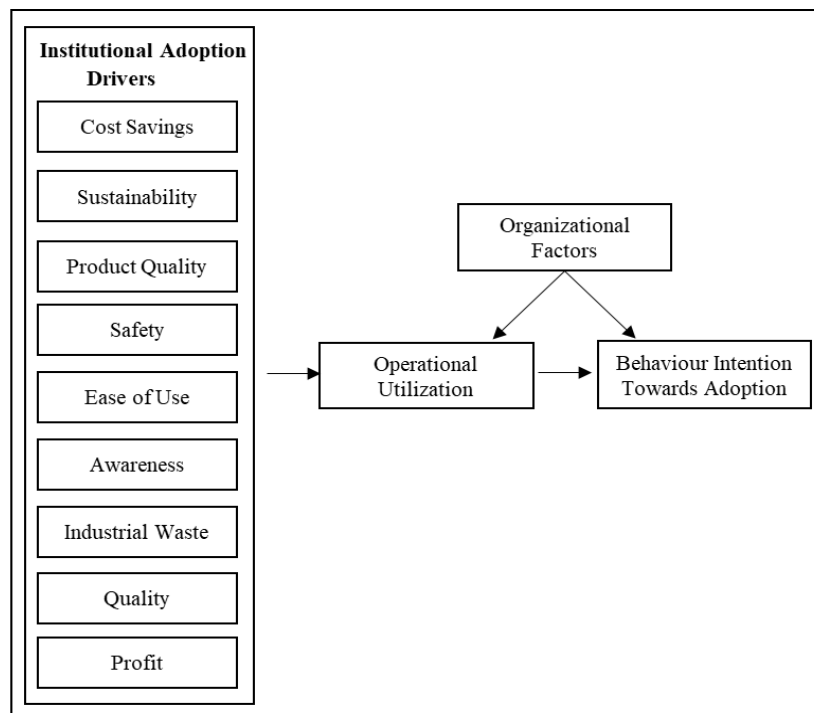


Fig 1: Conceptual Framework

6. RESEARCH METHODOLOGY

The study adopted a quantitative research approach to examine the factors influencing the adoption of reusable medical textiles in healthcare institutions. The target population consisted of healthcare professionals, including doctors, nurses, technicians, and hospital administrators working in healthcare organizations. A descriptive research design was employed, and a sample of 203 respondents was selected using convenience sampling. Primary data were collected through a structured questionnaire developed based on the objectives of the study. The collected data were analysed using various statistical tools, including percentage analysis, reliability analysis, exploratory factor analysis, correlation analysis, multiple regression analysis, and structural equation modelling. Statistical analysis was performed using SPSS and AMOS software to examine the relationships among the study variables and test the proposed conceptual framework.

6.1 MEASURES

The present study measures the adoption of reusable medical textiles using multiple constructs derived from the conceptual framework. The independent variables include cost savings, sustainability, product quality, safety, ease of use, awareness, industrial waste, quality, and profit, which represent the key institutional adoption drivers. These variables were measured through parameters such as cost efficiency, environmental benefits, durability, hygiene standards, usability, staff awareness, waste management practices, quality control, and financial performance. The dependent variables comprise operational utilization, reflecting the actual usage of reusable textiles in hospital operations, and behavioural intention towards adoption, indicating the willingness to adopt such textiles in the future. Organisational factors, including management support, resource availability, communication, and workflow adaptability, were considered as a moderating variable influencing the relationship between institutional drivers and adoption outcomes. All variables were measured using a 4-point Likert scale ranging from strongly disagree to strongly agree to ensure consistency and reliability in data collection.

7. FINDINGS

The study revealed that institutional factors such as cost savings, sustainability, product quality, safety, ease of use, awareness, and profitability play a significant role in influencing the adoption of reusable medical textiles in healthcare institutions. The findings also indicated that higher operational utilization leads to stronger behavioural intention towards adoption. Furthermore, organizational factors, including management support, infrastructure, and policy support, positively contribute to the successful implementation of reusable medical textile systems.

8. SUGGESTIONS

Healthcare institutions should increase awareness and provide regular training programs to educate healthcare professionals about the environmental and economic benefits of reusable medical textiles. Management should strengthen organizational support by developing appropriate policies, improving infrastructure, and ensuring quality standards. Emphasizing sustainability initiatives and encouraging the effective use of reusable medical textiles can further enhance adoption and support long-term healthcare waste reduction goals.

9. CONCLUSION

The adoption of reusable medical textiles represents a significant opportunity for healthcare institutions to improve sustainability performance while maintaining operational efficiency and patient safety. The transition from disposable to reusable textile systems requires a thorough understanding of institutional, behavioural, and organizational factors influencing adoption decisions. The conceptual framework proposed in this study integrates multiple adoption drivers and highlights the critical role of organizational support in facilitating successful implementation. By identifying the determinants of adoption behaviour, healthcare administrators can develop targeted strategies to encourage sustainable textile practices and achieve long-term environmental and economic benefits. The study provides a foundation for future empirical investigations into sustainable healthcare innovations and contributes to the growing body of knowledge on healthcare sustainability management.

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