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REVIEW

Effects of Intestinal Stoma Odor and Pouch Ballooning on Quality of Life and Associated Intervention Strategies

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Abstract: Intestinal stoma surgery is a prevalent treatment for conditions such as colorectal cancer; however, postoperative complications such as intestinal stoma odor and pouch ballooning are frequent, contributing to anxiety, depression, social limitations, and reduced quality of life for patients. In this article, the impact of intestinal stoma odor and pouch ballooning problems on patients' quality of life and related intervention strategies are reviewed. Relevant literature from the past decade was collected through searches in databases, including PubMed, Web of Science, and China National Knowledge Infrastructure (CNKI), and analyzed. It can be inferred from the review findings that intestinal stoma odor problems primarily result from the release of intestinal gas and feces, while pouch ballooning is influenced by factors such as dietary habits and intestinal dysbiosis. Identified interventions include dietary modifications, appropriate selection of ostomy products, and psychological support, as well as novel approaches such as improved ostomy pouch designs. The aim of this review is to serve as a clinical reference for optimizing the management of intestinal stoma odor and pouch ballooning to better improve the quality of life for patients with intestinal stoma.

Keywords: intervention strategies, intestinal stoma, odor, pouch ballooning, quality of life

Introduction

Research Background

Intestinal stoma surgery is a common treatment method for conditions such as colorectal cancer; however, it is also associated with various complications that can be uncomfortable for patients.[1] Among these, stoma odor and pouch ballooning are primary factors affecting their quality of life. Stoma odor not only contributes to low self-esteem and anxiety but may also lead to social withdrawal, while pouch ballooning is associated with an increased risk of peristomal skin damage and related complications. In recent years, with the growing emphasis on quality of life, these issues experienced by individuals with intestinal stomas have gradually become a focus of clinical attention. It has been demonstrated in multiple studies that stoma odor and pouch ballooning problems have a substantial adverse effect on patients' physical and mental health as well as social functioning.[2] Yang et al found that 46.0% of ostomy patients indicated that they were concerned about odor.[3] There are a variety of home and commercially available remedies to minimize ostomy pouch odor. These include nutritional instructions, reduction strategies such as filters that contain ingredients to collect molecules associated with odor, and the use of additives.[4] Meacham et al observed that differences in malodor intensity, hedonic tone, and character between the test ostomy pouch additives, the TB and ZnR-Orange reduced malodor intensity to the greatest extent, and the TB was ranked as the most pleasant smelling (hedonic tone), this

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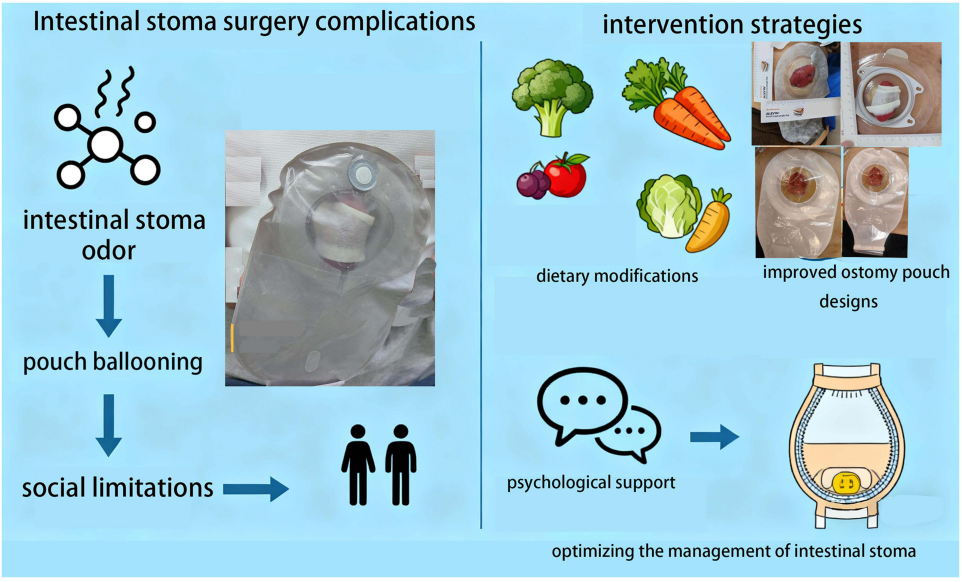
Graphical Abstract



information may help nurses and other healthcare providers when educating ostomates about their options.[5] Despite the prevalence of these complications, current intervention strategies for stoma odor and pouch ballooning remain inadequate. Traditional nursing approaches focus on ostomy care techniques and the prevention of complications, with insufficient attention given to the psychological well-being and social functioning of patients. Additionally, the absence of personalized and continuous intervention measures has made it challenging to address patients' long-term needs. Therefore, exploring more comprehensive and effective intervention strategies aimed at improving the quality of life of individuals with intestinal stoma has emerged as an important area of research.

Research Purpose

This review was designed to examine the impact of intestinal stoma odor and pouch ballooning on the quality of life of patients and to propose corresponding intervention strategies. The extent and scope of these effects were systematically evaluated, with a focus on patients' daily life, psychological well-being, and social interactions. The findings are intended to serve as a basis for developing targeted intervention measures.

Review of Related Research

Relevant literature published within the past decade was identified and analyzed through systematic searches of electronic databases, including PubMed, Web of Science, and the China National Knowledge Infrastructure (CNKI).

Impact of Intestinal Stoma Odor and Pouch Ballooning Problems on the Quality of Life of Patients

Findings from several studies have provided essential evidence for understanding post-surgical quality of life following intestinal stoma surgery, particularly among specific patient populations and older adults. For instance, Çelik et al conducted a phenomenological qualitative study exploring the perspectives of wheelchair-dependent individuals with spinal cord injury who underwent colostomy surgery.[6] Three thematic categories related to patients' bowel management experiences were identified in the study: (a) challenging experiences; (b) coping mechanisms; and (c) awareness of intestinal stoma. The authors found that ostomy knowledge acquired by patients through different sources contributed to

their sense of hope, although healthcare professionals were reported to provide limited support in fostering this optimism. This research provides valuable in-depth insights into understanding the experiences of specific patient populations following intestinal stoma surgery.

Paszyńska et al summarized the multifaceted impact of intestinal stoma surgery on patients' lives, highlighting effects on body image, intimate relationships, and sexual well-being.[7] The emphasis of their study was the necessity of providing perioperative education programs for both patients undergoing stoma surgery and their relatives to address potential physical and psychological challenges resulting from the surgery. Chrobak-Bień et al noted that the quality of life of patients with an intestinal stoma aged over 65 years was significantly influenced by factors such as daily stressors, age, marital status, place of residence, and level of education.[8] They also found a longer duration since intestinal stoma creation was associated with improved quality of life and psychological adaptation. The presence of family support was found to correlate with higher levels of stoma acceptance.

Regarding more specific impacts on the quality of life of patients with an intestinal stoma, MacDonald et al conducted a systematic review of the impact of emergency intestinal ostomy on patients' quality of life.[9] Follow-up assessments at 12 months showed that individuals who underwent emergency intestinal stoma creation had slightly lower quality of life compared to those who had similar surgeries without stoma creation. Risk factors for poorer quality of life that were identified in the study included female gender, end stoma, and ileostomy. In their study, Robitaille et al reported that the adverse impact of intestinal stoma on quality of life exceeded that of rectal resection.[10] Additionally, patients with severe low anterior resection syndrome (LARS) had quality of life scores comparable to those with an intestinal stoma, highlighting the considerable impact of intestinal dysfunction severity on overall well-being. With reference to psychological health, Mohamed et al investigated the relationship between resilience and health-related quality of life (HRQoL) in individuals with a permanent colostomy.[11] They noted that both HRQoL and resilience scores were low, with the lowest scores observed in the domain of mental health. The psychological challenges faced by patients with an intestinal stoma and the importance of interventions for improving patient resilience are highlighted in this study.

Collectively, it can be seen from these studies that the quality of life of patients with an intestinal stoma is influenced by a range of postoperative personal and social factors.

Causes of Intestinal Stoma Odor and Pouch Ballooning

The impact of intestinal stoma odor and pouch ballooning problems on patients' quality of life has been explored in several studies. For instance, Cai et al conducted a survey study involving 555 patients with a preventive ileostomy for rectal cancer and found that the DII was negatively correlated with the severity of gastrointestinal-related core symptoms and positively correlated with diarrhea or watery ostomy output symptom scores.[3] These results suggest that dietary guidance tailored to the DII may be beneficial for improving gastrointestinal symptoms and enhancing quality of life in patients with a preventive ileostomy. In a survey of 256 colorectal cancer patients who had undergone stoma surgery within the previous four weeks, Chang et al noted that both benefit finding and quality of life were at moderately low levels, with benefit finding identified as a positive factor influencing quality of life.[12] This study highlights the necessity of implementing targeted psychological interventions to enhance patients' benefit finding, thereby bettering their quality of life.

Liu et al conducted a study involving 53 pairs of intestinal stoma patients after colorectal cancer surgery within 6 months and their caregivers. They found that depression and fatigue experienced by both patients and their caregivers had a reciprocal influence on each other's quality of life.[13] In another study, Li et al surveyed 77 older individuals with an intestinal stoma and identified psychological, energy deficiency, digestive system, and pain symptom clusters as the main symptom groups affecting patients' quality of life, with a decline in quality of life observed with an increase in symptom severity.[14]

From these studies, it can be seen that intestinal stoma odor and pouch ballooning contribute to psychological distress in patients and a decline in their quality of life.

Intervention Strategies for Intestinal Stoma Odor and Pouch Ballooning

To mitigate the impact of intestinal stoma odor and pouch ballooning on patients' quality of life, Shao et al investigated the effectiveness of implementing a family-participatory care model in a study involving 513 adult patients with an intestinal stoma. They found that this approach improved the nursing knowledge and skills of family members, reduced the occurrence of peristomal skin complications, and improved patients' overall quality of life.[15] In another study comprising 100 patients with a permanent intestinal stoma, Yan et al noted that micro-video education was effective in improving the self-care abilities of these patients as well as enhancing their quality of life.[16] The intervention in this study involved the creation of 13 health education micro-videos categorized into four sections: introductory information on intestinal stoma, stoma care techniques, mnemonic ostomy pouch replacement techniques, and motivational content. The results indicated favorable outcomes in patient education and self-management.

In a longitudinal study for assessing the continuity of care needs in 89 individuals with a permanent intestinal stoma, Luo et al found statistically significant differences in total scores for care needs and quality of life across different assessment time points, with an inverse correlation between the two variables.[17] These findings emphasize the need for healthcare providers to systematically evaluate the unmet care needs of patients at various time points and implement targeted nursing interventions to improve their quality of life. Zhang et al investigated the impact of a family-centered empowerment model in discharge planning for 119 inpatients with a preventive intestinal stoma. They reported improvements in patients' discharge readiness and overall quality of life following this intervention.[18]

Zhang et al conducted an electronic questionnaire survey involving 1053 individuals with an intestinal stoma in China and reported that the quality of life for these patients was moderate and that patients' psychosocial adaptation level was closely associated with quality of life outcomes. Implementing an integrated health education model was found to improve patients' quality of life during the treatment interval period and reduce the incidence of complications.[19] Du et al investigated the effects of precision nursing in 78 individuals with a permanent intestinal stoma following low rectal cancer surgery. They found that implementing precision nursing enhanced patients' self-efficacy and self-care ability, leading to improvements in quality of life and facilitating their earlier social reintegration.[20]

In a randomized controlled trial (RCT) involving 108 patients with an enterostomy, Ko et al found that three months after the intervention, individuals who received multimedia education exhibited significantly higher self-care ability and quality of life scores compared to those receiving routine education.[21] Similarly, Heidari-Beni et al examined the effects of multimedia education on stoma adaptation and quality of life in 135 patients with a new stoma and demonstrated that multimedia-based education resulted in higher adaptation levels and greater improvements in quality of life than traditional face-to-face teaching methods.[22]

Lin et al studied the impact of discharge teaching quality, discharge readiness, and stoma self-efficacy on the quality of life of 221 patients with a temporary intestinal ostomy following colorectal cancer surgery. They reported that discharge teaching quality indirectly influenced quality of life through three pathways: (1) the independent mediating effect of stoma self-efficacy, (2) the independent mediating effect of discharge readiness, and (3) the chain mediating effect of both stoma self-efficacy and discharge readiness.[23] These studies indicate that enhancing patients' self-efficacy is an effective strategy for improving their postoperative quality of life.

Beyond psychological and self-efficacy interventions, addressing objective factors such as ostomy leakage and odor has been found to improve patients' quality of life. Yousef et al conducted an RCT and demonstrated that lavender essential oil significantly improved aspects such as odor elimination, work performance, body image perception, stoma function, financial concerns, acceptance level, anxiety, social participation, and irritability in individuals with a permanent colostomy.[24] An alternative approach to intestinal stoma odor management is highlighted in this study. In a randomized crossover trial involving 144 patients, Ambe et al demonstrated that an 8-week use of a new digital leakage notification system (Heylo) led to significant improvements in emotional impact and patient engagement scores.[25] These findings highlight the potential of innovative technological solutions for managing ostomy leakage.

Collectively, these studies underscore the effectiveness of patient-centered interventions—such as family involvement, digital education platforms, continuity of care assessments, structured discharge planning, strategies to enhance self-efficacy, and novel methods for stoma odor management—in improving the quality of life among individuals

requiring complex care. These interventions address multiple dimensions of well-being, including physical, psychological, social, and systemic aspects. When implemented in combination, they establish a comprehensive support framework that yields greater improvements in outcomes—such as physical comfort, emotional resilience, and social participation—compared to isolated or single-component strategies. The accumulated evidence supports the integration of these multifaceted approaches into standard care protocols to optimize patient-centered outcomes.

Discussion

Intestinal stoma surgery has a considerable impact on patients' quality of life, affecting various domains, including physiological, psychological, and social functioning. It has been noted that negative emotional states and a decline in overall quality of life is frequently observed in individuals with an intestinal stoma.[1] Key factors influencing quality of life in these patients include stoma-related complications, limited self-care ability, negative body image, and disruptions in social and sexual functioning, among others.[26]

To improve quality of life, the following intervention strategies have been adopted in current clinical practice: 1) strengthening perioperative health education to improve patients' self-care abilities; 2) implementing psychological interventions to facilitate psychological adaptation; 3) providing continuous care and social support; 4) utilizing advanced ostomy products and nursing techniques; and 5) developing individualized and multi-modal comprehensive intervention plans. These interventions have been shown to have varying degrees of effectiveness in improving patients' physiological function, psychological well-being, and social adaptation, thereby contributing to enhancing their overall quality of life.

Identifying the determinants of quality of life in individuals with an intestinal stoma and refining intervention strategies should be the focus of future research, especially for specific populations such as older individuals and those with permanent ostomies. Developing personalized interventions tailored to their unique needs will be essential in promoting comprehensive rehabilitation and long-term well-being.

Odor and pouch ballooning are important factors influencing the quality of life of patients with an intestinal stoma. It has been consistently demonstrated in research that intestinal stoma has a substantial impact on patients' physiological, psychological, and social functioning. To mitigate these challenges, various intervention strategies have been developed, including multimedia education, micro-video motivational nursing guidance, use of lavender essential oil, digital leakage notification systems, and so on. These approaches have provided valuable evidence for clinical practice, helping to formulate more effective management strategies for improving the quality of life of patients with an intestinal stoma. In future research, the development and efficacy of individualized intervention programs should be further explored while addressing the specific needs of vulnerable populations (such as older individuals and those with disabilities) to ensure comprehensive improvements in stoma-related care.

Conclusion and Prospects

Stoma odor and pouch ballooning problems have significant impacts on patients' physiological, psychological, as well as social functioning and are among the main contributors to reduced quality of life. Effective management of these issues is crucial for improving patient outcomes. Targeted educational interventions, self-care training, psychological support, and other comprehensive measures have been shown to enhance patients' self-care abilities and overall quality of life. In particular, high-quality discharge education and continuity of care play important roles in sustaining long-term improvements in the quality of life of patients. Emerging intervention strategies, such as multimedia education and micro-video motivational nursing, have been shown to have considerable potential in stoma care, providing innovative solutions and ideas for further intervention development.

Several challenges persist in improving the quality of life of patients with an intestinal stoma. Moving forward, several key areas require further investigation: There is a need to further explore the underlying mechanisms by which stoma odor and pouch ballooning affect quality of life, providing a theoretical foundation for developing more targeted intervention measures. The effectiveness of novel intervention strategies should be rigorously evaluated, with an emphasis on assessing their long-term benefits to determine the most optimal intervention approaches. Furthermore, research on individualized intervention programs should be emphasized, including developing personalized intervention

plans based on patients' specific characteristics, ensuring tailored and patient-centered care. Interdisciplinary collaboration should be strengthened, integrating insights across multiple disciplines such as medicine, nursing, psychology, and sociology to develop more comprehensive and effective intervention strategies.

More effective intervention measures need to be developed in the future through continued research and innovation to further improve the quality of life for patients with intestinal stoma, facilitating better adaptation to living with a stoma and supporting their reintegration into society.

Data Sharing Statement

The datasets used or analysed during the current study are available from the corresponding author Peng Chen on reasonable request.

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Disclosure

The authors declare that they have no conflicts of interest regarding this work.

References

1. Yan H, Su Y, Wang L. Impact of ahmadi continuing nursing model on self-care ability, stoma complications and quality of life of colostomy patients. *BMC Gastroenterol*. 2024;24(1):421. doi:10.1186/s12876-024-03497-0
2. Li SQ, Luo CL, Qiu H, Liu YX, Chen JM. Effect of Orem's self-care model on discharge readiness of patients undergoing enterostomy: a randomized controlled trial. *Eur J Oncol Nurs*. 2024;70:102549. doi:10.1016/j.ejon.2024.102549
3. Yang S, Park JW, Hur H, et al. Development of a home health care service platform for ostomy patient management. *Ann Coloproctol*. 2024;40(1):36–43. doi:10.3393/ac.2022.00360.0051
4. Crumley C. A breath of fresh air: odor management to maintain patient dignity: a view from here. *J Wound Ostomy Continence Nurs*. 2021;48(4):359–361. doi:10.1097/WON.0000000000000777
5. Meacham A, Gowans P, Bradley-Clarke J, Swearingen A, Lord S. Effectiveness of malodor-reducing ostomy pouch additives: an assessment of odor intensity, hedonic tone, and odor character. *Cureus*. 2024;16(7):e65172. doi:10.7759/cureus.65172
6. Çelik Gülden K, Seçil T. Colostomy may offer hope in improving quality of life: a phenomenological qualitative study with patients dependent on a wheelchair. *Qual Life Res*. 2023;32(7):1981–1989.
7. Wiktoria P, Katarzyna Z, Mariola C, Violetta S. Quality of sex life in intestinal stoma patients—a literature review. *Int J Environ Res Public Health*. 2023;20(3). doi:10.3390/ijerph20032660
8. Chrobak-Bień J, Marciniak A, Kozicka I, et al. Quality of life in patients over age 65 after intestinal ostomy creation as treatment of large intestine disease. *Int J Environ Res Public Health*. 2023;20(3):1749. doi:10.3390/ijerph20031749
9. MacDonald S, Wong LS, John-Charles R, McKee T, Quasim T, Moug S. The impact of intestinal stoma formation on patient quality of life after emergency surgery-A systematic review. *Colorectal Dis*. 2023;25(7):1349–1360. doi:10.1111/codi.16603
10. Robitaille S, Maalouf MF, Penta R, et al. The impact of restorative proctectomy versus permanent colostomy on health-related quality of life after rectal cancer surgery using the patient-generated index. *Surgery*. 2023;174(4):813–818. doi:10.1016/j.surg.2023.06.033
11. Abed EMM, Abo EAB, Hassan EH. Relationship between resilience and health-related quality of life among patients with a permanent colostomy. *Br J Nurs*. 2022;31(6):S4–S12. doi:10.12968/bjon.2022.31.6.S4
12. Zimeng C, Cuifen Z, Caihong Z, Liang L, Jiali W. Effect of cognitive behavioral combined with information support intervention on benefit finding and quality of life in early patients with enterostomy. *Chin Nurs Res*. 2023;37(23):4346–4351.
13. Jingi LIU, Bei ZHU, Qing WEI, Shuhong LYU. Actor-partner effects of depression and fatigue on quality of life in patients with enterostomy and their caregivers. *Chin Mental Health J*. 2022;36(04):313–318.
14. Li S, Zhong L, Zhou D, Zhang X, Liu Y, Zheng B. Predictors of psychological distress among patients with colorectal cancer-related enterostomy: a cross-sectional study. *Adv Skin Wound Care*. 2023;36(2):85–92. doi:10.1097/01.ASW.0000911012.63191.4c
15. Shao L, Lv L, Zheng MC, Huang MR, Zhang JE. Adaptation and psychometric evaluation of the Stoma-QOL questionnaire among Chinese rectal cancer patients with colostomy. *Int J Nurs Pract*. 2022;28(4):e13045. doi:10.1111/ijn.13045
16. Yan Q, Li Y. Micro video incentive nursing intervention improves the psychological state and quality of life in patients with rectal cancer after enterostomy. *Am J Transl Res*. 2023;15(3):2040–2048.
17. Luo X, Wang Y, Lu Z, Xu R. The application of continuous nursing in patients with enterostomy is beneficial to improve self-care ability, quality of life and reduce the incidence of complications. *Minerva Surg*. 2024;79(2):256–258. doi:10.23736/S2724-5691.21.09331-X

18. Zhang X, Gao R, Lin JL, et al. Effects of hospital-family holistic care model on the health outcome of patients with permanent enterostomy based on the theory of 'Timing It Right' [published correction appears in J Clin Nurs. 2021 Oct;30(19-20):3052.]. *J Clin Nurs*. 2020;29(13–14):2196–-2208. doi:10.1111/jocn.15199
19. Zhang Y, Xian H, Yang Y, Zhang X, Wang X. Relationship between psychosocial adaptation and health-related quality of life of patients with stoma: a descriptive, cross-sectional study. *J Clin Nurs*. 2019;28(15–16):2880–2888. doi:10.1111/jocn.14876
20. Du X, Yang Y, Wang L, Tan BB. Effects of microvideo-based health education on stoma self-care ability and quality of life in patients with permanent enterostomy. *J Nurs Sci*. 2021;36(16):47–49.
21. Ko HF, Wu MF, Lu JZ. A randomized control study: the effectiveness of multimedia education on self-care and quality of life in patients with enterostomy. *Int Wound J*. 2023;20(10):4244–4252. doi:10.1111/iwj.14326
22. Heidari-Beni F, Esmaeilian S, Yousefi F, Zarei MR, Farahani MA. Comparison of face-to-face education and multimedia software education on adjustment of patients with intestinal ostomy: a randomized controlled trial. *J Wound Ostomy Continence Nurs*. 2022;49(2):152–157. doi:10.1097/WON.0000000000000854
23. Lin L, Fang Y, Huang F, Zhang X, Zheng J, Xiao H. Discharge teaching quality positively predicts quality of life in colorectal cancer patients with temporary enterostomy: the mediating role of readiness for hospital discharge and stoma self-efficacy. *PLoS One*. 2024;19(7). doi:10.1371/journal.pone.0306981
24. Jumana Y, Ali AH, Suhaib O, Samar A, Aladeen A. Effects of lavender oil on odor elimination, ostomy adjustment and quality of life in patients with permanent colostomy: a randomized controlled trial. *European J Oncol Nurs*. 2023;68. doi:10.1016/j.ejon.2023.102471
25. Che AP, Elin B, Doré HH, Louise GJ, Martin V, Adeltoft AT. Effect of a novel digital leakage notification system (heylo) for ostomy care on quality of life and burden of living with an intestinal ostomy: the ASSISTER trial, a randomized controlled cross-over trial. *Mayo Clin Proceed*. 2023;1(3):438–449. doi:10.1016/j.mcpdig.2023.06.013
26. Xu YC, Wang YJ, Wang GY, Tang Y, Wu Y. A qualitative study on the causes of social alienation in patients with colorectal cancer stoma. *J Nurs Sci*. 2024;39(12):86–89.