Personal Hygiene Knowledge and Bromhidrosis Prevention Among Female Students

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Abstract - In the contemporary era shaped by K-Pop culture, beauty pageants, and the ever-expanding skincare industry, women are increasingly confronted with societal expectations of flawless appearance and pleasant body scent. Within this context, the issue of bromhidros poses not only a health concern but also a challenge to psychological well-being and social acceptance. Prior investigations have tended to focus on general hygiene practices or related dermatological conditions, leaving the relationship between personal hygiene knowledge and bromhidrosis prevention underexplored. Dormitory students are particularly vulnerable, as limited knowledge and inconsistent hygiene practices may increase their risk of developing bromhidrosis. This study sought to examine the relationship between personal hygiene knowledge and bromhidrosis prevention among female residents of X Dormitory. A quantitative correlational design was employed. A sample of 175 participants from 307 total population female student was selected using simple random sampling. Data were collected using a researcher-developed questionnaire, which was tested for validity and reliability. Statistical analysis was performed using the Spearman Rank correlation test. Results indicated that most participants demonstrated very good knowledge of personal hygiene (M = 3.30, SD = 0.42), and bromhidrosis prevention was generally in the good category (M = 3.07, SD = 0.5). A significant positive correlation was found between hygiene knowledge and bromhidrosis prevention ($r = 0.447$, $p < 0.001$), indicating a moderate positive relationship. These findings suggest that greater knowledge of personal hygiene is associated with improved bromhidrosis prevention. Future studies are recommended to employ more complex research designs and incorporate additional variables—such as lifestyle, environmental, and psychological factors—to provide a more comprehensive understanding of bromhidrosis prevention.

Keywords: bromhidrosis, female students, knowledge, personal hygiene, prevention

I. Introduction

In the contemporary era, the global spread of K-pop culture, beauty pageants, and the booming skincare industry has intensified unrealistic beauty standards that demand flawless physical appearance and impeccable personal grooming. Such standards create pressures that extend beyond aesthetics, fostering a culture of suppression and hyper-vigilance toward perceived imperfections. Although not directly linked to bromhidrosis, issues such as body odor (Octamelia & Sa'id, 2021) are framed as personal shortcomings under these rigid ideals,

thereby confronting women with significant challenges to their psychological well-being and social acceptance.

Bromhidrosis is a condition characterized by the presence of unpleasant body odor resulting from the interaction between sweat and bacteria. Sweat, particularly from the axilla and other skin areas, may undergo degradation by aerobic corynebacteria, eventually leading to bromhidrosis (Setiawan & Suling, 2018). According to Monteiro et al. (2022), bromhidrosis occurs when skin bacteria decompose apocrine sweat secretions, producing malodorous compounds such as ammonia and short-chain fatty acids. These compounds are then carried to the skin surface by two binding proteins, ASOB1 (Apocrine-Secretion Binding Protein 1) and ASOB2 (Apocrine-Secretion Binding Protein 2). Bromhidrosis can have a profoundly negative impact on affected individuals, with one of the most significant consequences being psychological distress. Social stigma, feelings of isolation, avoidance by others, and prolonged shame are among the common outcomes (Lan et al., 2022).

Prevention strategies for Bromhidrosis, as outlined by the Siloam Hospitals Medical Team (2023), include maintaining personal hygiene by bathing regularly, using antibacterial soap, thoroughly drying the body, and changing clothes frequently when perspiring. Additional measures include cleaning the axillary area, reducing axillary hair growth, paying attention to dietary intake by avoiding foods known to trigger odor such as garlic and red meat, and using deodorants or antiperspirants (Cahyono et al., 2018).

Knowledge and cognitive understanding play a crucial role in shaping individual behavior. Actions that are supported by adequate knowledge are generally more consistent and sustainable than those lacking a knowledge foundation (Adhyatma et al., 2023). Furthermore, good knowledge has been shown to enhance motivation and encourage individuals to maintain personal hygiene, highlighting the vital role of self-care in overall health Dartiwen et al. (2020). In this study, knowledge refers specifically to personal hygiene knowledge, defined as an in-depth understanding of self-care practices that maintain cleanliness and health. This includes habits such as regular bathing, brushing teeth, washing hands, caring for hair and nails, wearing clean clothing, and maintaining a healthy diet (Ghanim et al., 2016).

According to the World Health Organization (2012), the prevalence of good personal hygiene varies globally, with 60% in the United States, 72% in Sweden, 75% in Egypt, and 55% in Indonesia. Bathing habits also differ by country: in the United States, 65% of individuals bathe once daily and 21% twice daily; in the United Kingdom, 63% bathe five times per week; in France, 76% bathe seven times per week; and in Russia, 61% bathe five times per week (Tottle, 2019; World Population Review, 2024). In terms of hand hygiene, WHO (2023) reported that 64.5% of individuals practice proper hand hygiene, while Centers for Disease Control and Prevention (2024) estimated that only 19% of people worldwide wash their hands after using the toilet. Moreover, poor personal hygiene ranks third among global risk factors for morbidity in the WHO Regional Office for South-East Asia (2018).

Research among university students has also revealed low levels of personal hygiene knowledge and practice. For example, Sarlota (2023) reported that 100% of surveyed students had low knowledge of personal hygiene, with poor practices in clothing cleanliness (60%), hand and nail hygiene (56%), and bed and blanket cleanliness (88%). Similar findings were noted by Harahap et al. (2013), with clothing hygiene categorized as moderate (41.4%), but hand, nail, and bedding hygiene falling into poor categories.

Several related studies have examined the influence of knowledge on hygiene behavior. Putriana (2019) found that dormitory students demonstrated poor knowledge of personal hygiene. Sulandri et al. (2020) concluded that hygiene knowledge strongly influenced hygiene

practices, while Amalia and Pratomo (2022) showed that good knowledge was directly associated with better preventive attitudes and practices.

A preliminary study conducted by the present researchers at the X Dormitory, through observation and interviews with ten participants, further supports these findings. Of the ten students interviewed, seven reported experiencing excessive and malodorous sweating even without strenuous activity. Four of them reported infrequent bathing habits, while even among those without odor problems, two admitted irregular bathing and often only washing their faces. Furthermore, most participants reported never shaving axillary hair or using deodorants and antiperspirants. These findings illustrate not only the prevalence of inadequate personal hygiene but also the urgent need for strengthened education and awareness.

Although several studies as cited previously have explored the role of personal hygiene in relation to health outcomes, research specifically examining its association with bromhidrosis remains limited. Prior investigations have tended to focus on general hygiene practices or related dermatological conditions, leaving the relationship between personal hygiene knowledge and bromhidrosis prevention underexplored. Moreover, these specific variables have not been empirically investigated within the context of female dormitory students, a population particularly vulnerable due to communal living environments and inconsistent hygiene practices. This gap underscores the need for focused research to better understand how knowledge of personal hygiene contributes to the prevention of bromhidrosis, thereby providing valuable insights for health promotion and preventive strategies in similar settings.

The followings are the specific research questions investigated in the study:

1. What is the level of personal hygiene knowledge among female students in X Dormitory?
2. What is the level of bromhidrosis prevention among female students in X Dormitory?
3. Is there a significant relationship between personal hygiene knowledge and bromhidrosis prevention among female students in X Dormitory?

Ultimately, this study underscores the pressing need to strengthen awareness and practices of personal hygiene as a preventive measure against bromhidrosis among female dormitory students. By bridging the gap between knowledge and practice, the findings are expected to inform future educational strategies, empower students to take greater responsibility for their health, and guide institutions in fostering supportive environments that prioritize hygiene and well-being. In doing so, this research not only contributes to the body of academic knowledge but also carries practical significance for improving quality of life and promoting sustainable health behaviors. In summary, this study seeks to address an important gap in the literature by examining the relationship between personal hygiene knowledge and bromhidrosis prevention among female dormitory students. By generating both theoretical insights and practical applications, the findings are expected to contribute not only to academic discourse but also to the promotion of health, hygiene, and overall well-being within dormitory settings.

II. Literature Review

This study is grounded in the Modeling and Role-Modeling Theory (Erickson, Tomlin, & Swain) and the Self-Care Deficit Nursing Theory (Orem). The former emphasizes *self-care knowledge*, where individuals are aware of factors that compromise or promote health and growth. The latter highlights *prevention* as a core concept, focusing on mitigating the adverse effects of human conditions and life situations on development Alligood (2014). Together, these theories suggest that sufficient knowledge of disease-causing factors enables individuals to implement effective preventive measures.

One of the key concepts of the Modeling and Role-Modeling Theory is self-care knowledge. Erickson et al. (1983) state that, at a certain level, an individual knows what has caused their illness, reduced their effectiveness, or hindered their growth. Likewise, the individual also knows what will make them healthy, optimize their effectiveness or needs (under certain conditions), or promote their growth. Furthermore, Alligood (2014) explains that one of the central concepts of Orem's Theory is prevention. Orem emphasizes that prevention involves overcoming the effects of human conditions and life situations that may adversely affect human development. Thus, it is expected that when an individual has knowledge of factors that may cause illness, they will be able to carry out effective preventive measures to mitigate the impact of such conditions.

Adequate knowledge of personal hygiene is crucial for promoting health and preventing disease. Personal hygiene encompasses a variety of practices, including bathing, handwashing, hair care, oral and dental care, nail hygiene, as well as maintaining the cleanliness of bedding and towels. Regular bathing at least twice daily using clean water helps remove dirt, oil, and bacteria from the skin, thereby promoting freshness and comfort (Adiningsih et al., 2017). Hand hygiene is equally essential, with regular handwashing—particularly before meals and after using the toilet—using soap and running water for 15–20 seconds serving as an effective preventive measure (Toney-Butler et al., 2023). Hair hygiene contributes to both health and appearance and can be maintained through regular shampooing appropriate to hair type, avoiding excessive use of styling products, and consuming a balanced diet to support hair health (Muslim, 2018). Oral hygiene requires toothbrushing at least twice daily with fluoride toothpaste, combined with daily interdental cleaning and regular dental check-ups to prevent dental and periodontal disease (Frank, 2019; Prabowo, 2021). Toothbrushes should be replaced every 3–4 months to avoid bacterial contamination (Adnyasari et al., 2023). Nail hygiene involves routine trimming at least every two weeks, proper handwashing after exposure to contaminants, and ensuring nails are cut straight and not excessively short to prevent irritation or infection (Reinecke & Hinshaw, 2020; Australian Commission, 2019; Ministry of Health Republic of Indonesia, 2023). Similarly, bedding hygiene should be maintained by changing sheets, pillowcases, and blankets weekly, washing them in hot water when possible, and sunning mattresses and pillows for 4–6 hours weekly to eliminate bacteria, mites, and unpleasant odors (Bashir, 2019; Marković et al., 2019). Towels should also be replaced and washed weekly, dried under direct sunlight after each use, and never shared to minimize the spread of microorganisms (Faculty of Nursing Universitas Airlangga, 2021; Mishra & Babel, 2020). Collectively, these practices constitute fundamental aspects of personal hygiene that safeguard individual well-being and reduce the risk of infectious disease.

Bromhidrosis, derived from the Greek words ***bromos*** (foul odor) and ***hidros*** (sweat), is a condition characterized by excessive or abnormal body odor that can negatively affect an individual's professional and social interactions (Murti et al., 2019). The condition results from secretions of the apocrine sweat glands, which are primarily located in the axillae, scalp, feet, interdigital spaces, and genital regions (Anggy et al., 2024). According to Fauziah et al. (2023), bromhidrosis often reflects poor personal hygiene practices and may occur across all age groups. Conversely, a clean and well-maintained body generally does not produce unpleasant odors (Efendi, 2021).

Zehan et al. (2024) describe bromhidrosis as being marked by unpleasant or excessive body odor. Symptoms typically include increased perspiration that disrupts daily activities and noticeable changes in body odor (Pruthi et al., 2021). Individuals with bromhidrosis often experience hyperhidrosis, particularly in the axillary and genital regions, resulting in a strong odor commonly described as sour, rancid, or pungent (Hyperhidrosis Center at Thoracic Group, 2015).

Bromhidrosis frequently arises from bacterial colonization on the skin surface, particularly in areas prone to sweating, such as the axillae. These bacteria metabolize sweat into volatile, malodorous compounds (Ngan & Writer, 2021). This process is closely associated with hyperhidrosis, or excessive sweat production, which involves two types of sudoriferous glands: eccrine glands, distributed throughout the body, and apocrine glands, concentrated in regions such as the axillae and groin (Perera & Sinclair, 2013). Other contributing factors include psychological stress, poor hygiene, dietary habits, obesity, and clothing choices (Oktaviana et al., 2019). Additionally, inadequate personal hygiene may facilitate the proliferation of bacteria such as ***Staphylococcus hominis*****,** in conjunction with apocrine gland activity, thereby worsening body odor (Puspitasari et al., 2022).

Bromhidrosis is classified into two main variants—apocrine and eccrine—depending on the sweat glands involved. It can further be categorized into localized or generalized forms (Miller, 2023). **Apocrine glands** are large, branched sweat glands known for producing malodorous secretions. They are primarily located in the axillary and perineal regions, including the perianal area, labia majora in women, and the scrotum and prepuce in men (Hodge et al., 2022). **Eccrine glands** produce a clear, odorless secretion that can develop an odor once metabolized by skin bacteria. Eccrine sweat odor may also be influenced by dietary factors (e.g., garlic, alcohol) and certain medications (Roland, 2018).

Prevention of Bromhidrosis - Prevention refers to actions taken to avert or reduce the likelihood of disease, injury, or health problems at both individual and population levels (World Health Organization, 2023b). Specifically, bromhidrosis prevention focuses on reducing excessive sweating and controlling bacterial growth (Sinaga et al., 2020). Strategies include:

1. **Regular bathing** with antibacterial or antiseptic soap, particularly targeting sweat-prone areas, ideally twice daily (Soliman & Felman, 2023; Suharjana, 2022).
2. **Axillary hair removal** to reduce bacterial activity and odor persistence (Das, 2024).
3. **Use of antiperspirants,** which regulate sweat production and bacterial activity (Kurniawan et al., 2023).
4. **Clean clothing practices,** such as changing garments daily, proper washing, drying, and storage to prevent bacterial or fungal growth (Klepp & Laitala, 2023; Abney et al., 2021).

5. **Dietary regulation,** as certain foods (e.g., onions, alcohol, spicy foods) can exacerbate odor, while chlorophyll-rich foods may mitigate it (International Hyperhidrosis Society, 2024; WebMD Editorial Contributors, 2023).
6. **Adequate hydration** (≥2 liters daily), which aids in toxin elimination (Ministry of Health Republic of Indonesia, 2022).
7. **Stress management,** since stress-induced sweating contributes to odor (Felman, 2023).
8. **Vitamin B supplementation** (especially B6 and B12) to enhance metabolic efficiency, skin health, and immune function, thereby reducing odor (Maripa et al., 2020).

III. Materials and MEthods

This study employed a cross-sectional correlational design to examine the relationship between personal hygiene knowledge and bromhidrosis prevention among female students residing in X Dormitory. The study was conducted between February and March 2025.

The study population consisted of 307 female students living in the dormitory during the study period. The required sample size of 175 participants was determined using the Slovin formula at a 5% margin of error. Participants were selected through simple random sampling, utilizing a roulette wheel that contained the names of all eligible students. The wheel was spun 175 times to ensure equal probability of selection. **Inclusion criteria** were female students who were actively enrolled and residing in the dormitory at the time of the study. **Exclusion criteria** included students who declined participation or were absent during the data collection period. A total of 175 students agreed to participate, yielding a response rate of approximately 57%.

Data were collected using a researcher-developed paper-based questionnaire designed to assess knowledge of personal hygiene and practices related to bromhidrosis prevention. The instrument was reviewed by a panel of experts to ensure content validity (CVI personal hygiene = 0,83; CVI for bromhidrosis prevention = 0,91) and was pilot-tested among a group of students outside the study sample. Reliability testing indicated acceptable internal consistency (Cronbach's α for personal hygiene = 0,78; bromhidrosis prevention: 0,72). The questionnaire included both knowledge-oriented and practice-oriented items, measured on a four-point Likert scale (always, often, rare, never).

Prior to data collection, participants were informed of the study objectives, assured of confidentiality, and asked to provide written informed consent. Data collection was carried out in the dormitory setting under the supervision of the research team to ensure accuracy and completeness of responses. Completed questionnaires were coded into SPSS software, after which the original paper copies were destroyed to maintain confidentiality. Approval for this study was obtained from Faculty of Nursing Universitas Klabat with the number of 090.02/UK/FKEP/SPM/III/2025. Participation was voluntary, and students were assured of anonymity and their right to withdraw from the study at any point without penalty.

Descriptive statistics, including mean and standard deviation were used to summarize participant characteristics and responses. The relationship between personal hygiene knowledge and bromhidrosis prevention was analyzed using the Spearman Rank correlation test. A p-value of less than 0.05 was considered statistically significant.

IV. Results and Discussion

Table 1 summarizes the result of statistical analyses of the study.

Table 1. Statistical Test Results of Variables

	Item Statement	M	SD	*p*	*r*	Interpretation
Personal Hygiene Knowledge						
1.	I bathe regularly at least twice a day	3.61	0.57			Very good
2.	I use clean water	3.86	0.41			Very good
3.	I use bath soap	3.90	0.36			Very good
4.	I change bed sheets, pillowcases, and blankets at least once a week	2.81	0.81			Good
5.	I sun mattresses and pillows under direct sunlight at least once a week	2.22	0.94			Poor
6.	It is important to replace and wash towels weekly to maintain cleanliness and health	3.08	0.83			Good
7.	I hang towels to dry for 30–60 minutes after each use	3.21	0.80			Good
8.	Avoiding towel-sharing with others is important to prevent germ transmission	3.71	0.66			Very good
	Total	**3.30**	**0.42**			**Very good**
Bromhidrosis Prevention						
1.	I regularly clean and shave underarm hair	3.51	0.65			Very good
2.	I use antibacterial/antiseptic soap	3.25	0.70			Good
3.	I use antiperspirant/deodorant	2.82	1.07			Good
4.	I wear clean clothes	3.51	0.61			Very good
5.	I drink sufficient water (at least 8 glasses/day)	2.86	0.77			Good
6.	I manage stress to reduce sweat production	2.93	0.68			Good
7.	I pay attention to Vitamin B intake through food or supplements	2.63	0.73			Poor
	Total	**3.07**	**0.50**			**Good**
1.	**Relationship Personal Hygiene Knowledge and Bromhidrosis Prevention**			**.001**	**0.447**	Statistically significant

Legend: M=mean; SD=standard deviation; p = significant value; r = correlation

Based on Table 1, the level of personal hygiene knowledge among female students at X Dormitory was categorized as *very good* (M=3.30, SD=0.42). The majority of respondents demonstrated very good knowledge across essential aspects of personal hygiene. Specifically, students reported high awareness of basic practices such as bathing at least twice daily (M=3.61, SD=0.57), using clean water (M=3.86, SD=0.41), applying soap during bathing (M=3.90, SD=0.36), and avoiding towel-sharing (M=3.71, SD=0.66). These findings indicate that students not only recognize the fundamental role of hygiene in maintaining personal health but also display knowledge that aligns with established preventive health guidelines.

However, the study also identified gaps in knowledge, particularly regarding environmental hygiene. Awareness of the importance of sunning mattresses and pillows under direct sunlight at least once a week was considerably low (M=2.22, SD=0.94). This limited knowledge may have significant health implications, as inadequate sun exposure to bedding materials can facilitate the growth of microorganisms such as bacteria, fungi, and mites, which in turn may contribute to skin infections, allergies, and other hygiene-related health issues. The observed deficit suggests that while personal cleanliness practices are well understood, students are less informed about environmental factors that indirectly influence personal health.

Thus, while students have a solid theoretical understanding of personal hygiene, they have not consistently applied it in daily life. These findings align with Safutra and Rachmalia (2016), who found that most respondents (57.6%) had good knowledge of personal hygiene, and Sarlota (2023), whose study in Semarang showed that students had good skin and towel hygiene but poor mattress and blanket hygiene. Similarly, Sulandri et al. (2020) highlighted a significant relationship between personal hygiene knowledge and hygiene practices.

The results highlight that while students at X Dormitory generally possess strong knowledge of personal hygiene, specific gaps—particularly in environmental hygiene practices—remain evident. This discrepancy underscores the need for targeted educational interventions that not only reinforce individual hygiene routines but also emphasize the broader environmental factors that contribute to health outcomes. Addressing these gaps through structured programs and supportive dormitory management policies is therefore essential to translate knowledge into consistent preventive practices.

Furthermore, as presented in Table 1, the overall level of bromhidrosis prevention among female students was classified in the good category (M=3.07, SD=0.50). Respondents demonstrated very good knowledge and preventive practices in specific domains, particularly in maintaining underarm hygiene through regular cleaning or shaving (M=3.51, SD=0.65) and wearing clean clothing (M=3.51, SD=0.61). These findings indicate that students are attentive to visible and routine aspects of personal hygiene that are commonly emphasized in daily practice.

However, several preventive measures were reported at weaker levels. The use of antiperspirants or deodorants (M=2.82, SD=1.07), adequate water intake (M=2.86, SD = 0.77), and stress management (M=2.93, SD=0.68) were less consistently practiced. Of particular concern was the attention to Vitamin B intake, which was categorized as poor (M=2.63, SD=0.73). This gap may reflect a lack of awareness regarding the broader physiological and lifestyle factors contributing to bromhidrosis, as these practices are less visible, less immediate, and often require sustained behavioral commitment.

This indicates that although students have good preventive efforts overall, certain behavioral aspects need improvement. These findings align with Lestari (2016), who showed that personal hygiene significantly affects bromhidrosis prevention. Similarly, Sulandri et al. (2020) found that knowledge strongly influences hygiene-related prevention practices.

The disparity between strong performance in basic hygiene routines and weaker adherence to more complex health-related practices suggests that while students possess adequate knowledge, translating this knowledge into comprehensive preventive behaviors remains a challenge. Factors such as limited health literacy on nutrition, misconceptions about the role of deodorants, or underestimation of the importance of stress management may contribute to these inconsistencies. Addressing these gaps requires not only the provision of information but also targeted health education interventions that emphasize the interconnectedness of hygiene, lifestyle, and nutritional factors in preventing bromhidrosis.

Lastly, the results of the statistical analysis demonstrated a significant relationship between personal hygiene knowledge and bromhidrosis prevention ($p = 0.001$, $p < 0.05$). The correlation coefficient ($r=0.447$) indicates a moderate positive association, suggesting that increased knowledge of personal hygiene is associated with improved preventive practices against bromhidrosis. This finding implies that cognitive understanding of hygiene plays a contributory role in shaping health-related behaviors, although the moderate strength of the relationship also indicates that additional factors beyond knowledge may influence the effectiveness of bromhidrosis prevention.

Moreover, the significant and moderately positive correlation identified between personal hygiene knowledge and bromhidrosis prevention underscores the important role of knowledge as a determinant of health behavior. This finding aligns with Orem's Self-Care Deficit Theory, which posits that adequate knowledge is foundational to effective self-care practices. However, the moderate strength of the relationship suggests that knowledge alone may not fully account for preventive behavior. Factors such as motivation, habitual practices, social norms, and accessibility of resources (e.g., deodorants, adequate water supply, or health education) may serve as mediators in translating knowledge into consistent action. Previous studies in health behavior research have similarly demonstrated that while knowledge provides the cognitive basis for behavior, the affective and psychomotor domains—including attitudes, habits, and skills—play equally crucial roles in sustaining preventive practices. This implies that educational interventions aimed at increasing awareness of personal hygiene, though necessary, may be insufficient if not accompanied by strategies to reinforce behavior change through practical training, supportive environments, and consistent feedback. Consequently, the integration of knowledge-based health promotion with behavioral reinforcement approaches may be more effective in ensuring sustainable bromhidrosis prevention among students. The findings are also supported by research from Ariani et al. (2019), which states that adequate knowledge about hygiene and health significantly influences preventive practices related to body odor and infections.

V. Conclusion

Knowledge of personal hygiene among female students at X Dormitory, was found to be at a *very good* level. However, certain aspects still need improvement, particularly practices such as changing bed sheets, pillowcases, and blankets at least once a week, and regularly sun-drying mattresses and pillows under direct sunlight at least once a week.

Prevention of bromhidrosis among female students at X Dormitory was generally categorized as *good*. Nonetheless, preventive efforts requiring improvement include the use of antiperspirants or deodorants, wearing clean clothing, maintaining adequate water intake, managing stress, and paying attention to vitamin B consumption.

There is a significant positive relationship between knowledge of personal hygiene and the prevention of bromhidrosis among female students at X Dormitory. The relationship strength was moderate, indicating that the higher the level of knowledge, the better the bromhidrosis prevention practices.

These results underscore the importance of strengthening health education initiatives within dormitory and university settings. Practical implications include the need for continuous hygiene education among students, structured health promotion programs by dormitory management, and integration of personal hygiene into the broader educational curriculum. For future research, expanding to more complex designs and incorporating additional lifestyle, environmental, and psychological factors will provide a more comprehensive understanding of bromhidrosis prevention.

AUTHORS' CONTRIBUTIONS

Chrisna worked on conceptualization, methodology, investigation, data analysis, and writing (original draft). Nova did the supervision, contribute in data analysis, revision and writing final manuscript for research article.

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