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学位論文内容の要旨

博士の専攻分野の名称：博士（保健科学）　　氏名： Md Nahid Uz Zaman

学位論文題名

Socio-cultural and Water, Sanitation, and Hygiene Factors Affecting Menstrual Health and Hygiene Among Nursing Students in Bangladesh

（社会文化、水・サニテーション・衛生が
バングラデシュにおける看護学生の月経保健衛生に及ぼす影響）

Menstrual Health and Hygiene (MHH) is essential for women's health, dignity, education, and economic participation. However, many knowledge and support gaps still exist across different stages of women's lives. Adult women in workplaces and young women training to become health professionals often face significant MHH challenges. In Bangladesh, these issues are especially serious among nursing and midwifery students. Although global attention mostly focuses on adolescent girls, much less is known about the menstrual experiences of adult women and health-professional students. To address these gaps, this thesis had five goals. First, it reviewed global evidence on MHH challenges for adult women. Second, it examined how parents' education levels, embarrassment around menstruation, and the sanitation facilities affected menstrual product choices. Third, it explored menstrual information, product access, and disposal problems that lead to period poverty. Fourth, it identified gendered barriers through mixed-methods research on menstrual knowledge, product access, and Water, Sanitation and Hygiene (WASH) conditions. Fifth, it tested a participatory education program to improve menstrual Knowledge, Attitudes, and Practices (KAP). Together, these studies show the key factors, emotional burdens, and inequalities that shape MHH for nursing students in Bangladesh.

Five complementary methodological approaches were implemented. First, a narrative review of 205 publications (2015–2024) was conducted using systematic database searches and thematic analysis. Second, a cross-sectional questionnaire survey of 366 female nursing students from seven government nursing colleges across three regions of Bangladesh used structured instruments and multivariable logistic regression. Third, a qualitative study with 35 female nursing students employed thematic analysis of focus group discussions and in-depth interviews. Fourth, a convergent mixed-methods study combined a quantitative survey of 370 female nursing students with six focus group discussions involving 21 male and 21 female students, applying multivariable logistic regression and thematic analysis. Fifth, a quasi-experimental pre–post six-month intervention study among 384 students (192 intervention, 192 control) evaluated a four-

week participatory educational program adapted from WaterAid's training guide. Data were collected using validated KAP tools, and paired and independent t-tests assessed changes in KAP. Across all studies, ethical approval and informed consent procedures were ensured, with statistical significance set at $P < 0.05$.

The five studies reveal interconnected structural, social, economic, and gendered barriers to MHH at individual, institutional, and national levels. The narrative review, demonstrated persistent global gaps in knowledge, stigmatizing norms, unaffordable menstrual products, and inadequate WASH infrastructure throughout adulthood, notably within workplaces where inadequate privacy and disposal facilities in bathrooms contribute to absenteeism**.** The cross-sectional study, found that parental education levels, particularly maternal and paternal schooling, significantly influenced product choices, with lower parental education, embarrassment in purchasing pads, and poor bathroom privacy strongly predicting the use of unhygienic materials such as old cloths (AOR range 2.86–2.92). The qualitative inquiry, highlighted fear and confusion during menarche, persistent embarrassment in purchasing menstrual products, economic barriers, and widespread dissatisfaction with disposal facilities in educational institutions and outside home. Students reported hiding materials, restricting mobility, and experiencing emotional distress due to stigma and lack of supportive information. The mixed-methods study, revealed significant disparities in MHH indicators by income level, maternal education, program level, and rural–urban background. Qualitative insights underscored gender-sensitive issues: male students expressed both limited awareness and empathy, while female students described ongoing shame, discomfort, and the burden of managing menstruation in inadequate WASH settings. The educational intervention, demonstrated substantial improvements among intervention participants: menstrual knowledge increased, attitudes shifted toward normalization of menstruation, and hygienic practices including pad use, timely product changes, and handwashing improved significantly. Overall, findings from this thesis both confirm international patterns and provide novel insights into the experiences of nursing students a group crucial to future healthcare delivery.

MHH is a multidimensional issue shaped by knowledge gaps, gendered social norms, economic inequalities, and systemic infrastructural deficiencies. Adult women in workplaces and young women in nursing colleges face overlapping challenges rooted in stigma, limited autonomy, and insufficient institutional support. The quantitative findings demonstrate the influence of socio-demographic determinants, especially parental education levels, embarrassment on product purchase, and sanitation facilities affects menstrual products such as single use pads and old clothes. The qualitative data illuminate lived experiences of menstrual shame, secrecy, and inadequate WASH infrastructure. Mixed-methods findings also highlights emotional burdens, gendered norms, and limited awareness. The educational intervention demonstrates that even within resource-constrained environments, structured, participatory learning can significantly strengthen menstrual knowledge, reduce stigma, and promote hygienic practices, reinforcing the cognitive–affective–behavioral model of learning. Integrating MHH into nursing curricula is essential not only for students' well-being but also for preparing future health professionals who will educate communities, advocate for menstrual dignity, and contribute to gender-equitable health systems. Collectively, this thesis advances evidence-based recommendations for improving MHH through policy reform, parental and community engagement, infrastructure investment, and integration of MHH into health professional education.