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*Original Research*

# Turkish Adaptation, Reliability, and Validity of the SAMANTA Questionnaire for Non-Pregnant Women of Reproductive Age

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**Abstract**

**Background**: Heavy menstrual bleeding (HMB) significantly impacts women's quality of life (QoL). However, despite the high prevalence of HMB, culturally adapted screening tools remain scarce in Turkey. This study aimed to adapt and validate the SAMANTA questionnaire for non-pregnant Turkish women of reproductive age. **Methods**: This two-stage methodological study was conducted between January and June 2023. The adaptation process involved translating the SAMANTA questionnaire and culturally aligning it to Turkish healthcare practices. Psychometric testing was conducted on 148 women aged 18–45 years recruited from outpatient gynecological services at a tertiary care institution. Reliability was assessed through internal consistency (Cronbach's alpha) and test-retest reliability (intraclass correlation coefficient, ICC). Validity was evaluated by examining correlations between questionnaire scores and external measures of HMB severity and QoL. **Results**: The Turkish SAMANTA questionnaire exhibited satisfactory internal consistency, reflected by a Cronbach's alpha of 0.713, and an ICC of 0.668, reflecting moderate reproducibility across the test-retest assessment. Significant correlations with external measures, including HMB severity (r = 0.762), supported its criterion validity. Over half of the participants (50.7%) scored $\geq$3, indicating the presence of HMB symptoms. Responses highlighted the substantial impact of HMB on daily activities, emotional well-being, and social engagement. **Conclusions**: The Turkish SAMANTA questionnaire represents a reliable and culturally appropriate tool for screening HMB. The straightforward design and cultural adaptation make the Turkish SAMANTA questionnaire suitable for identifying women who may require further clinical evaluation. Future research should explore its utility in various clinical contexts, including primary care, and community health initiatives.

**Keywords:** heavy menstrual bleeding; SAMANTA questionnaire; quality of life; Turkish adaptation; reliability; validity

## 1. Introduction

In the gynecological patient, features of heavy menstrual bleeding (HMB) include (1) a subjective complaint of significant menstrual blood loss (MBL) resulting in impaired quality of life (QoL) across not only physical but also emotional, social, and economic domains; (2) an objective measurement indicating MBL greater than 80 mL per cycle or bleeding above the 95th percentile of the women with similar clinical features; (3) association with anemia, evidenced by hemoglobin levels falling below 10 g/dL; and (4) classification as a prominent symptom presenting in nonpregnant women of reproductive age within the broader spectrum of abnormal uterine bleeding (AUB) [1–5]. HMB can primarily be a consequence of structural or functional disturbances within the reproductive system, but it may also be linked to structural and functional ailments of other bodily systems. The exact global prevalence of HMB varies from 4% to 51% across different countries and racial groups, with estimates suggesting that approximately one-third of reproductive-age women experiences HMB [1,3]. Research in Turkey reveals that around 37.9% of reproductive-age women experience HMB, a condition closely linked to anemia and significant reductions in QoL [6–8]. Furthermore, among Turkish women who underwent surgery for abnormal uterine bleeding, HMB-related symptoms were reported in 26.6% as hypermenorrhea and 14.4% as menorrhagia, particularly in multiparturients, highlighting the substantial burden of this condition in the Turkish healthcare system [6–9].

The discrepancy in HMB prevalence reports is attributable to underreporting, stemming from both patients' limited recognition and inconsistent reporting protocols among healthcare professionals. Cultural and societal norms significantly influence patient reporting behavior and medical consultation patterns, with less than half of women suffering from HMB seeking medical consultation [3,10]. While various assessment tools exist, including the Menorrhagia Multi-Attribute Scale (MMAS) [11] and Pictorial Blood Loss Assessment Chart (PBAC) [12] as well as the alkaline hematin method [3], each has limitations in clinical settings. Recently, the SAMANTA questionnaire, a 6-item screening instrument developed in Spain, has shown considerable success in classifying women with HMB, demonstrating strong correlation with Visual Analog

Scale scores for both bleeding intensity and impact on daily activities [3,13]. In Turkey, the clinical issue for HMB is marked by a significant gap in screening and predictive diagnostics [14]. While HMB is a common condition, often leading to secondary health issues such as anemia, the lack of specific tools for its assessment complicates its effective management.

The existing methods for evaluating HMB in Turkey are not designed to address the unique aspects of this condition, particularly in terms of screening and predicting its presence and severity and its moderating effects on QoL. The SAMANTA questionnaire was chosen for Turkish adaptation due to its validated sensitivity (86.7%) and specificity (89.5%) in measuring MBL impact on QoL, its concise 6-item structure optimized from 46 initial items, its proven responsiveness to treatment changes, and its strong correlation with both patient-reported outcomes and clinical assessments [10,13,15]. This deficiency underscores the necessity for a specific, culturally adapted diagnostic tool like the SAMANTA questionnaire. This study aimed to develop a culturally and linguistically appropriate Turkish version of the SAMANTA questionnaire, ensuring its reliability and validity as a diagnostic tool for HMB. By addressing the unique cultural and medical aspects of the Turkish population, this research sought to fill the gap in effective HMB screening and diagnostics, ultimately improving gynecological care and patient outcomes in Turkey. The adaptation of the SAMANTA questionnaire to Turkish healthcare practices involved a meticulous process of translation, cultural adaptation, and validation to ensure its effectiveness in accurately identifying and predicting HMB.

## 2. Materials and Methods

This study employed a two-stage methodological and observational approach to culturally and linguistically adapt the SAMANTA questionnaire for use in the Turkish context and to comprehensively examine its psychometric characteristics, including reliability and validity. The two stages of the study included translation and cross-cultural adaptation, followed by psychometric testing. The methodological framework was adapted from our prior research on the Turkish adaptation of the antenatal risk questionnaire-revised [16], ensuring consistency with established protocols while incorporating adjustments tailored specifically to the SAMANTA questionnaire. The translation and cross-cultural adaptation process adhered to standard steps. These steps included forward translation by bilingual experts, synthesizing translations to resolve inconsistencies, backward translation into English, and a review by a multidisciplinary expert panel. Additionally, a pilot study was conducted to refine the pre-final Turkish SAMANTA questionnaire based on feedback from participants. Specific adaptations were made to culturally sensitive items, such as those addressing "social gatherings and leisure-time plans", to ensure their relevance for Turkish women.

Psychometric testing was carried out with a sample of 148 adult women aged 18–45 years who applied to an outpatient gynecological service at a tertiary care institution between January and June 2023. Reliability was assessed through a test-retest analysis involving 30 participants, who completed the questionnaire twice with a two-week interval. Validity was evaluated using exploratory and confirmatory factor analyses, and internal consistency was measured with Cronbach's alpha. The sample size was calculated to meet the requirement of 20 participants per scale item, with additional participants recruited to account for potential attrition.

The study adhered rigorously to the ethical standards set forth in the Declaration of Helsinki [17]. The study protocol, including both pilot and main study phases, received approval from the Human Ethics Committee of the University of Health Sciences (Ethical approval number 20/3 and dated December 1, 2023). The original authors of the SAMANTA questionnaire granted permission via email for its translation, cultural adaptation, and validation in Turkish.

### *2.1 Study Instruments*

#### 2.1.1 Personal Data Form (PDF)

The PDF collected demographic and health-related data of the participants as follows: age, educational status, occupational status, marital status, body mass index (BMI), chronic diseases, pregnancy, parity, previous mode of delivery, time since last birth, and age at menarche (Table 1).

#### 2.1.2 Menstrual Symptom Assessment Form (MSAF)

Compiled by researchers through a comprehensive literature review, the MSAF contained 20 questions specifically designed to evaluate HMB conditions related to the menstrual cycle (Table 2). Using a visual analogue scale (VAS), we obtained two scores, namely HMB-VAS and VAS-Menses (VAS-M). HMB-VAS was a self-reported measure of HMB, calculated from responses to questions 18 and 19, which address the severity of bleeding and its impact on daily life, respectively, using a 1–10 visual analogue scale. VAS-M was a self-reported measure of maximum menstrual pain intensity, obtained through a 1–10 visual analogue scale rating in response to question 17.

#### 2.1.3 The SAMANTA Questionnaire

The SAMANTA questionnaire is a six-question tool aimed at gathering data on the length and volume of menstrual flow, the discomfort and difficulties resulting from significant MBL, and its effect on everyday activities [13]. The questions are structured as follows: "(1) Do you experience menstrual bleeding for more than 7 days per month? (2) Do you experience 3 or more days of heavier menstrual bleeding during your menstrual period? (3) In general, does menstruation bother you due to its abundance? (4) During any of these heavier menstrual bleeding days, do you spot

your clothes at night; or would you spot them if you did not use double protection/did not change your clothes during the night? (5) During these heavier menstrual days, are you worried about staining the chair, sofa, etc.? (6) In general, during these heavier menstrual bleeding days, do you avoid, as far as possible, some activities, trips, or leisure-time plans because you frequently need to change your tampon or sanitary towel?" (Table 3). For a positive answer to items 1 and 3, each is scored with 3 points, whereas items 2, 4, 5, and 6 receive 1 point per item. The final score ranged between 0 and 10, with scores equal to or above 3 indicating the presence of HMB.

### *2.2 Conducting the Survey*

An online survey was created on the Google Forms platform, incorporating all questions from the research instruments. Participants were provided with preliminary information about the study through email or social media, followed by a detailed overview on the initial page of the online survey. The survey was divided into three sections: section 1, the inclusion and exclusion criteria; section 2, questions of the PDF; and section 3, questions of the MSAF and SAMANTA questionnaire, respectively. The questions of the SAMANTA questionnaire in the survey were organized as in the paper-based form. To ensure ethical participation, participants who agreed to participate in the study were prompted to formally acknowledge their informed consent by clicking an 'I consent' button prior to continuing with the survey.

The survey was designed with participant flexibility and autonomy in mind. Respondents were free to skip any item, except for those pertaining to informed consent, without affecting their ability to complete the questionnaire. Furthermore, participants were explicitly informed of their right to withdraw from the study at any point. Participants were provided with the researcher's telephone number and email address to obtain any desired information related to the research. All data were de-identified to protect participant confidentiality. No personally identifiable information was retained.

### *2.3 Participants*

In this study, the eligibility and ineligibility conditions were meticulously established to ensure the selection of a representative cohort of women for the evaluation of the Turkish SAMANTA questionnaire. The inclusion criterion was women aged 18–45 years. Exclusion criteria included women presenting for gynecological care due to AUB or HMB; women diagnosed with uterine structural disorders or anomalies; women using levonorgestrel intrauterine devices or hormonal contraception; ongoing medical treatment for HMB; women experiencing amenorrhea or menopause; women with a history of malignancy or degenerative diseases impacting daily life; pregnancy or childbirth within the past six months and continuing breastfeeding; women with psychiatric disorders affecting decision-making abilities; women on medication that could alter bleeding patterns, such as antiplatelet agents and/or anticoagulants. These criteria were designed to ensure a homogeneous and typical Turkish clinical population, excluding factors that could confound the assessment of HMB through the adapted SAMANTA questionnaire.

### *2.4 Statistical Analysis*

The survey data were assessed using "IBM SPSS v26 (IBM Corp., Armonk, NY, USA)". Descriptive statistics were employed to characterize the sociodemographic and clinical features of the sample. A $p$-value below 0.05 was considered statistically significant for all inferential statistical tests.

#### 2.4.1 Reliability Analysis

The reliability of the Turkish SAMANTA questionnaire was evaluated using standard psychometric methods, following the methodological framework established in prior research on scale adaptation [16]. Internal consistency was assessed using Cronbach's alpha, which measures the homogeneity of items within the scale; a value of $\alpha > 0.70$ was considered acceptable. Test-retest reliability, evaluating the stability of responses over time, was examined through intraclass correlation coefficients (ICC) using a two-way mixed-effects model, with ICC values categorized as $<0.50$ = poor, 0.50–0.75 = moderate, 0.75–0.90 = good, and $>0.90$ = excellent. Pearson correlation analysis was used to calculate item-total and item-item correlations, aiding in identifying items that were well-aligned with the overall scale.

#### 2.4.2 Validity Analysis

The criterion-related validity of the Turkish SAMANTA questionnaire was evaluated using methods consistent with those employed in prior research on scale adaptation [16]. For criterion validity assessment, two external measures, HMB-VAS and VAS-M, were employed as reference standards. These measures were derived from questions 18–19 and 17 of the MSAF, respectively. Pearson correlation analysis was conducted to assess the relationship between the scores of SAMANTA questionnaire and HMB-VAS and VAS-M, providing evidence of its criterion-related validity.

#### 2.4.3 Analyses of Ceiling and Floor Effects

The evaluation of floor and ceiling effects for the Turkish SAMANTA questionnaire followed methodologies established in prior research on scale adaptation [16]. Floor effects, defined as the proportion of participants obtaining the lowest possible scores, and ceiling effects, representing the highest possible scores, were assessed to determine the distribution of responses. Consistent with standard practices, the threshold for identifying these effects was set at

15% of the sample. If more than 15% of respondents scored at the minimum or maximum levels, this was considered indicative of floor or ceiling effects [18].

**Table 1. Descriptive characteristics of participants (n = 148).**

| Characteristics | Values |
|---|---|
| Age (years) | 30.9 (18–45) |
| Educational status | |
| Pre-high school | 2 (1.4%) |
| High school | 10 (6.8%) |
| Higher education | 136 (91.9%) |
| Occupational status | |
| Housewife | 10 (6.8%) |
| Unemployed | 10 (6.8%) |
| Employed | 100 (67.6%) |
| Student | 28 (18.9%) |
| Marital status | |
| Married | 87 (58.8%) |
| Single | 52 (35.1%) |
| Partnered | 9 (6.1%) |
| Preconception BMI (kg/m$^2$) | |
| Low | 10 (6.8%) |
| Normal | 89 (60.1%) |
| Overweight | 36 (24.3%) |
| Obese | 13 (8.8%) |
| Chronic disease | |
| Yes | 19 (12.8%) |
| No | 129 (87.2%) |
| Gravidity | |
| No | 63 (42.6%) |
| 1 | 37 (25.0%) |
| 2 | 31 (20.9%) |
| ≥3 | 17 (11.5%) |
| Parity | |
| 0 | 69 (46.6%) |
| 1 | 42 (28.4%) |
| 2 | 32 (21.6%) |
| ≥3 | 5 (3.4%) |
| Mode of previous deliveries | |
| None | 69 (46.6%) |
| Vaginal birth | 24 (16.2%) |
| Cesarean birth | 55 (37.2%) |
| Time since last childbirth | |
| No birth | 69 (46.6%) |
| 1 year ago | 13 (8.8%) |
| 2 years ago | 15 (10.1%) |
| 3+ years ago | 51 (34.5%) |
| Age at menarche | |
| Up to 10 years | 4 (2.7%) |
| 11–13 years | 106 (71.6%) |
| 14+ years | 38 (25.7%) |

Data are expressed as median (min-max) or count (%) as appropriate. BMI, body mass index; min, minimum; max, maximum.

## 3. Results

Table 1 lists the demographic profile of the 148 female participants analyzed in the study. The median age was 30.9 years, with an age range of 18–45 years, indicating a sample well within the reproductive and economically active stages of life. A substantial majority of the participants (91.9%) attained higher education, which may reflect a higher propensity for health awareness and access to healthcare resources. Regarding occupational status, 67.6% of participants were employed, while 18.9% were students, indicating a largely economically active population with potential impacts on healthcare engagement and access. In terms of relationship status, of the participants, 58.8% were married, 35.1% were single, and 6.1% were partnered. These factors may shape the social and health support systems accessible to them. From a health perspective, a majority (60.1%) of participants had a normal BMI, with 24.3% classified as overweight and 8.8% as obese, indicating a relatively healthy cohort, though with varied body weight. Concerning reproductive history, 42.6% had not had children, and of those who had, the distribution ranged from 1 child (25.0%) to 3 or more (11.5%). Furthermore, the mode of previous deliveries showed that 46.6% had no births, 16.2% had vaginal births, and 37.2% had cesarean births, indicating a diversity in delivery experiences. Finally, the time since the last childbirth revealed that a significant proportion of participants (34.5%) had their last child more than 3 years ago, potentially influencing their current gynecological health. The age at menarche further illustrated that most participants (71.6%) had their first menstruation between the ages of 11 and 13 years, aligning with typical developmental patterns.

Table 2 summarizes the findings of the MSAF. The majority (78.4%) of the participants experienced menstrual periods lasting between 5 and 7 days, reflecting standard menstrual health. Extended duration: notably, 13.5% had periods extending from 8 to 10 days, and 1.4% experienced more than 10 days, highlighting potential cases of prolonged menstruation that may need medical attention. Over half (52.0%) of the participants reported a menstrual cycle within the normal range of 21 to 28 days, and 35.1% experienced longer cycles between 28 to 35 days, suggesting variability in cycle regularity. Spotting appeared to be relatively common, with 72.8% reporting spotting occurrences, indicating possible menstrual irregularities or reproductive health issues that might require further investigation. A vast majority (81.1%) were aware of their ovulation periods, and similarly, 79.1% can predict when ovulation occurred, demonstrating a significant engagement with their reproductive health monitoring. Key symptoms reported during ovulation included watery vaginal discharge (60.8%) and lower abdominal pain (34.5%). Participants frequently reported watery vaginal discharge and abdominal pain, which are typical signs of ovulation. The high

**Table 2. Menstrual symptom assessment form (n = 148).**

| Questions | Values |
|---|---|
| Q1. How many days do your normal menstrual period last? | |
| 4 days and less | 10 (6.8%) |
| 5–7 days | 116 (78.4%) |
| 8–10 days | 20 (13.5%) |
| More than 10 days | 2 (1.4%) |
| Q2. How often do you have your menstrual cycle? | |
| Less than 21 days | 10 (6.8%) |
| 21–28 days | 77 (52.0%) |
| 28–35 days | 52 (35.1%) |
| More than 35 days | 9 (6.1%) |
| Q3. How many days was your shortest menstrual period? | |
| 2 days | 1 (0.7%) |
| 3 days | 33 (22.3%) |
| 4 days | 54 (36.5%) |
| 5 days or more | 60 (40.5%) |
| Q4. How many days was your longest menstrual period? | |
| 7 days or less | 68 (45.9%) |
| 8 days | 26 (17.6%) |
| 9 days | 16 (10.8%) |
| 10 days | 24 (16.2%) |
| 11 days or more | 14 (9.5%) |
| Q5. Please talk about any spotting on your clothes or underwear on your menstrual days? | |
| Never any staining | 40 (27.0%) |
| 1 time spotting happens | 64 (43.2%) |
| 2 or more spotting episodes | 25 (16.9%) |
| It usually happens, I don’t remember the number | 19 (12.8%) |
| Q6. If you think about your menstrual days, do they vary from period to period? | |
| No | 64 (43.2%) |
| Yes | 84 (56.8%) |
| Q7. Do you have information about your ovulation period? | |
| No | 28 (18.9%) |
| Yes | 120 (81.1%) |
| Q8. Can you usually predict when your ovulation period is? | |
| No | 31 (20.9%) |
| Yes | 117 (79.1%) |
| Q9. What body symptoms do you notice when you are ovulating? (You can choose more than one option) | |
| Watery vaginal discharge | 90 (60.8%) |
| Lower abdominal pain | 51 (34.5%) |
| Low back pain | 32 (21.6%) |
| Groin pain | 40 (27.0%) |
| Breast tenderness | 63 (42.6%) |
| I never feel pain | 16 (10.8%) |
| Other | 4 (2.7%) |
| Q10. At what times do you feel that you have sexual desire? (You can choose more than one option) | |
| Before menstruation | 62 (41.9%) |
| During menstruation | 46 (31.1%) |
| After menstruation | 47 (31.8%) |
| Other time | 38 (25.7%) |
| Q11. What methods do you use to track or calculate your ovulation period? | |
| Calendar method | 27 (18.2%) |
| Phone application | 90 (60.8%) |
| None of them | 31 (20.9%) |

**Table 2. Continued.**

| Questions | Values |
|---|---|
| Q12. How effective do you think the methods you use are in predicting your ovulation? | |
| Ineffective | 20 (13.5%) |
| Less effective | 18 (12.2%) |
| Medium impact | 70 (47.3%) |
| Very effective | 40 (27.0%) |
| Q13. Have you noticed any irregularities or changes in your menstrual cycle recently? | |
| No | 128 (86.5%) |
| Yes | 20 (13.5%) |
| Q14. Does your health or lifestyle (e.g., stress, weight changes) affect your menstrual cycle? | |
| No | 48 (32.4%) |
| Yes | 100 (67.6%) |
| Q15. Do any health problems or regular medication affect your menstrual cycle? | |
| No | 78 (52.7%) |
| Yes | 70 (47.3%) |
| Q16. How important do you think it is to better understand your menstrual cycle in order to manage your health or plan a pregnancy? | |
| Not important | 5 (3.4%) |
| Important | 46 (31.1%) |
| Very important | 97 (65.5%) |
| Q17. On a scale of 1 to 10, how would you rate the most severe pain you experienced during your menstrual period? | 5 (1–7) |
| Q18. On a scale of 1 to 10, how would you rate the severity of the amount of bleeding you experience during your period? | 5 (1–10) |
| Q19. On a scale of 1 to 10, how would you rate the extent to which bleeding during your menstrual period limits your daily activities? | 4.67 (1–10) |
| Q20. Did the type of pain in your cycles change after delivery? | |
| No | 35 (23.6%) |
| Yes, my menstrual pain has decreased | 33 (22.3%) |
| Yes, my menstrual pain has increased | 10 (6.8%) |
| I did not give birth | 70 (47.3%) |

Data are expressed as count (%) or median with range as appropriate.

reporting of these symptoms indicated a thorough understanding of bodily cues related to reproductive cycles.

Table 3 provides insights into the prevalence and impact of HMB-related experiences among 148 participants, as evaluated through the SAMANTA questionnaire. This questionnaire comprised 6 questions designed to assess the severity and impact of menstrual bleeding on daily life. What follows is a detailed analysis of the responses:

Question 1, menstrual bleeding duration: 85.8% of the participants did not experience menstrual bleeding for more than 7 days per month, and 14.2% reported bleeding for more than 7 days, indicating a potential issue with prolonged menstrual bleeding.

Question 2, days of heavier menstrual bleeding: 71.6% did not experience more than 3 days of heavier bleeding, and 28.4% did experience this symptom, highlighting a significant subset of women potentially dealing with heavier menstrual flows.

Question 3, bother due to abundant menstruation: 59.5% indicated that the abundance of menstruation does not generally bother them, and 40.5% find the abundant flow bothersome, which could affect their QoL and indicate more severe menstrual issues.

Question 4, nighttime clothing staining: 61.5% reported no incidents of staining their clothes at night due to HMB, and 38.5% would experience staining if not for protective measures, which suggests that nighttime bleeding is a concern for many, impacting sleep quality and comfort.

Question 5, concerns about staining furniture: 57.4% were not worried about staining furniture during heavy menstrual days, and 42.6% were concerned about such incidents, which points to the psychological and social stress associated with HMB.

Question 6, impact on activities: 64.9% did not feel the need to alter their activities due to menstrual bleeding, and 35.1% avoided certain activities, trips, or plans because of the need for frequent changes of sanitary products, underscoring the impact of HMB on lifestyle and social engagements.

**Table 3. Responses to the question items of the SAMANTA scale (n = 148).**

| Questions | Score | n (%) |
|---|---|---|
| Q1. Do you experience menstrual bleeding for more than 7 days per month? | | |
| No | 0 | 127 (85.8%) |
| Yes | 3 | 21 (14.2%) |
| Q2. Do you experience 3 or more days of heavier menstrual bleeding during your menstrual period? | | |
| No | 0 | 106 (71.6%) |
| Yes | 1 | 42 (28.4%) |
| Q3. In general, does menstruation bother you due to its abundance? | | |
| No | 0 | 88 (59.5%) |
| Yes | 3 | 60 (40.5%) |
| Q4. During any of these heavier menstrual bleeding days, do you spot your clothes at night; or would you spot them if you did not use double protection/did not change your clothes during the night? | | |
| No | 0 | 91 (61.5%) |
| Yes | 1 | 57 (38.5%) |
| Q5. During these heavier menstrual bleeding days, are you worried about staining the chair, sofa, etc.? | | |
| No | 0 | 85 (57.4%) |
| Yes | 1 | 63 (42.6%) |
| Q6. In general, during these heavier menstrual bleeding days, do you avoid, as far as possible, some activities, trips, or leisure-time plans because you frequently need to change your tampon or sanitary towel? | | |
| No | 0 | 96 (64.9%) |
| Yes | 1 | 52 (35.1%) |

Score 3 or above indicates that a woman may have heavy menstrual bleeding (HMB).

**Table 4. SAMANTA questionnaire score distribution.**

| Score | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Total $\geq$3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| n | 62 | 5 | 6 | 11 | 11 | 13 | 14 | 11 | 5 | 3 | 7 | 75 |
| % | 41.8% | 3.4% | 4.1% | 7.4% | 7.4% | 8.8% | 9.5% | 7.4% | 3.4% | 2.0% | 4.7% | 50.7% |

The SAMANTA questionnaire score of 3 or above is considered a supportive finding of HMB (Table 4). The responses to these questions highlight a notable proportion of participants experiencing significant issues related to HMB. This detailed analysis underlines the varied impacts of HMB on daily activities, emotional well-being, and overall QoL. A significant 41.8% of participants scored 0, indicating no symptoms of HMB. Minor scores (1 and 2) were relatively uncommon, at 3.4% and 4.1%, respectively, showing that few participants experienced mild symptoms. The scores from 3 to 10 indicate varying degrees of HMB severity. Specifically, 7.4% of participants each scored 3, 4, or 7, showing moderate levels of symptoms. Notably, scores of 5 and 6, which suggest more pronounced symptoms, were observed in 8.8% and 9.5% of participants, respectively. Scores nearing the maximum (8, 9, and 10), though less common, were reported by 3.4%, 2.0%, and 4.7% of the participants, respectively. These higher scores indicate severe symptoms that likely have a significant impact on daily activities and QoL.

### *3.1 Results of Reliability Analyses*

In assessing the psychometric properties of the SAMANTA questionnaire administered to 148 individuals, with a subset of 30 participants retested, the reliability analyses revealed several key findings. The Cronbach's alpha for the entire instrument was determined to be 0.713, indicating acceptable internal consistency. This measure of reliability was slightly lower in the retest subset, where the Cronbach's alpha was recorded at 0.696. Despite this slight decrease, the internal consistency remained within an acceptable range, suggesting that the items of the scale were reasonably homogeneous.

The test-retest reliability, measured through a correlation coefficient, was robust, with a value of 0.612. This indicates a considerable degree of stability in the scale's scores over time, confirming that the test results are consistent across different testing instances. Furthermore, the ICC was calculated to be 0.668. This high value underscores the scale's reliability. Overall, these reliability metrics collectively affirmed the scale's credibility as a consistent and dependable tool for measurement within the constructs it aimed to assess. The findings support the use of this scale for further applications and recommend its continued evaluation in diverse groups to confirm its reliability across different populations and settings.

### *3.2 Results of Validity Analyses*

While evaluating the psychometric properties of the scale, comprehensive validity assessments were conducted

**Table 5. Correlations of SAMANTA questionnaire and VAS scores for criterion-related validity analysis.**

| | Mean ± SD | HMB-VAS | VAS-M |
|---|---|---|---|
| SAMANTA questionnaire | 3.1 ± 3.2 | 0.762 ($p$ = 0. 021) | 0.527 ($p$ = 0. 047) |
| HMB-VAS | 9.7 ± 4.1 | | 0.483 ($p$ = 0. 032) |
| VAS-M | 4.7 ± 2.1 | | |

Heavy menstrual bleeding-visual analogue scale (HMB-VAS): measures severity of bleeding and its limitation on daily activities (1–10 scale). Visual analogue scale for menstrual pain (VAS-M): indicates maximum menstrual pain intensity (1–10 scale); SD, standard deviation; $p$, $p$-value.

to ascertain its accuracy in measuring the designated constructs. This analysis, encompassing both content and construct validity, involved a sample of 148 individuals. The criterion-related validity analysis for the SAMANTA questionnaire, as shown in Table 5, indicates strong correlations between the scores of SAMANTA questionnaire and VAS assessments. Specifically, the SAMANTA questionnaire score correlated highly with HMB-VAS (r = 0.762) and moderately with VAS-M (r = 0.527). This suggests that the SAMANTA questionnaire effectively captures the severity and implications of HMB as it relates to a patient's daily life and pain perception, thus validating its utility in assessing HMB.

## 4. Discussion

This research centered on establishing the psychometric properties of the Turkish version of the SAMANTA questionnaire, a dedicated instrument for quantifying HMB in non-pregnant, reproductive-age women. It was carried out in 2 primary phases: translation and cross-cultural adaptation first, and then psychometric testing was performed to assess the instrument's reliability and validity.

The translation and cross-cultural adaptation procedures commenced with two bilingual experts forward translating the original SAMANTA questionnaire into Turkish. Following this, a backward translation into English was performed to assure conceptual consistency with the source material and a synthesis of the translations. In a collaborative meeting with translators and researchers, inconsistencies between the translations were resolved. Subsequently, a panel of experts examined the pre-final Turkish version to ascertain that it culturally adapted to the Turkish populace and faithfully reflected the original scale's intent.

The demographic data revealed that the average age of the participants was 30.9 years, with a vast majority (91.9%) possessing higher education, suggesting a well-informed group that is likely proactive about health issues. Many of the participants were employed (67.6%), with a smaller segment being students (18.9%), indicating a predominantly economically active demographic. In terms of marital status, 58.8% were married, and most maintained a normal BMI of 60.1%, reflecting a general awareness of health and access to healthcare resources. The data also highlighted varied reproductive histories, indicating diverse gynecological needs within the cohort. Most of the participants reported menstrual periods lasting between 5 and 7 days. However, a notable 13.5% experienced menstrual periods extending 8 to 10 days, raising concerns about prolonged menstrual durations, although 35.1% experienced longer cycles, suggesting variability in menstrual regularity. High awareness of ovulation was reported (81.1%), with common symptoms including watery vaginal discharge and lower abdominal pain, indicating a strong engagement with their reproductive health monitoring.

Responses to the Turkish SAMANTA questionnaire revealed significant insights into the prevalence and impact of HMB. About 14.2% of the women experienced menstrual bleeding for more than 7 days per month, and 28.4% had more than three days of heavier menstrual bleeding, underscoring the burden of HMB. Furthermore, 40.5% of participants found the heavy flow bothersome, impacting on their emotional and social well-being. The HMB also led 35.1% of the women to alter their normal activities, highlighting the significant lifestyle and social engagement disruptions caused by this condition. The distribution of Turkish SAMANTA questionnaire scores showed that 50.7% of participants scored $\geq$3, indicating the presence of HMB symptoms. The scores ranged from mild to severe, with 7.4% scoring a 3, and smaller percentages reaching scores as high as 10. These higher scores, while less common, indicated severe HMB symptoms that significantly impacted daily activities and QoL. This variability in scores illustrated the diverse severity of symptoms among the participants, emphasizing the need for tailored management strategies.

The second step of psychometric testing was adaptation of the newly created questionnaire to a group of 148 women who had the ability to fill out questionnaires through Google Forms platform. Psychometric properties of the questionnaire included several statistical analyses such as Cronbach's alpha for internal consistency indices and ICCs for test-retest reliability. The responses from the participants were utilized to cross-check the efficacy of the questionnaire in terms of its capability to perceive the presence and impact of HMB. It was ensured that the translation process was as detailed as possible and provided accuracy on both linguistic and cultural aspects, and the psychometric

qualities of the instrument used for the evaluation of HMB also were preserved in the Turkish context.

The Turkish SAMANTA questionnaire proved to be a valid and sensitive tool in assessing the effects HMB had on patients' living standards and pain perceptions. The high correlation with the HMB-VAS (r = 0.762) underscores its effectiveness in assessing the severity and impact of HMB, whereas the moderate correlation with VAS-M (r = 0.527) supported its utility in evaluating pain associated with HMB. The results of the Turkish SAMANTA questionnaire proved its reliability as a tool that can be used in the clinical assessment of HMB and further recommends its broader usage in the therapeutic management of patients and in improving their health outcomes.

In a review by Perelló-Capo *et al.* [15], the current screening and diagnostic procedures of HMB and their limitations and potential improvements were discussed. The authors stated that quantitative and semi-quantitative methods used for the diagnosis of HMB fail to reflect the perception of patients and are often difficult to adapt to gynecological practice [15]. They noted that there is a need to update the tools used to screen and diagnose HMB considering patients' suffering and QoL. In particular, patient-centered tools, such as the SAMANTA questionnaire, have been considered as an important advancement in assessing both the amount of bleeding and its impact on patients' overall QoL. The findings from our study can be meaningfully contextualized within the existing literature. In alignment with Perelló-Capo *et al.* [15] observations regarding the importance of patient-centered tools in HMB assessment, our validation of the Turkish SAMANTA questionnaire demonstrated strong psychometric properties. Particularly, the high correlation we found with HMB-VAS (r = 0.762) supports the questionnaire's effectiveness in reflecting patient perception, addressing the need for tools that capture both quantitative and qualitative aspects of HMB.

Rodpetch *et al.* [19] focused on the development of a Thai version of the Menstrual Bleeding Questionnaire (MBQ) to evaluate the QoL in Thai women experiencing HMB while on oral antithrombotic therapy. They conducted a cross-sectional study to determine the prevalence of HMB among women taking antithrombotic drugs. The translated MBQ showed excellent reliability and was effective in distinguishing between women with and without HMB. The prevalence of HMB among the participants was noted to be 26.5%, indicating a significant impact on their QoL. When comparing prevalence rates, our finding that 50.7% of participants scored $\geq$3 on the SAMANTA questionnaire differed notably from the 26.5% HMB prevalence reported in Rodpetch *et al.*'s [19] Thai MBQ study. This variation might be attributed to differences in study populations and measurement tools, highlighting the importance of culturally adapted instruments. Our higher prevalence rate suggests a significant burden of HMB among Turkish women, emphasizing the need for reliable screening tools.

Period-related QoL (PERIOD-QOL), developed by Lancastle *et al.* [4], is a short measurement tool designed to assess the impact of HMB on women's QoL. This 10-item questionnaire asks how it affects women's physical, psychological, and social lives. In the study, women who reported HMB had lower PERIOD-QOL scores and thus reported a worse QoL. This tool used by health care providers supports women's decisions seeking medical help and assessing treatment effectiveness. Similar to the PERIOD-QOL developed by Lancastle *et al.* [4], our study demonstrated the SAMANTA questionnaire's capability to assess HMB's impact on women's physical, psychological, and social well-being. The finding that 35.1% of our participants reported limiting their activities due to HMB aligns with PERIOD-QOL's emphasis on QoL assessment, reinforcing the substantial impact of HMB on daily functioning.

The study by Pattison *et al.* [11] evaluated the reliability and validity characteristics of the MMAS, measuring the QoL in women with HMB. The MMAS assesses the subjective impact of menorrhagia across six domains: practical difficulties, social life, psychological well-being, physical health, work routine, and family life. The study confirmed that the MMAS possesses high validity values, as well as good Cronbach's alpha of 0.82, indicating that the items cohesively measure the construct of impact of HMB. Additionally, MMAS demonstrated moderate correlations with general QoL scales like SF-36, supporting its specificity in reflecting the unique effects of HMB. The authors suggested that MMAS is an appropriate instrument for evaluating the outcomes of HMB management. While our Cronbach's alpha of 0.713 is lower than the 0.82 reported by Pattison *et al.* [11] for the MMAS, both values indicate acceptable internal consistency. The SAMANTA questionnaire's concise 6-item structure, compared to MMAS's 6 domains, offers practical advantages in clinical settings while maintaining reliable assessment capabilities. This balance between brevity and effectiveness makes it particularly suitable for routine gynecological care in Turkey.

The study by Perelló *et al.* [3] introduced a new tool called the HMB-VAS. This tool uses two separate VASs to assess the severity of menstrual bleeding and its impact on women's QoL. The HMB-VAS has been developed as a practical tool to quickly and effectively detect HMB. The study validated this new tool in comparison with the PBAC and SAMANTA questionnaire. The results showed that the HMB-VAS had a slightly lower accuracy rate (86.8% *vs.* 87.9%) compared to the SAMANTA questionnaire. Their findings indicate that the HMB-VAS performs adequately for HMB screening and is suitable for use in gynecological care. Our findings show strong alignment with Perelló *et al.*'s [3] HMB-VAS study. The robust correlation between SAMANTA scores and HMB-VAS (r = 0.762) in our study supports the concurrent validity of both instruments

and suggests that the Turkish version effectively captures HMB severity and impact, similar to the original validation studies.

A recent study by Sinharoy *et al*. [10] aimed to assess the prevalence of HMB and its health implications in low- and middle-income countries. Conducted across Southern Asia and Sub-Saharan Africa, the research encompassed a sample of 6626 women, identifying a HMB prevalence of 48.6%. Women experiencing HMB reported a significantly higher likelihood of fatigue or shortness of breath during menses, with a risk ratio of 4.12. Adverse effects on physical health were quantified as 1.27 times worse, as per adjusted ratios. These findings underscore the substantial impact of HMB on women's QoL. The HMB prevalence of 50.7% found in our study closely mirrors the 48.6% reported by Sinharoy *et al*. [10] in their extensive study across low- and middle-income countries. This similarity suggests consistent HMB patterns across different populations and underscores its significance as a global health concern. Furthermore, our findings of substantial impact on daily activities complement Sinharoy *et al*.'s [10] observations about physical health effects, emphasizing the need for comprehensive assessment tools like the Turkish SAMANTA questionnaire.

These comparisons with existing literature validate our findings while highlighting the unique contributions of our study to the field. The successful adaptation of the SAMANTA questionnaire for Turkish populations provides a valuable tool for clinical practice, addressing the need for culturally sensitive and reliable HMB assessment instruments. The results of current study suggest that Turkish SAMANTA questionnaire maintains the strong psychometric properties of the original, while being culturally appropriate for our healthcare settings.

Research indicates that the prevalence of HMB among reproductive-age women varies significantly based on geographical location, demographics, age, parity, and study methodology [20]. Estimates suggest that 10%–32% of women experience HMB during their reproductive years. However, underreporting is common, with nearly half of those affected not seeking medical consultation for their symptoms. This may be due to misconceptions about HMB, normalization of symptoms, and a general lack of menstrual health literacy. Studies show that approximately 50% of women have limited understanding of menstruation, potentially contributing to the underreporting of HMB [21,22]. As demonstrated by DeLoughery *et al*. [23], the varying capacities of modern menstrual products significantly impact the assessment of menstrual blood loss. Accurate assessment of MBL is paramount for the diagnosis of HMB. However, the increasing utilization of modern menstrual products has rendered traditional quantification methods, primarily based on pad and tampon usage, less reliable. Clinicians must therefore consider the specific type of menstrual product used by patients and their individual usage patterns to mitigate the risk of underestimating HMB. Failure to account for these factors may lead to inadequate evaluations, potentially overlooking underlying health conditions and delaying necessary interventions. Cultural factors, including menstrual taboos, can also hinder open communication and accurate reporting. Additionally, the subjective nature of HMB assessment and variability in defining MBL can affect the precision of epidemiological data. While self-reported symptoms and their impact on QoL are crucial for understanding the burden of HMB, individual perception of MBL may not be entirely reliable [20,23].

### *4.1 Strengths of the Study*

This research study attempted by translation, adaptation, validation and to comprehend the reliability of Turkish SAMANTA questionnaire by using two-stages of the methodological approach to measure HMB among the non-pregnant female population in Turkey. The subjects were 148 women of different socio-economic statuses, and the survey was online. Among the strengths of the study were a large and highly heterogeneous participant group, the application of powerful and sophisticated statistical techniques, and the cultural adaptation of the test to the healthcare environment of Turkey. Having established the reliability and validity of the Turkish version, the SAMANTA questionnaire serves as a valuable instrument for assessing HMB in the Turkish population. The clinical management of HMB, a condition that significantly diminishes the QoL for affected women across physical, emotional, and social domains, is often complicated. This complexity stems from the difficulties inherent in accurately measuring MBL and the common mismatch between a patient's perception of bleeding and objective clinical measurements. Therefore, by enabling a tailored approach to treatment, the SAMANTA questionnaire provides clinicians with a crucial tool to address the specific needs and experiences of each patient, ultimately improving the management of HMB and potentially leading to better outcomes for those who suffer from it.

### *4.2 Limitations of the Study*

Despite the power of this study, some limitations need to be considered. An issue of the study is the possibility of self-reported data biases linked with the subjective reporting and interpretation of symptoms. Such a situation may reduce the reliability of the collected data and thus the final results of the experimental study. Additionally, the absence of women with uterine malformations or using hormonal contraceptives may limit the effective use of the outcomes across the entire group of women in reproductive age. Ultimately, translation and adaptation processes are thorough, but the subtleties of language and the meanings intrinsic to a culture can distort how questions are comprehended and answered. Those problems were reduced in the back-translation and expert review process. Such shortcomings,

however, present the scenario where the results of the research are promising, but still more research is required to authenticate them in different populations and settings of Turkey.

## 5. Conclusions

The validation of the Turkish SAMANTA questionnaire is a critical step in integrating a new tool for the HMB management by gynecologists in Turkey who encounter nonpregnant, reproductive-age women. The translation and adaptation process were laborious and involved close translation work, cultural factoring, and psychometric evaluation, which all proved the instrument's reliability and validity. The use of the SAMANTA questionnaire has been proven and demonstrated the fact that it can be a successful instrument for gynecologists and researchers to assess patient's QoL presentation, and to evaluate the severity of HMB condition.

Adaptation of the SAMANTA questionnaire into cultural congruence leads to its increased effectiveness during the early and accurate diagnosis of HMB. This is because the early procedure promotes the treatment that takes into account the region and the cultural determinants that are most typical in Turkish population. As a result, such initiative is expected to be helpful in the sense that patients will be doing better. The impactful nature of the SAMANTA questionnaire developed in Turkey, holds the potential of becoming an integral part of the equipment for improving the QoL of women and in turn helping health care providers to deliver customized and optimized care. It is of paramount importance that the researchers extend their efforts and widen the area of this implementation throughout Turkey. These interventions can, thus, form the fundamental components of exploring menstrual health within the individual cultural niche.

## Declaration of Generative AI and AI-assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT and QillBot AI in order to perform efficient proofreading, grammar checks, and enhancement of overall readability of the manuscript. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

## Availability of Data and Materials

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

## Author Contributions

MPY, AC, FYG, NC, BG, IY designed the research study. MPY and AC conducted the research. MPY, IY, ST, MC analysed the data. All authors contributed to the editorial changes in the manuscript. All authors read and approved the final manuscript. All authors participated sufficiently in the study and agreed to be responsible for all aspects of the study.

## Ethics Approval and Consent to Participate

The study protocol including pilot and main study processes was approved by the Human Ethics Committee of the University of Health Sciences (Ethical approval number 20/3 and dated as December 1, 2023). In this study, adherence to the ethical principles outlined in the Declaration of Helsinki was stringently upheld, ensuring the protection of participant rights and welfare at every stage of the research process. All subjects gave their informed consent for inclusion before they participated in the study.


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## Conflict of Interest

The authors declare no conflict of interest.

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