

Validation of the Working Ability, Location, Intensity, Days of Pain and Dysmenorrhea (WaLIDD) Scale in Arabic-Speaking Young Female Adults

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Background: Dysmenorrhea, characterized by painful menstrual cramps, significantly impacts the well-being of women globally. Despite its prevalence and adverse effects, dysmenorrhea is often underdiagnosed and inadequately treated. This study aims to validate the Arabic version of the Working ability, Location, Intensity, Days of pain, and Dysmenorrhea (WaLIDD) scale among Lebanese female university students aged 18–45.

Methods: This cross-sectional study, involving 729 participants, utilized a translated WaLIDD scale and the Depression, Anxiety, and Stress Scales (DASS-8).

Results: Confirmatory Factor Analysis (CFA) confirmed the one-factor structure of the WaLIDD scale, demonstrating excellent fit indices, with good internal reliability. Concurrent validity analysis revealed significant associations between higher WaLIDD scores and elevated levels of depression, anxiety, and stress. The prevalence of dysmenorrhea in the study was estimated at 7.3%.

Conclusion: The study underscores the importance of the WaLIDD scale as a reliable and valid tool for assessing dysmenorrhea among Arabic-speaking populations. The successful validation of the Arabic version facilitates its application in Lebanon and potentially other Arab regions, providing a universal tool to predict and assess dysmenorrhea and its impact. Further research is encouraged to explore the scale's applicability in clinical settings and tailor interventions for improved women's well-being.

Keywords: dysmenorrhea, psychometric, scale, Arabic

Introduction

Dysmenorrhea, characterized by painful menstrual cramps, is a prevalent and often debilitating condition that significantly impacts the quality of life for a substantial number of women worldwide.¹ This disorder affects 45% to 95% of women worldwide and typically lasts from 8 to 72 hours during the first and second days of menses.² In addition to the physiological impact, dysmenorrhea is a cause of absenteeism and causes an alteration in the quality of life.² Dysmenorrhea negatively affects work days and productivity, and represents one of the considerable causes of

absenteeism from work.^{1,3} Indeed, one out of three women take sick leaves during their bleeding periods.³ Dysmenorrhea has also substantial effects on life course potential, large impact on physical and mental well-being of affected females, and high levels of depression, anxiety and stress.^{1,4} It also has longstanding impairments on education/career attainment, personal relationships and quality of life.⁵ Besides, dysmenorrhea is linked to an increased risk of developing chronic pelvic and non-pelvic pain.⁶ Another study conducted by Dogan et al compared dysmenorrhea severity in two groups, the first with lifestyle changes and kinesio taping and the second with only lifestyle changes and have found that both groups experienced a decrease in the severity of dysmenorrhea, but it was more pronounced in the first group.⁷

Despite these negative effects, dysmenorrhea is viewed and accepted as a normal part of menstruation more than a disorder, and is therefore associated with a low tendency to seek help, and greater likelihood of being underdiagnosed and inadequately treated. For instance, an online clinometric study involving Brazilian women over 18 years old demonstrated that the numerical rating scale (NRS) is a valid measure for assessing dysmenorrhea-related pain intensity, supported by evidence of criterion validity, construct validity, and favorable test–retest reliability.⁸ A prevalence study in Madrid, Spain, involving 1387 women compared visual-analog (VAS)⁹ and numeric scales for assessing menstrual pain,¹⁰ revealing a high correlation between the two methods; despite some minor rating differences, both scales were considered useful.⁸

As researchers and healthcare professionals strive to better understand and address the complexities of dysmenorrhea, the need for reliable and valid measurement tools becomes paramount. In response to this imperative, the Working ability, Location, Intensity, Days of pain and Dysmenorrhea (WaLIDD) scale emerges as a promising instrument designed to comprehensively assess the multifaceted dimensions of dysmenorrhea and assess their risk for absenteeism.³ This scale has been validated in a cross-sectional study conducted among undergraduate students aged over 18, where it showed good psychometric properties.⁹ The WaLIDD demonstrated high sensitivity in Iranian adolescent girls, which means that it is able to detect the slightest increase or decrease in pain.⁹ Also, the WaLIDD was used in samples from Malaysia,¹¹ Indonesia,¹² and Arab countries (eg, Saudi Arabia,¹³ Palestine and Jordan,¹⁴ but without validation.

The existing research on menstrual health in Arab countries has been insufficient and very limited. There is no currently self-report measure of dysmenorrhea symptoms in Arabic to the best of our knowledge. Subsequently, there is a lack of epidemiological prevalence data on dysmenorrhea in Lebanon and the Arab region using a validated tool. Self-report measures offer several advantages, including easy administration and low cost, exposing their value in Arab settings. This undertaking is considered crucial and indispensable for various reasons, particularly as a validated Arabic translation of the WaLIDD score would facilitate the assessment of dysmenorrhea among diverse local populations and cultural contexts, given the widespread usage of the Arabic language worldwide. Therefore, our objective was to assess the psychometric properties of the Arabic version of the WaLIDD scale among a sample of Lebanese menstruating female adults. It was anticipated that the Arabic language version of the scale will yield a one-factor structure and will demonstrate good internal consistency as well as adequate concurrent validity.

Methods

Ethics Approval and Consent to Participate

Ethics approval for this study was obtained from the ethics committee of the School of Pharmacy at the Lebanese International University (2023RC-016-LIUSOP). Written informed consent was obtained from all subjects; the online submission of the soft copy was considered equivalent to receiving a written informed consent. This study complies with the Declaration of Helsinki.

Study Design

This cross-sectional study included 729 participants of Lebanese female university students between May 28 and August 1, 2023, aged between 18 and 45 years, and residing in all Lebanese governorates. We excluded from this study all participants that did not fall within this age interval, non-Lebanese or Lebanese not residing in Lebanon and post-menopausal women. To reach out to them, we used the snowball technique and sent the questionnaire created on the

Google Forms Software to different universities that diffused it to their students by email. The study objectives and general instructions were provided to each individual subject online prior to their participation. For taking part, no credit was given.

Minimal Sample Size Calculation

Using G power software, which was predicated on an effect size of $f^2 = 2\%$ (R^2 deviation from zero of 5%), an alpha error of 5%, a power of 80%, the minimal sample size needed is: 371 to have enough statistical power and considering 20 continuous variables incorporated in the analysis.

Questionnaire

The WaLIDD score⁹ was forward and backward translated from English to Arabic following international guidelines. We have also included the Arabic version of the depression, anxiety and stress scales (DASS-8)¹⁵ to measure depression, anxiety and stress levels. An opening page outlining the goal of the study, a declaration of participant confidentiality, and a disclaimer regarding the non-traceability of any kind of response were all included in the Arabic version of the questionnaire. There was no monetary reward, and the student was free to accept or decline involvement. The first section of the survey addressed sociodemographic variables like age, gender, governorate, family monthly income, and the house crowding index (HCI), which is a measure of socioeconomic status and is computed by dividing the total number of occupants by the total number of rooms in the house (not counting the kitchen and bathrooms). A lower socioeconomic position is reflected in a higher HCI score.

The WaLIDD Score

It is used to determine college students who suffer from dysmenorrhea and to forecast when these students would need medical leave. It comprised the four commonly used criteria—days of pain (D), intensity pain range (Wong-Baker), work ability (Wa), and anatomical region of discomfort location (L)—found in definitions of dysmenorrhea published in the literature.⁹ The translation process of the WaLIDD Scale from English to Arabic involved a meticulous forward and backward translation carried out by two professional bilingual translators. Initially, an experienced translator initiated the forward translation, converting the original English version into Arabic with a focus on linguistic accuracy and cultural relevance. Subsequently, a second translator, also proficient in both languages, conducted the backward translation by translating the English version back into Arabic. This iterative process aimed to maintain equivalence between the two language versions. Any identified discrepancies or nuances were thoroughly discussed and refined collaboratively to ensure semantic fidelity and cross-cultural validity. The collaborative efforts of these professional translators aimed to capture the nuances of the WaLIDD Scale in both languages, ensuring the integrity and accuracy of the translated instrument for use in diverse linguistic contexts.

DASS-8

The DASS-8 is a brief 8-item tool and a shortened version of DASS-21 that can be used in clinical practice and research to facilitate the detection of psychopathologies and monitor response to treatments at the symptom level of psychological distress. Higher scores indicate lower levels of psychological symptoms.¹⁶ This scale yields three scores: depression ($\omega = 0.83 / \alpha = 0.83$), anxiety ($\omega = 0.84 / \alpha = 0.84$) and stress ($\alpha = 0.72$).

Confirmatory Factor Analysis (CFA)

There were no missing responses in the dataset. We used data from the total sample to conduct a CFA using the SPSS AMOS v.29 software. As a rule of thumb, simulation studies show that with normally distributed indicator variables and no missing data, a reasonable sample size for a simple confirmatory factor analysis model is about $N = 150$,¹⁷ which was exceeded in our sample. Our intention was to test the original model of the Walidd scale (ie, one-factor model). Parameter estimates were obtained using the maximum likelihood method and fit indices. For this purpose, the normed model chi-square (χ^2/df), the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), the Tucker-Lewis Index (TLI) and the comparative fit index (CFI). Values ≤ 5 for χ^2/df , ≤ 0.05 for

SRMR, ≤ 0.08 for RMSEA, and 0.95 for CFI and TLI indicate good fit of the model to the data.¹⁸ Additionally, evidence of convergent validity was assessed, with average variance extracted (AVE) values of ≥ 0.50 considered adequate.¹⁹ Multivariate normality was verified via Bollen–Stine bootstrap $p = 0.533$.

Composite reliability in both subsamples was assessed using McDonald's ω and Cronbach's α , with values greater than 0.70 reflecting adequate composite reliability.²⁰ The WaLIDD total score was considered normally distributed since the skewness ($= -0.410$) and kurtosis ($= 0.086$) values varied between ± 1 .²¹ Therefore, to assess concurrent and divergent validity, we examined bivariate correlations between WaLIDD scores and the DASS-8 subscales scores using the Pearson test.

Results

A total of 769 participants enrolled in this study (mean age = 21.58 ± 3.20 years). Other characteristics of the sample can be found in Table 1. Moreover, the mean WaLIDD score was 6.05 ± 2.45 [min = 0; max = 12], with 56 (7.3%) participants having dysmenorrhea (WaLIDD scores > 9). The description of the answers to the WaLIDD scale's items are summarized in Table 2.

Table 1 Sociodemographic and Other Characteristics of the Participants (n=769)

Variable	Mean \pm SD
Age (years)	21.58 \pm 3.20
Household crowding index (person/room)	1.28 \pm 0.58
Body Mass Index (kg/m ²)	22.61 \pm 3.75
Physical activity index	22.28 \pm 18.00
Age at first period (years)	12.34 \pm 1.80
Depression	3.83 \pm 2.69
Anxiety	3.90 \pm 2.75
Stress	3.02 \pm 1.83
Dysmenorrhea	6.05 \pm 2.45

Table 2 Description of the Answers to the WaLIDD Scale's Items

Item 1: Number of pain sites	
No soreness at any site	64 (8.3%)
Single site	199 (25.9%)
2–3 sites	382 (49.7%)
4 sites	24 (16.1%)
Item 2: Pain intensity	
It does not hurt	55 (7.2%)
It hurts a little	229 (29.8%)
It hurts a little more	325 (42.3%)
It hurts a lot / worst pain	160 (20.8%)
Item 3: Days of pain during the period	
0	43 (5.6%)
1–2	523 (68.0%)
3–4	156 (20.3%)
5 or more	47 (6.1%)
Item 4: Frequent disruption of activities	
Never	133 (17.3%)
Almost never	346 (45.0%)
Almost always	235 (30.6%)
Always	55 (7.2%)

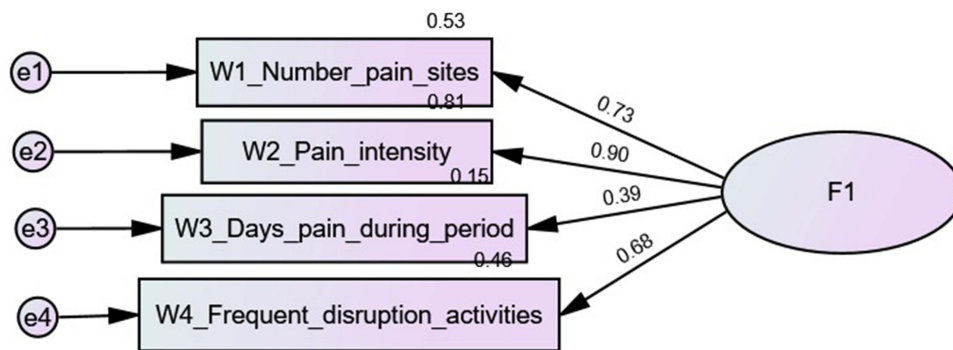


Figure 1 Standardized factor loadings of the Walidd scale items in Arabic.

Confirmatory Factor Analysis of the WaLIDD Scale

CFA indicated that fit of the one-factor model of the WaLIDD was excellent: $\chi^2/df = 1.44/2 = 0.72$, RMSEA = 0.001 (90% CI <0.001, 0.065), SRMR = 0.008, CFI = 1.000, TLI = 1.002. The standardized estimates of factor loadings (Figure 1) and the AVE value (= 0.92) were excellent. The internal consistency was good as shown by $\omega = 0.80$ and $\alpha = 0.77$ values, respectively.

Concurrent Validity

Higher depression ($r = 0.10$; $p = 0.006$), anxiety ($r = 0.11$; $p = 0.002$) and stress ($r = 0.13$; $p < 0.001$) were significantly associated with higher WaLIDD scores.

Discussion

Our contribution to the literature involves presenting the first validation of the WaLIDD scale in Arabic language, an instrument that evaluates the severity of dysmenorrhea among females of reproductive age. As anticipated, our findings indicate that the Arabic WaLIDD demonstrates good internal consistency and confirms the one-factor structure of the original version.¹⁸ The findings of this study underscore the significance of the WaLIDD Scale as a reliable and valid instrument for assessing dysmenorrhea in the context of Lebanese female adults.

The prevalence of dysmenorrhea in this study was estimated at 7.3%, which is lower than the number shown in two previous Lebanese studies that estimated the rate of dysmenorrhea higher than 80%.²² This discrepancy might be because the rate in the latter studies was estimated using a self-developed measure, and not evaluated using a validated tool. The rate in our study was also lower than the rate found in Columbia.⁹ According to a systematic review,²³ the prevalence of dysmenorrhea varies between 16% and 91%. This difference in prevalence rates can be ascribed to the absence of standardized methods for evaluating the severity of dysmenorrhea and the adoption of diverse definitions. These definitions range from occasional menstrual cramps to pain of such intensity that it disrupts daily activities and/or necessitates medications intake. Other factors contributing to this difference are usage of oral contraceptives, duration of symptom recall and the variety of reporting approaches.

The robust confirmatory factor analysis (CFA) results, indicating an excellent fit of the one-factor model, attest to the scale's structural validity. This supports the notion that the WaLIDD Scale effectively captures the multifaceted dimensions of dysmenorrhea, aligning with its utility in diverse cultural contexts. The internal reliability of the Arabic WaLIDD was higher than that of the original scale ($\alpha = 0.72$). One additional advantage of the current study lies in the utilization of McDonald's omega, a method that demonstrated greater reliability in estimating the internal consistency of psychological scales.²⁰

The concurrent validity analysis further strengthens the scale's credibility, revealing significant associations between higher WaLIDD scores and elevated levels of depression, anxiety, and stress. This aligns with existing literature suggesting the intricate interplay between dysmenorrhea and psychological wellbeing,^{6,24} establishing the evidence for the concurrent validity of the scale.

Clinical and Research Implications

This study showed that the WaLIDD score is a valid and reliable tool to assess dysmenorrhea in the Lebanese population, which carries several important research implications; the Arabic version ensures that the scale is culturally and linguistically appropriate for the assessment of dysmenorrhea in Lebanon and hopefully other Arabic-speaking populations. With a validated scale, researchers can expect more reliable and valid data regarding the severity of dysmenorrhea symptoms, which would allow better comparison between different populations. Researchers can use the validated scale to identify specific symptom profiles, which can inform the development of targeted interventions, treatments and educational programs tailored to the need of women experiencing dysmenorrhea. Researchers can use the Arabic version of the scale in longitudinal studies, aiming at investigating the long-term effects of dysmenorrhea on women's physical and mental health. Finally, by using a validated scale, researchers can raise awareness about dysmenorrhea as a significant health issue, encouraging women to seek help when needed.

Limitations

While the study presents valuable insights, certain limitations should be acknowledged. The reliance on self-reported data, common in survey-based research, may introduce information bias. Additionally, the study's cross-sectional design limits our ability to establish causation. Recruiting participants via the snowball sampling technique and the unknown refusal rate predispose us to a selection bias.

Conclusion

In conclusion, this study contributes to the growing body of knowledge surrounding dysmenorrhea assessment tools. The WaLIDD Scale, with its demonstrated psychometric properties in the Arabic context, stands as a valuable instrument for healthcare professionals and researchers alike. The successful translation and validation of the WaLIDD scale in Arabic facilitate its application in Lebanon and potentially other Arabic-speaking regions, providing a universal tool to predict and assess dysmenorrhea and its impact on the quality of life of patients without needing paramedical support or the expertise of a specialized physician. The need for culturally sensitive measurement tools is emphasized by the diverse linguistic and cultural backgrounds within the Arabic-speaking world. Further research could explore the scale's application in Arab clinical settings and can be used in further studies correlating dysmenorrhea and other region-related variables. It has as well a potential role in tailoring interventions to alleviate the impact of dysmenorrhea on women's overall well-being and potentially universally adjust the therapeutic approach in front of this disorder while adding the lifestyle modifications to the treatment plan.

Data Sharing Statement

All data generated or analyzed during this study are not publicly available due the restrictions from the ethics committee but are available upon a reasonable request from the corresponding author.

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Disclosure

The authors report no conflicts of interest in this work.

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