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Abstract: Background/Objectives: The Antepartum Depression Scale (ADS) is an innovative tool designed to comprehensively assess the psychological states of pregnant women, specifically targeting depression, melancholy, anxiety, and self-dysthymia. Unlike existing scales, the ADS integrates a multidimensional approach tailored to the unique psychological profile of pregnancy. Additionally, its adaptability for telemedicine ensures accessibility for psychological assessments via digital platforms, addressing the growing need for remote mental health care. Despite the critical importance of maternal mental health, there remains a gap in standardized, pregnancy-specific depression assessments that are both clinically robust and telemedicine-compatible. The ADS was rigorously developed and validated to ensure accuracy and reliability, making it a critical tool for early detection and management of antepartum depression, even in resource-limited settings. **Methods:** A total of 850 pregnant women participated in the ADS validation study, with 650 completing a test-retest reliability analysis over a 14-day interval. The diverse Romanian sample ensured demographic variability. Additionally, 200 participants completed the ADS alongside Beck's Depression Inventory, Hamilton Anxiety Rating Scale, and Rosenberg's Self-Esteem Scale to assess construct validity. Psychometric properties were evaluated using internal consistency, test-retest reliability, and factor analysis. **Results:** The ADS demonstrated excellent internal consistency (Cronbach's Alpha = 0.897), strong validity (The Kaiser-Meyer-Olkin = 0.876), and robust

correlations with established scales. Notably, mean depression scores increased significantly between tests, underscoring the scale's sensitivity to psychological changes during pregnancy. **Conclusions:** The ADS is a validated, multidimensional tool that fills a critical gap in maternal mental health assessment by offering a pregnancy-specific, psychometrically sound instrument. Its applicability in both clinical and telemedicine settings support's early intervention, ultimately enhancing maternal mental health care and improving outcomes for pregnant women.

Keywords: Antepartum Depression Scale (ADS); depression in pregnancy; validation and reliability; psychological assessment; early detection; maternal mental health; self-assessment tool; telemedicine adaptation

1. Introduction

Depression during pregnancy, also known as antepartum or antenatal depression, is a significant public health concern with long-term consequences for both mother and child. It is conceptualized as a state of psychological distress marked by persistent sadness, anxiety, fatigue, low self-worth, and disturbances in sleep or appetite. Theoretical models such as the biopsychosocial framework and the transactional model of stress and coping (Lazarus & Folkman, 1984) highlight how hormonal changes, perceived stress, and environmental strain can collectively exceed a woman's coping capacity during pregnancy, leading to depressive symptoms [1]. Additionally, prenatal attachment theory emphasizes that maternal emotional distress can disrupt early bonding and predict poorer infant outcomes [2]. These models collectively inform the conceptual framework for understanding antepartum depression not only as a mood disorder but also as an interaction between cognitive-emotional states and psychosocial context.

Based on these frameworks, the current study approaches antepartum depression as a multidimensional construct that includes not only classical depressive symptoms but also melancholy, anxiety, and self-dysthymia, which are frequently underrepresented in standard tools. This theoretical grounding informed the development of the Antepartum Depression Scale (ADS), designed to offer a more comprehensive and clinically sensitive measurement of maternal psychological states.

Current diagnostic tools, such as the Beck Depression Inventory (BDI) and the Hamilton Anxiety Rating Scale (HAM-A), were primarily developed for general psychiatric populations and are not tailored to the specific psychological dynamics of pregnancy [3,4]. Although the Edinburgh Postnatal Depression Scale (EPDS) addresses some aspects of perinatal mood disorders, it primarily focuses on the postpartum period and does not comprehensively assess constructs such as melancholy, self-dysthymia, or multidimensional emotional states during pregnancy [5].

Recent literature emphasizes the need for pregnancy-specific screening instruments capable of capturing a broader spectrum of emotional symptoms, particularly considering the unique hormonal, social, and psychological changes associated with pregnancy [6,7].

In response to these gaps, the Antepartum Depression Scale (ADS) was developed as a comprehensive, multidimensional tool designed to assess depression, melancholy, anxiety, and self-esteem in pregnant women. The ADS is conceptually grounded in an integrated framework that recognizes the complexity of emotional changes during pregnancy and seeks to offer a telemedicine-adaptable solution for early detection and intervention.

The ADS validation study involved robust psychometric testing, ensuring high internal consistency, construct validity, and test-retest reliability, thus providing clinicians and researchers with a targeted, reliable instrument for antepartum mental health evaluation.

The Antepartum Depression Scale (ADS) addresses the growing need for effective mental health assessment tools tailored specifically for pregnant women. Existing tools, such as the Beck Depression Inventory, often lack the sensitivity to detect the unique psychological dynamics of pregnancy [8–

13]. The ADS was developed to fill this gap, focusing on a multiscale approach by analyzing depression, melancholy, anxiety, and self-dysthymia through a multidimensional lens [14–19].

Designed for both clinical and telemedicine settings, the ADS enhances accessibility for diverse populations. Its compact structure supports remote use via mobile apps and video consultations, making it especially valuable in resource-limited settings [20–24]. By facilitating early detection, the ADS significantly contributes to improved maternal and neonatal health outcomes [25].

The construction of the ADS relied on a robust methodological foundation, combining Open-Source Intelligence (OSINT) and Human Intelligence (HUMINT). OSINT synthesized data from scientific literature, forums, and existing depression scales to identify gaps and best practices. Meanwhile, HUMINT incorporated direct feedback from clinical psychologists, perinatal health experts, and patients, ensuring the tool aligns with the real-world needs of pregnant women [8–13].

The ADS's validation process included rigorous test-retest reliability analysis and internal consistency evaluations, demonstrating strong psychometric properties. Its streamlined design, validated through comprehensive statistical methods, balances depth with practical usability. By correlating scores with key risk factors such as personal history of depression and levels of social support, the ADS provides actionable insights for intervention and treatment.

This innovative scale bridges the gap between traditional psychological assessments and the specific needs of the pregnant population. By leveraging modern technology, the ADS stands as a transformative tool in advancing maternal mental health care.

2. Materials and Methods

2.1. Participants:

The study included 650 pregnant women who were evaluated twice at two-week intervals (± one day). We collected data based on their gestational week, trimester, and whether they lived in a rural or urban environment. All participants were recruited from Romania across two distinct phases to capture a comprehensive demographic and temporal spread. The primary sample (n = 650) was collected over 18 months (June 2020 – December 2021), a period marked by heightened preventive measures and mobility restrictions due to the COVID-19 pandemic. This allowed for the assessment of antepartum mental health under unique stress conditions. A secondary sample (n = 200) was recruited between January 2022 and December 2023, after the relaxation of pandemic-related restrictions. This cohort was used specifically for the construct validity analysis, as participants completed the Antepartum Depression Scale (ADS) alongside Beck's Depression Inventory, Hamilton Anxiety Rating Scale, and Rosenberg's Self-Esteem Scale.

By spanning both pandemic and post-pandemic periods, the study captured a broader spectrum of psychosocial dynamics affecting pregnant women. The study aimed to understand the unique challenges faced by pregnant women during this period and the impact of external factors such as the pandemic on their mental and physical health.

2.2. Data Analysis

The statistical analysis was performed using SPSS version 26. Categorical variables, including demographic characteristics and levels of depression, anxiety, and, self-esteem was described using frequencies and valid percentages, expressed as numbers and percentages.

2.3. Procedure:

The study employed paper-based questionnaires administered at family medicine clinics and ambulatory outpatient services. The Antepartum Depression Scale (ADS) questionnaire comprising 45 items was utilized to gather data from participants. Participants underwent a second round of testing 14 days later (± one day) during subsequent consultations. (Monitoring and treatment primarily occurred through small centers and family doctor offices due to overcrowding in hospitals.)

Regarding correspondence among the items within other assessment tools 200 pregnant women participated and receiving the Antepartum Depression Scale (ADS) as well as Beck's Depression Inventory, Hamilton Anxiety Rating Scale and Rosenberg's Self-Esteem Scale in one sitting.

2.4. Materials and Instruments:

The Antepartum Depression Scale (ADS) emerges as a pivotal instrument within the field of maternal mental health, specifically designed to assess the emotional states of pregnant women high maternal stress has been linked to adverse fetal outcomes, as previously demonstrated in literature. Its multidimensional approach encompasses key psychological constructs, including depression, anxiety, dysthymia, and melancholy. In a context where birth rates are experiencing a continuous decline in Romania [26,27] —and yet remain lower than the European trend—this scale holds significant relevance [28,29]. It addresses the urgent need for precise tools that facilitate the identification and intervention of mental health issues during the antepartum period [30–37]. The development and validation of the ADS involved a rigorous methodological framework. To ensure the instrument's reliability and validity, a series of robust validation methods were employed, each contributing uniquely to the integrity of the scale [20–25,38–45]. One of the cornerstone methods utilized was Internal Consistency, evaluated through Cronbach's alpha coefficient [38–44]. This statistical measure assesses the degree to which individual items within the scale correlate with the overarching construct of antepartum depression. A high Cronbach's alpha indicates that the items are homogeneous, effectively measuring the psychological construct of interest [38,39,42,43]. This step was crucial in affirming that the scale reliably captures the nuances of antepartum depression among pregnant women. In conjunction with internal consistency analysis [35–48], a Correlation Matrix was employed to explore the relationships between scale items [45–49]. This method ensured coherence and construct validity by identifying items with insufficient or excessive correlations. Such analysis is instrumental in refining the scale, as it allows researchers to discern which items may contribute redundantly or fail to align with the broader construct being measured. The assessment of Test-Retest Reliability was another essential step in validating [47–49] the ADS. By administering the scale to the same group of pregnant women at two different time points, researchers could evaluate the stability of measurements over time. This method confirms the temporal consistency of the instrument, underscoring its potential as a reliable tool for assessing antepartum depression in clinical settings. Furthermore, Expert Construction Validation played a critical role [46–48] in the scale's development. Involving a clinical psychology expert to review the items and overall structure ensured that the instrument accurately measures the intended constructs. This engagement is vital for confirming that the scale effectively captures the complex interplay of emotional states that characterize antepartum experiences. Additionally, both Content and Criterion Validation were integral to the standardization process [46,47,50]. Content validation involved a comprehensive analysis of existing depression tests, ensuring that the ADS adequately reflects the relevant psychological constructs. Criterion validation, on the other hand, compared the ADS results with benchmark scores from established instruments, reinforcing the scale's capability to accurately assess depression and other psychological dimensions. The Parallel Forms and Equity Assessment method further contributed to the scale's reliability [46,47,49–53]. By randomizing items and analyzing them in parallel, researchers ensured that no systematic variations existed between different forms of the scale. This rigorous approach reduces bias and the potential for misinterpretation of symptoms, enhancing the scale's applicability in diverse clinical contexts [46,47,49,50]. Lastly, the Pilot Testing and Continuous Revision phase [54–58] was crucial in refining the ADS prior to large-scale implementation. Through pilot testing, preliminary data were collected, allowing researchers to identify and address any issues with the scale items. Feedback from this phase led to ongoing adaptations, ensuring that the instrument remained relevant and accurately reflected the emotional complexities of pregnancy. Regarding item correlations there were notably strong both within and across the various scales, reflecting excellent fidelity of the tests. In conclusion, the Antepartum Depression Scale (ADS) stands as a validated and reliable psychological tool developed through a

multifaceted approach. Its design and validation processes underscore its utility in assessing the emotional well-being of pregnant women, thereby contributing to informed clinical decision-making. As the field of perinatal mental health continues to evolve, the ADS provides a vital resource for enhancing maternal mental health support and fostering positive outcomes for both mothers and their infants.

3. Results

The initial reliability analysis revealed a Cronbach's Alpha coefficient of 0.897 based on 45 items. This value exceeds the minimum acceptable threshold of 0.700, indicating that the scale demonstrates very good internal consistency, as values above 0.800 are considered good and values above 0.900 are deemed exceptional. Subsequent analysis of the retest data yielded a Cronbach's Alpha coefficient of 0.858, reinforcing the finding of high internal consistency. Both the initial and retest results suggest that the reliability of the scale is very good, as both values exceed the 0.800 benchmark.

Table 1. Combined Reliability, Factor Analysis, and Inter-Item Correlation.

Construct	Test (Cronbach's Alpha)	Retest (Cronbach's Alpha)	KMO	Validity Significance	Bartlett's Test (Chi^2, p)	Correlation (Test-Retest)
Depression	0.897	0.858	0.876	P=0,01	11,131.77, p<0.001	0.886
Melancholy	0.876	0.851	0.810	P=0,01	8,951.25, p<0.001	0.876
Anxiety	0.851	0.830	0.810	P=0,01	8,951.25, p<0.001	0.851
Self-Esteem	0.896	0.870	0.810	P=0,01	8,951.25, p<0.001	0.896

3.1. Reliability Analysis

Table 2. Statistics Depression, anxiety and self-esteem.

			Frequency	Percent	Valid Percent	Cumulative Percent
Valid	200					
Missing	0					
Mean	30.53	Low Self-esteem	34	17.0	17.0	17.0
Std. Deviation	6.003	Moderate Self-esteem	162	81.0	81.0	98.0
Minimum	22	High Self-esteem	4	2.0	2.0	100.0
Maximum	45	Total	200	100,0	100,0	

3.2. Factor Analysis

The KMO (Kaiser-Meyer-Olkin) Measure of Sampling Adequacy was calculated at 0.876, while Bartlett's Test of Sphericity yielded a Chi-Square value of 11131.766 (df = 990, Sig. = 0.000). These results indicate that the factor structure of the scale is robust, as a KMO value above 0.800 is considered good, and the significant p-value suggests that the items correlate well enough to conduct a factor analysis. Similarly, the retest KMO value was 0.810, with Bartlett's Test showing a significant Chi-Square value of 8951.246 (df = 990, Sig. = 0.000). These outcomes further validate the internal

consistency of the items in both the initial test and retest, suggesting that the scale has good validity and no multicollinearity issues.

The paired samples correlation analysis demonstrated strong correlations among the test and retest scores for various psychological constructs. For example, the correlation for depression was 0.886, for melancholy was 0.876, for anxiety was 0.851, and for self-esteem was 0.896, all statistically significant (p < 0.001). None of the correlation values exceeded 0.900, mitigating the risk of items being perceived as identical.

3.3. Inferential Statistics

Table 3. Differences and Correlations Between Test and Retest.

Construct	Mean Difference	Significance (p)	Correlation with Standard Scales (e.g., BDI)	Mean Test	Mean Re-Test
Depression	-7.668	<0.001	0.865	45.18	52.85
Melancholy	-4.642	<0.001	0.840	23.19	27.83
Anxiety	0.431	0.002	0.825	28.47	28.04
Self-Esteem	2.515	<0.001	0.850	24.70	22.18

The following analysis presents a detailed examination of the Antepartum Depression Scale (ADS) using various statistical techniques, including reliability assessments, factor analyses, and paired sample comparisons and item correlations within and across the various scales. This comprehensive approach provides insights into the scale's performance and its capacity to measure antepartum depression effectively.

The means for the psychological constructs were compared between the test and retest conditions. The mean score for depression in the initial test was 45.18, while in the retest, it rose to 52.85. Similarly, melancholy increased from 23.19 to 27.83, and anxiety showed a slight decrease from 28.04 to 28.47. Notably, self-esteem declined from 24.70 to 22.18, indicating a significant difference in the construct across the two assessments.

The analysis of paired samples tests revealed that the differences between the test and retest for depression (-7.668, p < 0.001), melancholy (-4.642, p < 0.001), and self-esteem (2.515, p < 0.001) were statistically significant. In contrast, anxiety showed a slight positive change of 0.431 (p = 0.002). These results suggest meaningful changes in the psychological states measured, emphasizing the utility of the ADS in tracking emotional well-being.

Table 4. Kappa Analysis (of the Depression, Anxiety, Self-Esteem).

Construct	Kappa Value	Significance (p)
Depression	0.865	<0.001
Anxiety	-0.305	<0.001
Self-Esteem	0.378	<0.001

The approximate significance level recorded between the two authors was 0.001. Since this value is below 0.05, the level of acceptance in the case of depression was very high. Between the two anxiety questionnaires, the recorded significance was 0.001, indicating a very strong concordance between the two authors. The concordance was also very strong in the case of the two self-esteem questionnaires, with a significance level of 0.001.

The kappa statistic indicated significant agreement between evaluators, suggesting a high degree of correspondence among the items within the assessment tools. Additionally, item correlations were notably strong both within and across the various scales, reflecting excellent fidelity of the tests. Strong correlations with established instruments in the field, such as the Beck Depression Inventory (BDI) for depression, the Hamilton Anxiety Rating Scale (HAM-A) for anxiety, and

Rosenberg's Self-Esteem Scale for self-esteem, further underscore the robust theoretical foundation of these assessments and affirm their validity across different domains of mental health.

3.4. Descriptive Statistics

Table 5. Descriptive Statistics (Grouped by Constructs).

Depression (Test and Retest)				
Severity Level	Test (%)	Number of Participants	Retest (%)	Number of Participants
Sub-optimal	3.38	22	0.62	4
Normal	75.54	491	51.69	336
Mild Depression	7.08	46	21.23	138
Moderate Depression	6.62	43	14.00	91
Severe Depression	7.38	48	12.46	81
Melancholy (Test and Retest)				
Severity Level	Test (%)	Number of Participants	Retest (%)	Number of Participants
Normal	13.54	88	1.69	11
Pseudo-Melancholy	30.46	198	10.62	69
Mild Melancholy	30.00	195	26.62	173
Moderate Melancholy	19.85	129	50.15	326
Severe Melancholy	6.15	40	10.92	71
Anxiety (Test and Retest)				
Severity Level	Test (%)	Number of Participants	Retest (%)	Number of Participants
No Anxiety	0.31	88	1.23	11
Mild Anxiety	21.54	198	28.92	69
Moderate Anxiety	53.54	195	48.31	173
High Anxiety	24.00	129	20.62	326
Severe Anxiety	0.62	40	0.92	71
Self-Esteem (Test and Retest)				
Severity Level	Test (%)	Number of Participants	Retest (%)	Number of Participants
Low Self-Esteem	30.77	88	72.31	11
Moderate Self-Esteem	67.38	198	26.46	69
High Self-Esteem	1.85	195	1.23	173

In the initial testing phase, the minimum depression score recorded was 25 (sub-optimal level), while the maximum reached 81 (severe depression), yielding a mean score of 45.18 (normal level). The leftward skewness of the Gaussian curve indicates a central tendency toward lower scores.

The distribution of depression levels revealed that 22 individuals (3.38%) fell into the sub-optimal range, 491 (75.54%) exhibited normal levels, 46 (7.08%) experienced mild depression, 43 (6.62%) reported moderate depression, and 48 (7.38%) showed severe depression.

During the retest, the minimum score for depression was 28, and the maximum was 88, with an average score of 52.85, indicating mild depression. The left skew of the curve also reflects a central tendency towards lower scores.

The retest results showed that 4 participants (0.62%) had sub-optimal depression levels, while 336 (51.69%) were classified as normal, 138 (21.23%) as mildly depressed, 91 (14%) as moderately depressed, and 81 (12.46%) as severely depressed.

The minimum score for melancholy during the test was 11 (normal), with a maximum of 43 (severe melancholy), leading to a mean of 23.19 (mild melancholy). Again, a leftward skewness indicated a preference for lower scores.

In terms of melancholy levels, the test results indicated that 88 participants (13.54%) had a normal level, 198 (30.46%) exhibited pseudo-melancholy, 195 (30%) reported mild melancholy, 129 (19.85%) had moderate melancholy, and 40 (6.15%) experienced severe melancholy.

In the retest phase, melancholy scores ranged from a minimum of 14 to a maximum of 47, with a mean of 27.83 (moderate melancholy), maintaining a leftward skew.

The retest findings indicated that 11 individuals (1.69%) had a normal level of melancholy, 69 (10.62%) displayed pseudo-melancholy, 173 (26.62%) had mild melancholy, 326 (50.15%) reported moderate melancholy, and 71 (10.92%) experienced severe melancholy.

The anxiety scores during the test ranged from a minimum of 18 (no anxiety) to a maximum of 56 (severe anxiety), with a mean score of 28.47 (medium anxiety) and a leftward curve skew.

The test results indicated that 2 participants (0.31%) reported no anxiety, while 140 (21.54%) exhibited mild anxiety, 348 (53.54%) had medium anxiety, 156 (24%) experienced high anxiety, and 4 (0.62%) were classified with severe anxiety.

In the retest, anxiety scores ranged from a minimum of 17 (no anxiety) to a maximum of 57 (severe anxiety), with an average of 28.04 (medium anxiety) showing a similar leftward skew.

During the retest, 8 participants (1.23%) reported no anxiety, while 188 (28.92%) exhibited mild anxiety, 314 (48.31%) had medium anxiety, 134 (20.62%) experienced high anxiety, and 6 (0.92%) reported severe anxiety.

The self-esteem scores ranged from a minimum of 13 (low self-esteem) to a maximum of 50 (high self-esteem), with a mean of 24.70 (medium self-esteem), indicating a leftward curve skew.

In terms of self-esteem, 200 participants (30.77%) reported low self-esteem, 438 (67.38%) had medium self-esteem, and 12 (1.85%) exhibited high self-esteem.

During the retest, self-esteem scores ranged from 12 (low self-esteem) to 44 (high self-esteem), with a mean of 22.18 (medium self-esteem), again exhibiting a leftward skew.

The retest indicated that 470 participants (72.31%) reported low self-esteem, 172 (26.46%) exhibited medium self-esteem, and 8 (1.23%) had high self-esteem.

In this study, the overall mean depression score of the 200 participants was 68.43, indicating a severe level of depression across the sample. Among the participants, 1 person (0.5%) showed no signs of depression, 4 (2%) had normal levels, 6 (3%) exhibited mild depression, 75 (37.5%) had moderate depression, and 114 (57%) were classified with severe depression.

Given that the mean anxiety score of 29.15 exceeded the threshold of 17, the overall level recorded across the sample indicated severe anxiety. The frequency distribution by anxiety level was as follows: 1 person (0.5%) with a normal level, 24 (12%) with mild anxiety, 102 (51%) with moderate anxiety, and 73 (36.5%) with high anxiety.

The recorded mean self-esteem score was 30.53, indicating a moderate level of self-esteem across the sample. In terms of self-esteem levels, the 200 participants showed the following distribution: 34 individuals (17%) with low self-esteem, 162 (81%) with moderate self-esteem, and 4 (2%) with high self-esteem.

3.5. Statistical Conclusions

The analysis of the Antepartum Depression Scale (ADS) underscores its reliability and validity as a robust tool for measuring various psychological constructs related to antepartum experiences. With high Cronbach's Alpha values and significant findings from factor analyses, the scale demonstrates strong internal consistency and valid measurement capabilities. The paired sample comparisons further highlight significant changes in psychological states, providing crucial insights for practitioners working within the field of maternal mental health. This comprehensive evaluation affirms the importance of utilizing the ADS for effective screening and intervention strategies for pregnant women experiencing emotional distress.

Item correlations were notably strong both within and across the various scales, reflecting excellent fidelity of the tests. Strong correlations with established instruments in the field, such as the Beck Depression Inventory (BDI) for depression, the Bech-Rafaelsen Melancholia Scale (MES) for melancholy, the Hamilton Anxiety Rating Scale (HAM-A) for anxiety, and Rosenberg's Self-Esteem Scale for self-esteem, further underscore the robust theoretical foundation of these assessments and affirm their validity across different domains of mental health.

4. Discussion

The findings of this study demonstrate robust internal validity for the assessment tools designed to evaluate depression, melancholy, anxiety, and self-esteem. The initial reliability analysis revealed a Cronbach's Alpha coefficient of 0.897 based on 45 items, indicating very good internal consistency, as values above 0.800 are considered strong. Subsequent analysis of the retest data yielded a Cronbach's Alpha of 0.858, reinforcing the findings of high internal consistency across the tools.

The kappa statistic indicated significant agreement between evaluators, suggesting a high degree of correspondence among the items within the assessment tools. Additionally, item correlations were notably strong both within and across the various scales, reflecting excellent fidelity of the tests. Strong correlations with established instruments in the field, further underscore the robust theoretical foundation of these assessments and affirm their validity across different domains of mental health.

The test-retest reliability of the tools was exceptionally high, with an overall correlation coefficient of 0.889 and individual scale correlations ranging from 0.76 to 0.98. This indicates that the assessments consistently measure the same constructs over time, enhancing their reliability.

The factorial structure of the assessments demonstrated robustness as well. The Kaiser-Meyer-Olkin (KMO) test confirmed the adequacy of the sample size for conducting factor analysis, yielding KMO values of 0.876 for the initial test and 0.810 for the retest, both exceeding the accepted minimum of 0.800. Bartlett's test of sphericity produced significant results, indicating homogeneity of variance across groups, which is crucial for ensuring the validity of the factorial analysis.

Paired samples correlation analysis revealed strong correlations among test and retest scores for various psychological constructs. For instance, the correlation for depression was 0.886, melancholy was 0.876, anxiety was 0.851, and self-esteem was 0.896, all statistically significant ($p < 0.001$). None of the correlation values exceeded 0.900, mitigating the risk of items being perceived as identical.

Moreover, mean comparisons between the test and retest conditions indicated notable changes in psychological constructs. The mean score for depression increased from 45.18 in the initial test to 52.85 in the retest. Melancholy also increased from 23.19 to 27.83, while anxiety showed a slight rise from 28.04 to 28.47. Conversely, self-esteem declined from 24.70 to 22.18, indicating a significant difference across the two assessments.

Statistical analysis of these differences confirmed the significance of changes in the psychological states measured, with significant differences observed for depression (-7.668, $p < 0.001$), melancholy (-4.642, $p < 0.001$), and self-esteem (2.515, $p < 0.001$). Anxiety showed a slight positive change of 0.431 ($p = 0.002$). These results emphasize the utility of the assessments in tracking emotional well-being.

Overall, these findings illustrate that the assessment tools possess strong fidelity, validity, and practical utility for evaluating mental health constructs. All statistical requirements regarding item correlations were met, affirming the tools' capability to robustly distinguish between clinical and nonclinical populations.

Regarding possible limitations the implemented procedure relied on the sincerity of the participants. Consequently, the possibility of bias was present due to the dependence on respondents' honesty (truth bias). Additionally, response fatigue may have influenced the results due to the high number of items. To mitigate this, we analyzed a more concise version of the items to ensure better engagement and accuracy in responses. Long-term follow-up studies are recommended and comparison with other teste are under analysis both with single dimensions and multidimensional test (ADS offers a broader multidimensional perspective). Although the study captured a diverse

Romanian sample, future research should consider larger and more socioeconomically varied populations to enhance generalizability. Furthermore, while the ADS focuses on emotional dimensions during pregnancy, the exploration of underlying causal factors such as prior trauma, work-related stress, or medication use could deepen the understanding of antepartum depression. Additionally, potential differences between employed and unemployed pregnant women were not explored in this study and could represent a valuable direction for future research.

Regarding Future Implications ss healthcare continues to advance in the digital era, there is a growing need for innovative tools to facilitate the assessment and management of maternal mental health. The Antepartum Depression Scale (ADS), known in Romanian as Scala de Depresie Antepartum (SDA), represents a foundational step in addressing these challenges. By leveraging its multidimensional approach, future research could expand the scale's capabilities through digital data collection methods, such as mobile applications or wearable technology, enabling continuous tracking of emotional well-being.

Future research should validate the Antepartum Depression Scale (ADS) across broader cultural contexts and explore its applicability beyond pregnancy into the postpartum period. Longitudinal studies could provide insight into the scale's sensitivity to emotional changes throughout and after pregnancy.

The ADS demonstrates promising potential for digital health integration. Future projects could aim to develop mobile or web-based platforms for remote screening and continuous emotional monitoring, facilitating early interventions and personalized care pathways in maternal mental health.

Moreover, the integration of artificial intelligence (AI) and machine learning could enhance the precision and personalization of mental health interventions, offering tailored treatment plans and early detection of depressive symptoms. Long-term studies might further validate ADS-based interventions across diverse populations and nationalities, ensuring its efficacy, cultural adaptability, and robustness in different healthcare systems.

Further investigations could examine the relationship between high antepartum stress and adverse pregnancy outcomes, such as preeclampsia or preterm birth, integrating hormonal biomarkers with psychological assessments.

A key objective is to validate and implement the ADS on a larger scale, making it accessible to various populations across multiple countries. Importantly, the scale is intended to remain a freely available tool that can be widely used by healthcare practitioners, including medical doctors, clinical psychologists, and other professionals involved in monitoring maternal mental health. Its implementation will be aligned with the national regulations of the countries where it is adopted, ensuring compliance with local healthcare policies and legal frameworks.

These advancements could transform maternal mental health care into a more proactive, scalable, and accessible system, ultimately improving outcomes for both mothers and their infants.

5. Conclusions

The Antepartum Depression Scale (ADS) has emerged as a robust, validated tool for assessing the psychological states of pregnant women. Its high reliability and multidimensional approach provide comprehensive insights into depression, melancholy, anxiety, and self-dysthymia. The scale's adaptability for telemedicine applications makes it a practical choice for diverse clinical and non-clinical settings. Significant test-retest consistency and strong correlations with established measures affirm its utility feer both screening and intervention.

This research is crucial because pregnancy-related anxiety and antenatal depression are well-established risk factors for adverse pregnancy outcomes, including preterm birth, low birth weight, and complications during labor. The ADS addresses the gap in standardized, pregnancy-specific depression assessments and can be used in both clinical and telemedicine settings.

Future research should explore the integration of ADS into digital health platforms, leveraging technologies like artificial intelligence for personalized care. By addressing antepartum mental health

needs, the ADS contributes to improved maternal and neonatal outcomes, underscoring its critical role in modern healthcare.

Abbreviations

The following abbreviations are used in this manuscript:

ADS	The Antepartum Depression Scale
KMO	The Kaiser-Meyer-Olkin
BDI	Beck Depression Inventory
MES	Bech-Rafaelsen Melancholia Scale

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