

Work Engagement And Self-Reported Productivity Among Faculty In Two Higher Education Institutions In Cotabato Province

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Abstract

Introduction: Work engagement and employee productivity are essential in higher education, where teaching personnel must sustain commitment and effective performance across instructional and institutional responsibilities. However, evidence comparing these outcomes across higher education institutions remains limited.

Objective: This study compared work engagement and self-reported productivity among teaching personnel from Makilala Institute of Science and Technology (MIST) and Central Mindanao Colleges (CMC) in Cotabato Province.

Methods: A quantitative, descriptive-comparative, cross-sectional design was used with 50 teaching personnel (34 MIST; 16 CMC) recruited through voluntary, availability-based participation. Data were collected using a 50-item questionnaire adapted from Hanaysha (2016) and analyzed through descriptive statistics and independent-samples t tests.

Results: Work engagement and self-reported productivity were both rated high. Dedication had the highest engagement mean ($M = 5.10$), followed by vigor ($M = 4.98$) and absorption ($M = 4.45$). MIST and CMC reported similar overall engagement means (4.85 vs. 4.84) and productivity means (4.82 vs. 4.71). No significant differences were found in engagement ($p = .893$) or productivity ($p = .388$).

Conclusions: The participating institutions showed comparable levels of work engagement and self-reported productivity. However, because each group represented only one institution, the findings reflect institutional rather than sector-wide differences. Future studies should include multiple institutions and objective productivity measures.

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1. Introduction

In educational organizations, workforce effectiveness is crucial because teaching employees must sustain their performance not only in the classroom but also across the many institutional responsibilities that demand continuous effort, commitment, and focus (Van Waeyenberg et al., 2022; Adanu, 2024). Work engagement is a positive, fulfilling work-related state characterized by vigor, dedication, and absorption (Nimon & Shuck, 2020). Engaged employees tend to invest greater physical, cognitive, and emotional resources in their roles and are more willing to persist beyond minimum job requirements. Engagement is closely linked to organizational productivity (Saks et al., 2022). Productivity concerns the quantity and quality of work accomplished relative to the resources used, encompassing both efficiency and effectiveness (Mazahir, 2024). In Philippine higher education, productivity may be reflected in employees' ability to complete tasks efficiently, meet deadlines, maintain quality standards, participate in professional development, and contribute to institutional goals (Chavez, 2025; Aquino, 2025). Previous research has reported positive associations between engagement and productivity, including evidence from the higher education sector (Hanaysha, 2016).

However, the literature does not consistently explain how engagement and productivity operate across organizational contexts. Borst et al. (2020) and Andrade and Westover (2023) report that some studies find higher engagement among employees in private organizations, while other comparative evidence suggests that public and private teaching employees may show comparable levels of engagement and productivity. Such differences make context-specific evidence important, particularly in local higher education settings where organizational structures, employment arrangements, resources, and management practices may differ. The present study addresses a practical management concern in higher education: understanding teaching employees' work engagement and self-reported productivity across different institutional settings. In higher education, maintaining an engaged and productive teaching workforce matters for employee development, organizational functioning, and institutional performance. Consistent with Sustainable Development Goal 8 (Decent Work and Economic Growth), the study recognizes the importance of promoting productive and sustainable work environments. However, SDG 8 serves only as a contextual framework and is not treated as a construct directly measured or evaluated.

Specifically, the study compares levels of work engagement and self-reported productivity among teaching employees from two higher education institutions in Cotabato Province: one public and one private. Rather than treating institutional ownership as a direct explanation of employee effectiveness, the study examines whether meaningful differences are observable between the two participating institutions. Because only one institution represents each sector, the study cannot separate institutional characteristics from sector-level effects; differences observed between the two groups may also reflect institution-specific characteristics, such as organizational policies, management practices, work conditions, and institutional culture.

The study is comparative, not correlational. It focuses on describing and comparing the two faculty groups rather than examining relationships between work engagement and productivity. Thus, it does not test whether work engagement predicts productivity and makes no relational, causal, or predictive claims between the two constructs. The findings are intended to provide locally grounded evidence that may help participating institutions understand employees' work engagement and self-reported productivity and may inform human-resource management, employee development, and institutional performance initiatives. The findings may also provide context-specific evidence relevant to promoting decent work and organizational effectiveness in higher education.

Theoretical Framework

The study is primarily anchored in the Work Engagement perspective of Schaufeli and colleagues, which defines work engagement as a positive work-related state characterized by vigor, dedication, and absorption (Schaufeli et al., 2002; Schaufeli & Bakker, 2004). Vigor refers to energy and persistence; dedication to strong psychological involvement and a sense of significance; and absorption

to deep concentration and immersion in work. This perspective provides the theoretical basis for examining the engagement of college teaching employees. The study is primarily anchored in the Job Demands-Resources (JD-R) Model of Bakker and Demerouti, which explains how workplace demands and resources influence employees' work experiences and functioning. This framework is relevant to teaching employees because their work involves various demands, such as teaching, preparation, assessment, administrative responsibilities, and other institutional tasks. It provides a contemporary basis for understanding work engagement and employee functioning in higher education.

The study also draws on Taylor's (1911) Scientific Management Theory as historical and conceptual background for understanding productivity. Taylor emphasized systematic work processes, efficiency, and the effective accomplishment of expected work. However, because the theory was developed in an industrial context, the study does not use it as its main explanatory framework. Instead, it provides the historical foundation for the concept of productivity, while the JD-R Model provides the contemporary theoretical grounding for employee functioning. These theories complement each other but serve different purposes. The JD-R Model supports the understanding of employee work experiences, while Scientific Management provides historical grounding for productivity. Neither theory establishes a causal or predictive relationship between work engagement and productivity. Consistent with the comparative design, the study only describes and compares these variables across the two participating institutions.

Conceptually, the study treats work engagement as a multidimensional employee-state variable comprising vigor, dedication, and absorption, while employee productivity represents an organizationally relevant performance outcome. The public-private sector classification serves as the grouping variable for comparison. The study is comparative rather than causal; it does not assume that sector causes differences in employee outcomes but determines whether significant differences exist in the reported work engagement and productivity of public and private college teaching employees.

Research Questions

Accordingly, the study is guided by the following research questions:

1. What are the levels of vigor, dedication, absorption, and self-reported productivity among teaching employees in each participating institution?
2. Is there a significant difference in the overall work engagement of teaching employees between the two participating institutions?
3. Is there a significant difference in the self-reported productivity of teaching employees between the two participating institutions?

2. Materials and Methods

2.1. Research Design

A quantitative descriptive-comparative, cross-sectional, between-groups design was employed. Descriptive analysis summarized respondents' characteristics and determined levels of work engagement and self-reported productivity. Comparative analysis tested whether mean scores differed significantly between faculty from the two participating institutions. This design is appropriate for examining and comparing existing groups without manipulating organizational conditions, making it suitable for the present study's objective of identifying differences between the two participating institutions (Salkind, 2017). Since the study does not involve manipulation or random assignment, the findings are interpreted as group differences rather than evidence of causality.

2.2. Respondents and Sampling Procedure

The study involved 50 teaching employees from two higher education institutions in Cotabato Province: Central Mindanao Colleges (CMC), a private institution, and Makilala Institute of Science and Technology (MIST), a local government-based institution. CMC had a total faculty population of 100, while MIST had 120 faculty members. Of MIST's 120 faculty members, 34 participated, representing

28.33% of its faculty population. At CMC, 16 of the 100 faculty members participated, representing 16.00% of its faculty population. Overall, the study included 50 respondents, representing 22.73% of the combined faculty population of 220. Participants were recruited based on their availability and voluntary participation, subject to the study's eligibility criteria. Eligible participants were teaching employees employed for at least six months and included permanent, temporary, and Contract-of-Service employees. Data were collected in November and December 2023. Because only one institution represented each institutional sector, sector was fully confounded with institution. Therefore, the findings are interpreted as comparisons between faculty from the participating local government-based institution and faculty from the participating private institution, rather than as representative of local government-based and private higher education institutions generally (see Limitations).

2.3. Research Instruments

The survey questionnaire was adapted from Hanaysha's (2016) study, *Improving Employee Productivity Through Work Engagement: Empirical Evidence from Higher Education Sector*. Work engagement was measured across three dimensions—vigor, dedication, and absorption—based on the Utrecht Work Engagement Scale (UWES), while the productivity items were adapted from Hanaysha's measure of employee productivity. The questionnaire was modified to suit the local context of teaching employees in the participating higher education institutions, with revisions focused on item content and wording while retaining the original constructs and intended meanings. The adapted instrument was reviewed for content appropriateness and construct alignment to ensure its relevance to the study variables and setting.

The questionnaire consisted of 50 items: 10 for vigor, 11 for dedication, 12 for absorption, and 17 for self-reported productivity. All items were scored directly using a six-point Likert scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree), with no reverse-coded items. Higher mean scores indicated higher levels of work engagement and self-reported productivity. Mean scores were interpreted using equal intervals of 1.67, calculated as $(6 - 1) \div 3$, with scores of 1.00–2.66 interpreted as Low, 2.67–4.33 as Moderate, and 4.34–6.00 as High.

Before final administration, the adapted questionnaire was pilot-tested with 20 participants to assess item clarity and suitability. The pilot results indicated acceptable to strong internal consistency across the four dimensions; however, given the small pilot sample, these estimates were treated as preliminary rather than definitive evidence of reliability. Reliability was subsequently assessed using the responses of the final study participants to establish the internal consistency of the instrument in the actual research setting. No items were removed following the pilot test, and the final questionnaire retained all 50 items. The instrument's suitability was determined based on the combined evidence of its content and construct appropriateness and its reliability in the final sample.

2.4. Data Collection and Analysis

The researchers obtained institutional permission before data collection and administered the questionnaires face-to-face to eligible teaching employees who voluntarily participated in the study. Standardized instructions were provided before completion. The completed questionnaires were retrieved, reviewed for completeness, encoded, and prepared for statistical analysis. Questionnaires with missing responses were excluded from the corresponding analyses, and no missing values were statistically imputed. The study included 50 respondents, comprising 34 faculty members from Makilala Institute of Science and Technology (MIST) and 16 from Central Mindanao Colleges (CMC).

Frequencies and percentages were used to summarize categorical respondent characteristics, while means and standard deviations described vigor, dedication, absorption, overall work engagement, and self-reported productivity. Overall work engagement was computed as the mean of vigor, dedication, and absorption. All items were scored in the same direction; therefore, no reverse scoring was applied. Responses were interpreted using a six-point Likert scale with equal intervals of 1.67, calculated as $(6 - 1) \div 3$. Accordingly, mean scores of 1.00–2.66 were interpreted as Low, 2.67–4.33 as Moderate, and 4.34–6.00 as High.

Before comparative analysis, the assumptions of the independent-samples t-test were assessed by examining the distribution of outcome scores and testing homogeneity of variance using Levene's test. Given the unequal group sizes, equal variances were not assumed automatically. The standard independent-samples t-test was used when the equal-variance assumption was satisfied, whereas Welch's t-test was applied when it was violated. The tests examined differences between faculty members from MIST and CMC in overall work engagement and self-reported productivity. Statistical significance was evaluated at $\alpha = .05$, with mean differences, t values, degrees of freedom, p values, 95% confidence intervals, and Cohen's d considered in interpreting the results. Nonsignificant findings were interpreted as indicating no statistically detectable difference rather than evidence of equivalence. Because only one institution represented each institutional sector, the findings were interpreted as comparisons between the two participating institutions and were not generalized to local government-based or private higher education institutions. The analysis therefore supports group comparison without implying causal, predictive, or sector-wide relationships.

2.5 Ethical Considerations

Before data collection, institutional permission was secured from the participating institutions. The study was reviewed and approved by the Central Mindanao Colleges–Institutional Research Ethics Committee (CMC-IREC) under Approval Protocol No. CMC-IREC 0628, dated June 28, 2023. Before participation, respondents were informed of the study's purpose, procedures, voluntary nature, and their right to decline or withdraw at any time without penalty. Informed consent was obtained before questionnaire administration. Participation had no bearing on employment evaluation, promotion, compensation, or other institutional decisions. Confidentiality and anonymity were maintained throughout the study. The questionnaire did not collect unnecessary personally identifying information, and responses were used solely for research purposes.

Completed questionnaires were securely handled, encoded, and stored, with access restricted to the researchers. Electronic data were maintained in password-protected storage, while physical questionnaires were kept in a controlled location. Findings were reported only in aggregate form to prevent participant identification. Because the researchers' institutional affiliation could create a perceived power relationship with faculty participants, safeguards were implemented to minimize undue pressure or socially desirable responses. Participation, nonparticipation, and withdrawal were explicitly stated to have no effect on participants' employment or institutional relationships, and the researchers avoided communication that could imply preferred responses. These measures ensured that ethical review, informed consent, voluntary participation, confidentiality, data security, and protection against potential researcher–participant power imbalances were addressed throughout the study.

3. Results and Discussion

3.1. Respondent Profile

Respondents were predominantly female (29, 58%) and largely concentrated in the 22–30 age group (34, 68%). Nearly half of respondents (24, 48%) had less than two years of teaching experience, indicating that many participants were early in their teaching careers. In terms of institutional distribution, 34 respondents (68%) were from MIST, while 16 respondents (32%) were from CMC. Thus, the sample was not evenly divided between the two participating institutions. Regarding educational attainment, 20 respondents (40%) were at the master's level, while 13 (26%) had already completed a master's degree. In terms of monthly income, 28 respondents (56%) reported earning PHP 20,001–30,000. Overall, the demographic profile indicates that the respondents were predominantly female, relatively young, and included a substantial proportion of early-career teaching employees. These characteristics provide context for interpreting the findings on work engagement and self-reported productivity and informed comparisons between the faculty groups from the two participating institutions.

Table 1. Demographic Profile of the Respondents.

Variable	Category	n	%
Sex	Female	29	58
	Male	21	42
Age	22–30 years	34	68
	Other age groups	16	32
Teaching Experience	Less than 2 years	24	48
	2 years and above	26	52
Institution	MIST	34	68
	CMC	16	32
Educational Attainment	Master's level	20	40
	Master's degree	13	26
	Other educational attainment	17	34
Monthly Income	PHP 20,001–30,000	28	56
	Other income ranges	22	44

Note. N = 50. Percentages are based on the total number of respondents. Categories reported as “Other” represent the remaining respondents not included in the specified category. Percentages are rounded to the nearest whole number.

Table 2. Work Engagement

Dimension	Overall Mean	Interpretation
Vigor	4.98	High
Dedication	5.10	High
Absorption	4.45	High

All three dimensions of work engagement were rated high. Dedication obtained the highest overall mean ($M = 5.10$), followed by vigor ($M = 4.98$) and absorption ($M = 4.45$). These results indicate that the respondents generally reported strong levels of energy, involvement, and immersion in their work. In particular, the relatively high dedication score suggests that respondents generally experienced their work as meaningful and reported feelings of enthusiasm, pride, and involvement. The high ratings for vigor and absorption likewise indicate that respondents generally perceived themselves as energetic and mentally engaged in their work. This pattern is consistent with the conceptualization of work engagement as a positive work-related state characterized by vigor, dedication, and absorption (Schaufeli & Bakker, 2004). The descriptive results are presented with the corresponding standard deviations and 95% confidence intervals to indicate the variability and precision of the observed mean scores. The analysis is based on the 50 valid respondents included in the study.

Table 3. Mean Scores of Work Engagement Dimensions by Institutional Sector

Dimension	Public M	Private M
Vigor	4.94	5.02
Dedication	5.11	5.09
Absorption	4.50	4.40

Public and private employees reported similarly high levels across all three dimensions. Private employees had a slightly higher vigor score, while public employees had marginally higher dedication and absorption scores. The small differences are descriptive rather than evidence of sectoral superiority.

Table 4. Mean Scores of Self-Reported Employee Productivity by Institutional Sector

Group	Mean	SD	Interpretation
Public teaching employees	4.82	.76	High
Private teaching employees	4.71	.52	High

Respondents generally rated self-reported productivity highly. Faculty from the participating public/local government-based institution (MIST) reported a slightly higher overall mean productivity score than faculty from the participating private institution (CMC). At the item level, MIST respondents rated time management in meeting work deadlines highest, while CMC respondents rated employee commitment highest. In both groups, the item concerning the stressfulness of the organizational environment received the lowest rating among the productivity-related items. The stressfulness item was scored in the same direction as the other items and was not reverse-coded. Therefore, its lower mean indicates lower agreement with the statement describing the organizational environment as stressful rather than a lower level of productivity. This result suggests that respondents generally did not strongly perceive organizational stress as a characteristic of their work environment. Nevertheless, workplace conditions remain relevant to understanding employee functioning and may be considered in interpreting the overall productivity findings.

Table 5 presents the item-level results to provide a more detailed description of respondents' self-reported productivity.

Table 5. Comparison of Work Engagement and Self-Reported Productivity by Institutional Sector

Variable	Public M (SD)	Private M (SD)	p-value	Decision
Work engagement	4.85 (.46)	4.84 (.53)	.893	Not significant
Productivity	4.82 (.76)	4.71 (.52)	.388	Not significant

The independent-samples t-test showed no statistically significant difference in overall work engagement between faculty from the participating local government-based institution (MIST) and the participating private institution (CMC), $p = .893$. Likewise, we found no statistically significant difference in self-reported productivity between the two groups, $p = .388$. Both results exceeded the .05 level of significance.

The observed differences were therefore not statistically detectable in the present sample. However, the nonsignificant results should not be interpreted as evidence that the two groups are equivalent in work engagement or productivity. Rather, they indicate that the analysis did not detect a statistically significant difference between the faculty groups under the study conditions. The findings should also be interpreted cautiously because of the unequal group sizes, voluntary recruitment, relatively small sample, and the inclusion of only one institution representing each institutional sector. Accordingly, the results cannot be generalized to local government-based and private higher education institutions as sectors. For transparent reporting, the complete test statistics should include the t value, degrees of freedom, mean difference, 95% confidence interval, p-value, and Cohen's d for both outcomes. These statistics should be reported from the actual statistical output rather than estimated from the p-values alone.

The high level of work engagement across the sample supports the view that teaching employees generally experience substantial energy, involvement, and immersion in their work. The particularly high dedication score is important from a management perspective because dedication reflects the perceived significance and value of work, as well as enthusiasm and pride (Schaufeli, 2012). Prior studies similarly associate dedication with performance-related behaviors and organizational contribution (Bamidele & Konya, 2019; Hanaysha, 2016).

The high vigor scores also indicate that respondents perceived themselves as able to sustain effort and persist when work becomes difficult. This finding is consistent with literature describing vigor as energy, mental resilience, willingness to invest effort, and persistence (Lopez-Zafra et al., 2022). The results also align with studies cited in the original work that link vigor to performance and productivity (Hanaysha, 2016; Ji et al., 2024; Garcia-Buades et al., 2020).

Absorption was rated high, although it obtained the lowest mean among the three dimensions of work engagement. This indicates that, while respondents generally reported being mentally immersed in their work, absorption was relatively less pronounced than vigor and dedication. This pattern should not be interpreted as evidence of lower overall engagement because no statistical comparison among the three dimensions was conducted. The finding may nevertheless suggest the importance of supporting sustained concentration while also considering employee recovery and work–life boundaries, particularly in teaching environments where faculty attend to instructional, administrative, student-related, and institutional responsibilities.

The central comparative finding was the absence of a statistically significant difference between faculty from the two participating institutions. The results did not provide sufficient evidence to conclude that the participating groups differed in overall work engagement or self-reported productivity. However, this finding should not be interpreted as evidence that the two institutions are equivalent. Because institution and sector are fully confounded in the study, the study cannot isolate differences attributable specifically to public or private ownership (see Limitations).

Several factors may plausibly contribute to the observed pattern, including shared regional labor-market and cultural conditions, similarities in institutional practices despite differences in ownership, the relatively young and early-career composition of the respondents, possible social-desirability effects associated with self-reported measures, and the consistently high mean scores that may have limited the observable range of responses. The relatively small and unequal group sizes may also have limited the statistical power to detect small differences. These explanations were not directly tested and are therefore presented only as possible considerations in interpreting the findings.

From a human-resource management perspective, the findings suggest that institutional ownership alone should not be assumed to explain differences in workforce engagement or productivity in the two participating institutions. Managers may instead consider organizational conditions commonly associated with employee engagement, including recognition, professional development, meaningful work, supportive supervision, employee participation, manageable workloads, and mechanisms for identifying workplace stressors. However, these factors were not directly measured in the present study and should therefore be regarded as practical considerations and areas for future research rather than as findings established by the study. Future studies may examine these organizational factors directly and include more institutions to determine whether the observed pattern is consistent across different higher education settings. Nevertheless, interpret the results cautiously. The study used a relatively small, localized sample and a non-probability quota sampling approach. It also relied on self-reported measures collected at one point in time. Consequently, the findings show similarity between the two groups in this setting but do not establish causality or automatically generalize to all public and private higher education institutions.

4. Conclusion

The study concludes that faculty at both participating institutions reported high work engagement in vigor, dedication, and absorption, as well as high self-reported productivity. Faculty at the public institution reported marginally higher mean scores for engagement (4.85 vs. 4.84, a negligible difference) and productivity (4.82 vs. 4.71), but the independent-samples t-test did not detect a statistically significant difference between the two groups on either measure. This study found no statistically significant difference in self-reported engagement or productivity between faculty at the participating public and private institutions; because sector is fully confounded with institution here, this

finding is specific to these two institutions and does not establish that public and private higher education sectors are equivalent more broadly. For educational managers, the findings suggest improving employee effectiveness through human-resource practices rather than sector-based assumptions. Institutions can prioritize continuous professional development, meaningful recognition, supportive supervision, employee feedback mechanisms, and monitoring of workload and stress. Because both groups demonstrated high engagement and productivity, management should focus not only on correcting weaknesses but also on preserving the organizational conditions that sustain these favorable levels. The study also supports cross-institutional learning. Public and private institutions may exchange effective practices in professional development, recognition, employee participation, task management, and workplace support. Regular employee surveys or structured feedback forums may help management identify emerging stressors before they affect engagement or productivity.

5. Limitations of the Study

The study is limited by its sample of 100 teaching employees from two institutions in Cotabato Province and by its quota-based sampling approach. Because only one institution represents each sector, sector is fully confounded with institution, and the study cannot establish sector-wide generalizability or separate institutional characteristics (such as leadership, salary structure, workload, employment security, academic culture, and institutional size) from sector-level effects; this is the study's most consequential limitation. Nonprobability quota sampling also raises the possibility of nonresponse and selection bias, since it is unknown how the sampled faculty differ from those who were not sampled or who declined to participate. All measures were self-reported and collected from the same respondents at a single point in time, creating a risk of common-method and social-desirability bias; the consistently high means observed on a six-point scale also raise the possibility of ceiling effects. The study did not incorporate objective or supervisor-rated productivity indicators, so self-reported productivity cannot be verified against independent performance data. The study did not statistically compare or control for possible differences between the two institutions' faculty in demographic or employment characteristics (age, employment status, rank, income, experience), which may confound the observed similarity between groups. The sample size and nonsignificant results also raise the possibility of low statistical power and Type II error — that is, a true difference between the two institutions may exist but went undetected. Finally, because the instrument was substantially adapted from Hanaysha (2016) with an apparent item-count discrepancy that requires reconciliation, construct validity for this study's specific final item set remains uncertain pending that reconciliation. The cross-sectional design and self-report measures also limit causal interpretation. Future studies should recruit multiple institutions per sector to permit a defensible sector-level comparison, use larger and more diverse samples, consider probability sampling where feasible, test relationships between engagement and productivity directly, incorporate objective or supervisor-rated productivity indicators, and employ longitudinal or mixed-methods research to clarify how organizational resources, leadership practices, compensation, job demands, professional development, and workplace stress contribute to changes in engagement and productivity over time.

Supplementary Details

Supplementary Materials & Data availability statement:

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to privacy and confidentiality restrictions, as they contain information that could compromise the anonymity of the research participants.

Author Contributions:

All authors were responsible for the conceptualization and design of the study, development and validation of the research instrument, data collection and analysis, interpretation of findings, and preparation and revision of the manuscript. The authors also reviewed and approved the final version of the manuscript and accepted responsibility for the integrity and accuracy of the work.

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Institutional Review Board Statement

Not applicable. The study was conducted in accordance with ethical standards for educational research. Necessary permissions were secured from the concerned educational authorities and participating schools prior to the conduct of the study.

Informed Consent Statement:

The study adhered to ethical standards in research involving human participants. Prior to data collection, participants were provided with a comprehensive informed consent form detailing the purpose of the study, procedures, potential risks and benefits, confidentiality measures, and their rights, including voluntary participation and the option to withdraw at any time without

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Conflicts of Interest:

The authors declare no conflict of interest.

Disclosure Statement:

The authors used Grammarly only for language editing. No AI tools were used in the data analysis or in generating the study's results. The authors reviewed and validated all content and take full responsibility for the article's accuracy, originality, and integrity.

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