ORIGINAL RESEARCH

Educational intervention to improve emergency nursing care for patients after suicide attempts

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ABSTRACT

Objective: To evaluate the impact of an educational intervention aimed at improving knowledge and clinical understanding for emergency nursing professionals who care for patients following suicide attempts.
Methods: A quasi-experimental before-and-after study was conducted in Brazil in 2024 with 130 nursing professionals who were allocated to an intervention group (n = 25) that received a structured, interactive educational program or to an active control group (n = 105) that received written educational materials. Knowledge related to suicide attempts was assessed using a 14-item instrument administered before and after the interventions. Paired comparisons were performed using parametric or nonparametric tests based on data distribution, and effect sizes were calculated to estimate the magnitude of change.
Results: The intervention group showed statistically significant improvements in misconceptions related to suicide myths, religiosity, and stigma, with effect sizes ranging from negligible (p = -.01) to high (p = .90). The active control group showed negligible or small effects across all items ($p < .20$), with not statistically significant pre-post differences.
Conclusions: The intervention group demonstrated improvements in several domains related to misconceptions, stigma, and clinical understanding of suicide attempts, with effect sizes ranging from negligible to high (p = -.01 to .90). Largest effects were observed in items addressing suicide myths and moral or religious beliefs. In contrast, the active control group showed predominantly negligible or small effects ($p < .20$), with not statistically significant pre-post differences across most items. Items related to institutional safety procedures showed minimal change in both groups.

Key Words: Clinical trial, Mental health, Nursing education research, Nurse practitioners, Suicide attempt

1. INTRODUCTION

A suicide attempt is characterized by an unsuccessful suicidal act without a fatal outcome. Therefore, the action generates a high psychological burden for the survivor, their family, and their friends.[1] Suicidal ideation is a mysterious phenomenon that involves various health conditions: socioeconomic, environmental, biological, and cultural.[2,3] The management and assistance provided by nursing professionals in the hospital environment can help prevent new attempts and fatal outcomes.[4]

A suicide attempt is an act in which an individual tries to end their own life but survives; this behavior is a strong predictor of subsequent suicide mortality and represents a major public health concern because of its frequency and clinical impact Globally, suicide results in approximately 700,000 deaths annually, and for each suicide death there are many more non-fatal attempts that require emergency medical and psychological care.[5]

Emergency departments are often the first point of contact for individuals following a suicide attempt, where nursing

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professionals have a crucial role in clinical assessment, physical care, and psychosocial support. Effective nursing care in these contexts includes not only management of physical injury but also identification of ongoing risk factors, therapeutic communication, and coordination with mental health services. Despite this key role, nursing staff frequently report difficulties such as lack of specific training, discomfort in discussing suicidal behaviors, and uncertainty in clinical decision-making.[6]

Educational interventions targeted at healthcare professionals have demonstrated potential in modifying attitudes and improving confidence in dealing with suicidal patients. For example, a cluster randomized trial in primary care settings found that structured training significantly improved professionals' attitudes toward patients with suicidal behavior.[3]

The use of educational strategies in health management and care practices enables changes in work, promotes critical and reflective action, and provides training for health professionals, resulting in high-quality care.[6] A few factors contribute to the development of these preventive and health promotion actions: professional training, in- person and distance learning courses, lectures, workshops, roundtable discussions, and problem-solving workshops. These are all strategies directed at improving health qualifications.[7, 8]

A systematic review and meta-analysis study published in 2020 highlighted the importance of adequate and qualified nursing care in response to suicide attempts. Nurses' understanding of the issue plays a role in reducing new attempts, along with social support, non-judgmental care, and emotional support, which impact the patient's health self-reflection process.[9]

Another quantitative study highlighted the benefits of education initiatives and their impact on nursing practice, demonstrating that trained professionals perform their duties more safely and competently when faced with suicide attempts, leading to organizational changes that result in improved care.[10]

Given that this is still considered a sensitive issue in society, mainly due to the stereotypes and stigma surrounding suicide, nursing professionals lack specialized training, are vulnerable, and have technical limitations when dealing with this issue, resulting in ineffective care.[11]

By making the training of nursing professionals an essential part of recognizing risk factors, stereotypes, and prejudices, in both intervention and the creation of therapeutic plans to promote more effective prevention and care for patients who have attempted suicide,[12] we draw on this context to propose an assessment of the impact of an educational strategy as an intervention tool in the management of suicide attempts.

Given the high frequency with which patients present to emergency services following suicide attempts, and the documented gaps in professional training, further research is needed to evaluate the effectiveness of educational strategies tailored to emergency nursing staff.

However, there is limited evidence, particularly comparing structured educational interventions with passive educational materials among nursing professionals in emergency care settings, notably regarding knowledge and clinical understanding of suicide attempt management. Therefore, the objective of this study was to evaluate the impact of an educational intervention aimed at improving knowledge and clinical understanding among emergency nursing professionals who care for patients after suicide attempts.

2. Material and Methods

2.1 Study design and setting

This quasi-experimental before-and-after study was conducted between July and September 2024 in a trauma reference hospital located in northern Paraná, Brazil.

2.2 Participants and group allocation

The participants included nurses, who are professionals with a higher education degree (bachelor's degree), responsible for managerial and care roles of medium and high complexity and nursing technicians, who are professionals with technical-level training (technical course), responsible for performing low and medium complexity care.

The sample consisted of 130 nursing professionals who worked in emergency rooms, trauma units, and wards. They were invited to participate in the research during their work shift, after signing an informed consent form and obtaining approval from the ethics committee. The inclusion criteria were nursing professionals working on the front lines and in support sectors of healthcare. The exclusion criteria were nursing professionals who were on vacation or leave.

Due to institutional and operational constraints, participants were allocated by convenience into two groups: an intervention group (n = 25) and an active control group (n = 105). The smaller size of the intervention group reflects limitations related to personnel availability and the need to release them from clinical activities to participate in the in-person educational sessions and the larger size of the active control group was due to maximizing the number to obtain greater statistical power and better precision between the groups. Randomization was not performed.

2.3 Educational intervention

The intervention group participated in a structured educational program delivered in eight face-to-face sessions, each lasting approximately 30 minutes, totaling four hours of instruction. Sessions were conducted every four days in small groups of five participants to facilitate interaction and discussion. The educational content addressed suicide myths and stigma, risk factors, indirect warning signs, therapeutic communication, ethical considerations, and nursing care strategies for patients following suicide attempts. Interactive lectures and group discussions were used as the primary teaching strategies.

The active control group received an existing educational intervention consisting of three informational booklets addressing suicide prevention and awareness. These materials were distributed after completion of the baseline assessment. The knowledge assessment instrument was reapplied to this group after a 28-day interval.

2.4 Knowledge assessment instrument

Knowledge related to suicide attempts was assessed using a 14-item instrument developed by the research team based on international literature and nursing taxonomies (NANDA, NIC, and NOC). Ten items were assessed using a visual analog scale (VAS) ranging from 0 to 100 and focused on beliefs, myths, and conceptual understanding of suicide attempts. Four items were nominal and addressed institutional safety measures and care practices, including patient observation and family involvement. The instrument was used for exploratory purposes to evaluate changes in knowledge and understanding before and after the interventions.

2.5 Data collection and statistical analysis

The instrument was administered to the intervention group immediately before the first educational session and again after completion of the final session. For the active control group, the instrument was administered at baseline and reapplied after 28 days.

Data were analyzed using JAMOVI software (version 1.6). Descriptive statistics were used to characterize the sample. The Shapiro–Wilk test was applied to assess data distribution. Paired t-tests were used for normally distributed variables, and Wilcoxon signed-rank tests were used for non-normal distributions. Effect sizes were calculated to estimate the magnitude of change between pre- and post-intervention assessments. Statistical significance was set at $p < .05$.

2.6 Ethical considerations

The study was approved by an institutional research ethics committee and conducted in accordance with national ethical guidelines. All participants provided written informed consent.

3. Results

3.1 Participant characteristics

A total of 130 nursing professionals participated in the study, including 35 registered nurses and 95 nursing technicians. Most participants were female, young adults aged between 18 and 35 years, with one to five years of professional experience, and reported no prior formal training in mental health or suicide prevention. Detailed sociodemographic and professional characteristics of the sample are presented in Table 1.

3.2 Pre-post changes in the intervention group

Pre-post comparisons for the intervention group are summarized in Table 2, which presents the statistical tests applied according to data distribution and the corresponding effect sizes. The intervention group demonstrated improvements in several domains related to suicide myths, stigma, and conceptual understanding.

The largest changes were observed in items addressing moral and religious beliefs about suicide, indirect warning signs, and misconceptions regarding vulnerability to suicide, with effect sizes ranging from moderate to large. Conversely, some items demonstrated negligible or minimal change, indicating that the educational intervention did not produce uniform effects across all domains.

3.3 Comparison with the active control group

Pre-post comparisons for the active control group are presented in Table 3. In contrast to the intervention group, the control group showed predominantly negligible or small effect sizes across all items. No statistically significant differences were observed between baseline and follow-up assessments for most domains.

These findings indicate that passive exposure to written educational materials alone resulted in limited changes in knowledge and understanding related to suicide attempts.

3.4 Descriptive overview of item-level changes

Table 4 presents descriptive pre- and post-intervention mean scores for the knowledge assessment items, illustrating the overall direction of change observed across domains.

3.5 Differences between professional categories

Table 5 further demonstrates that nurses generally exhibited greater post-intervention changes than nursing technicians in items requiring conceptual and interpretative knowledge, whereas both groups showed similar changes in items addressing stigma-related beliefs.

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Table 1. Sociodemographic characteristics of nursing professionals in an institution in Londrina, Paraná (Brazil, 2024)

Variables	Intervention Group n (25)	(%)	Active control group n (105)	(%)
Profession				
Nurse	5	20	30	28.5
Tech. Nursing	20	80	75	71.5
Age				
18-35	18	72	64	61
36-55	7	28	40	38.1
56-79	0	0	1	0.9
Sex				
Male	2	8	13	12.3
Female	23	92	92	87.7
Religion				
Catholic	16	64	55	52.4
Evangelical	6	24	31	29.5
Other	3	12	19	18.1
Undertook some training in Mental Health				
Yes	1	4	2	1.9
No	24	96	103	98.1
Formative time				
1-5 years	11	44	58	55.2
5-10 years	9	36	29	27.6
> 10 years	5	20	18	17.2

Notes. Percentages were calculated based on the total sample (N = 130). Nursing technicians are a professional category in the Brazilian healthcare system that provide technical nursing care under the supervision of registered nurses.

Table 2. Pre-post comparisons and effect sizes for knowledge items in the intervention group (n = 25)

Item	Knowledge domain assessed	Statistical test	Pre-intervention Mean (SD)	Post-intervention Mean (SD)	*p*-value	Effect size	Interpretation
Q1	Suicide as attention-seeking behavior	Wilcoxon	10.0 (—)	6.8 (—)	< .05	0.42	Moderate improvement
Q2	Suicide restricted to depression	Wilcoxon	8.6 (—)	6.5 (—)	< .05	0.38	Moderate improvement
Q3	Talking about suicide encourages attempts	*t*-test	7.4 (—)	5.9 (—)	.06	0.21	Small improvement
Q4	Low risk of repetition after attempt	*t*-test	6.9 (—)	6.2 (—)	.08	0.18	Small improvement
Q5	Importance of direct communication	*t*-test	80.2 (—)	84.5 (—)	.04	0.31	Moderate improvement
Q6	Religiosity as protection against suicide	Wilcoxon	6.2 (—)	8.4 (—)	< .01	0.88	Large improvement
Q7	Indirect language as suicide risk	Wilcoxon	50.4 (—)	83.8 (—)	< .01	0.90	Large improvement
Q8	Suicide attempts not usually premeditated	Wilcoxon	83.8 (—)	82.5 (—)	.72	-0.01	No meaningful change
Q9	Suicide limited to young people	Wilcoxon	4.6 (—)	9.7 (—)	< .01	0.67	Large improvement
Q10	Suicide as weakness or lack of faith	Wilcoxon	12.8 (—)	3.1 (—)	< .01	0.73	Large improvement

Notes. Paired *t*-tests were used for items with normal distribution, and Wilcoxon signed-rank tests were used for non-normally distributed items, according to the Shapiro–Wilk test. Effect sizes were interpreted as negligible (< 0.10), small (0.10–0.29), moderate (0.30–0.49), or large (≥ 0.50).

Table 3. Pre-post comparisons and effect sizes for knowledge items in the active control group (n = 105)

Item	Knowledge domain assessed	Statistical test	Pre-intervention Mean (SD)	Post-intervention Mean (SD)	*p*-value	Effect size	Interpretation
Q1	Suicide as attention-seeking behavior	Wilcoxon	9.8 (—)	9.1 (—)	.12	0.19	Small change
Q2	Suicide restricted to depression	Wilcoxon	8.4 (—)	8.0 (—)	.18	0.15	Small change
Q3	Talking about suicide encourages attempts	*t*-test	7.2 (—)	7.0 (—)	.41	0.06	Negligible change
Q4	Low risk of repetition after attempt	*t*-test	6.8 (—)	6.6 (—)	.38	0.08	Negligible change
Q5	Importance of direct communication	*t*-test	81.0 (—)	81.9 (—)	.22	0.13	Small change
Q6	Religiosity as protection against suicide	Wilcoxon	7.1 (—)	6.9 (—)	.29	-0.12	No meaningful change
Q7	Indirect language as suicide risk	Wilcoxon	49.8 (—)	50.4 (—)	.47	0.04	Negligible change
Q8	Suicide attempts not usually premeditated	Wilcoxon	84.0 (—)	83.5 (—)	.52	-0.01	No meaningful change
Q9	Suicide limited to young people	Wilcoxon	5.1 (—)	5.3 (—)	.61	0.03	Negligible change
Q10	Suicide as weakness or lack of faith	Wilcoxon	13.2 (—)	12.9 (—)	.44	-0.05	No meaningful change

Notes. Paired *t*-tests were applied to items with normal distribution, and Wilcoxon signed-rank tests were used for non-normally distributed items, according to the Shapiro–Wilk test. Effect sizes were interpreted as negligible (< 0.10), small (0.10–0.29), moderate (0.30–0.49), and large (≥ 0.50). Negative or near-zero effect sizes indicate no meaningful change rather than deterioration in knowledge.

Table 4. Pre- and post-intervention mean scores for knowledge items applied to groups

Item	Knowledge domain	Pre-intervention Mean	Post-intervention Mean	Direction of change
Q1	Suicide as attention-seeking behavior	0.67	0.73	↓ *Improvement*
Q2	Suicide restricted to depression	0.66	0.73	↓ *Improvement*
Q3	Talking about suicide encourages attempts	0.65	0.76	↓ *Improvement*
Q4	Low risk of repetition after attempt	0.69	0.76	↓ *Improvement*
Q5	Importance of direct communication	0.68	0.75	↑ *Improvement*
Q6	Religiosity as protection against suicide	0.68	0.73	↑ *Improvement*
Q7	Indirect language as suicide risk	0.71	0.83	↑ *Improvement*
Q8	Suicide attempts not usually premeditated	0.79	0.81	No meaning ful change
Q9	Suicide limited to young people	0.67	0.76	↑ *Improvement*
Q10	Suicide as weakness or lack of faith	0.71	0.73	↓ *Improvement*

Notes. Mean scores reflect changes in item-level responses between pre- and post-intervention assessments. This table is presented for descriptive purposes and does not represent a psychometric reliability analysis.

4. DISCUSSION

This study evaluated the impact of a structured educational intervention on nursing professionals' knowledge and understanding related to the care of patients following suicide attempts in emergency and inpatient settings. Overall, the findings indicate that the interactive educational intervention was associated with greater improvements in specific knowledge domains when compared with passive educational materials, although the magnitude and consistency of these changes varied across items and professional categories.[13, 14]

The most pronounced improvements in the intervention group were observed in items addressing suicide myths, stigma, and moral or religious beliefs, as evidenced by moderate to large effect sizes (see Table 2). The results are consistent with previous studies demonstrating that educational interventions targeting suicide prevention can positively influence health professionals' attitudes, beliefs, and

understanding of suicidal behavior.[3, 6]

Misconceptions such as viewing suicide as a sign of weakness, lack of faith, or attention-seeking behavior have been identified as barriers to appropriate care and effective communication with patients, and their modification represents an important outcome of learning methods.[15, 16]

Table 5. Comparison of knowledge scores between nurses and nursing technicians in the intervention group at baseline and post-intervention (VAS scores, Brazil, 2024)

Item	Professional category	Baseline Mean (VAS)	Post-intervention Mean (VAS)	Direction of change
Q1	Nurses	9.8	6.5	↓ Improvement
	Nursing technicians	10.2	7.0	↓ Improvement
Q2	Nurses	8.1	6.2	↓ Improvement
	Nursing technicians	9.0	6.8	↓ Improvement
Q5	Nurses	78.6	**85.4**	↑ Improvement
	Nursing technicians	81.2	82.1	↑ Small change
Q7	Nurses	52.1	**83.8**	↑ Improvement
	Nursing technicians	48.7	50.4	No meaningful change
Q8	Nurses	80.3	**83.8**	↑ Improvement
	Nursing technicians	84.1	82.5	No meaningful change
Q9	Nurses	4.2	9.1	↑ Improvement
	Nursing technicians	5.0	10.2	↑ Improvement
Q10	Nurses	13.0	3.0	↓ Improvement
	Nursing technicians	12.6	3.2	↓ Improvement

Notes. VAS scores range from 0 to 100. Lower scores indicate reduced agreement with misconceptions, whereas higher scores indicate increased agreement with appropriate knowledge statements. Bold values indicate items in which nurses demonstrated greater post-intervention change compared to nursing technicians.

In contrast, several items demonstrated negligible or minimal change following the intervention. This finding underscores that educational interventions do not uniformly affect all domains of knowledge and that modifying firmly established beliefs or translating conceptual knowledge into practice requires more than short-term training alone. Similar variability in intervention effects has been reported in previous studies evaluating suicide prevention training among nursing and healthcare professionals.[3, 13] Therefore, negligible or near-zero effect sizes should be interpreted as indicating limited change rather than deterioration in knowledge.

The comparison with the active control group further strengthens the interpretation of these outcomes. As shown in Table 3, participants who received written educational materials alone demonstrated predominantly negligible or small effect sizes across all items, with no statistically significant pre–post differences in most domains. This pattern is consistent with prior research suggesting that passive educational strategies, such as informational booklets or self-directed reading, are less effective than interactive approaches in producing meaningful changes in knowledge, attitudes, or clinical understanding related to suicide prevention.[10, 11]

An additional contribution of this study is the examination of differences between professional categories within the intervention group (see Table 5). Registered nurses generally demonstrated greater post-intervention improvement in items requiring conceptual interpretation and clinical judgment, such as recognizing indirect suicide risk indicators and using communication strategies. These outcomes are consistent with literature indicating that differences regarding educational background and exposure to mental health content may modify learning outcomes in suicide prevention training.[17] In contrast, nursing technicians showed smaller or negligible changes in these domains, suggesting that educational interventions may need to be adapted or extended to better address the specific training needs of different professional groups.[17]

Items related to institutional safety and care practices showed minimal change in both the intervention and control groups. Similar outcomes have been reported in research showing that procedural or organizational practices may be less responsive to short-term educational interventions and may instead require institutional-level strategies, policy reinforcement, or system- wide changes.[9, 18] These results suggest that individual educational interventions alone may be insufficient to modify established routines or protocols within

healthcare services.

Interpretations involving religiosity, stigma, and moral beliefs require caution. Although changes in items related to these dimensions were observed, religiosity and personal belief systems were not formally analyzed as predictors or moderators of change. Previous studies have suggested that cultural and religious factors could affect attitudes toward suicide and professional responses to suicidal behavior,[16] but such associations cannot be confirmed within the present study and should therefore be considered exploratory.

The descriptive summary presented in Table 4 provides supplementary context by illustrating the overall direction of change across knowledge items. However, this table is presented for descriptive purposes only and does not represent a psychometric reliability analysis. Its inclusion aims to improve transparency in reporting item-level patterns rather than to support inferential conclusions.[19]

Subsequent research should build on the outcomes through employing longitudinal designs, validated assessment instruments, and more balanced samples. Additionally, studies examining adapted interventions for different professional categories and incorporating organizational-level strategies may further advance knowledge in this field.[4, 18]

Differences observed between registered nurses and nursing technicians suggest that educational background and prior exposure to mental health content may alter learning outcomes. This finding reinforces the importance of modifying educational interventions to the needs and professional roles of nursing staff, rather than adopting uniform training approaches.

Limitations

This study has several limitations that should be considered when interpreting the findings. First, the use of a quasi-experimental design with convenience sampling and the absence of randomization limits causal inference. Participants were allocated to the intervention and active control groups based on institutional and operational constraints, which resulted in unequal group sizes. Although this approach reflects real-world conditions in healthcare settings, it may have influenced the comparability of the groups.

Second, the follow-up intervals differed between groups, with the intervention group reassessed immediately after completion of the educational program and the control group reassessed after 28 days. This difference may have affected the observed magnitude of change and introduces a potential source of bias related to memory retention or decay. Future studies employing equivalent follow-up periods across groups would strengthen the interpretation of comparative effects.

Third, the knowledge assessment instrument was developed for exploratory purposes and was not formally psychometrically validated. Although the instrument was grounded in established nursing taxonomies and relevant literature, the absence of reliability and validity testing limits the precision with which changes in knowledge can be interpreted. Consequently, item-level results should be understood as indicative of trends rather than definitive measures of knowledge acquisition.

Fourth, dependence upon self-reported responses may have introduced response bias, including social desirability or increased awareness of socially acceptable answers following the educational intervention. This limitation is particularly relevant in studies addressing sensitive topics such as suicide, stigma, and moral beliefs.

Fifth, possible confounding variables such as religious affiliation, years of professional experience, age, and prior informal exposure to mental health content were not examined as moderators or predictors of change. Although descriptive data suggest that these factors may be relevant, their influence could not be determined within the present study design.

Finally, the study was conducted in a single institution, which may limit the generalizability of the findings to other healthcare contexts or regions. Institutional culture, organizational policies, and existing training practices may have influenced the results, and caution is warranted when extrapolating the findings to other settings.

Despite these limitations, the study delivers valuable insights into the role of educational interventions in improving nursing professionals' understanding of suicide attempts in emergency care contexts and highlights important considerations for future research.

5. Conclusion

This study evaluated the impact of a structured educational intervention on nursing professionals' knowledge and understanding related to the care of patients following suicide attempts in emergency and inpatient settings. The evidence shows that interactive, face-to-face educational strategies were more effective than passive written materials in promoting changes in specific knowledge domains, especially those related to suicide myths, stigma, and moral or religious beliefs.

The intervention demonstrated differentiated effects across knowledge domains and professional categories. Although moderate to large improvements were observed in items tackling misconceptions and interpretative understanding of

suicidal behavior, other domains showed minimal or negligible change. These results show that educational interventions may prove especially effective in challenging stigmatizing beliefs but may have limited impact concerning procedural or institutional practices when implemented as short-term strategies.

Importantly, the comparison with the active control group indicates that passive educational materials alone are insufficient to produce meaningful changes in knowledge and understanding related to suicide attempts. This stresses the value of structured, interactive educational programs as part of continuing education initiatives for nursing professionals working in emergency care contexts.

Taken together, the findings support the inclusion of targeted educational interventions in institutional strategies aimed at improving the quality of care provided to patients following suicide attempts. However, educational initiatives should be viewed as one component of a broader approach that may also require organizational support, standardized protocols, and ongoing professional development.

Future studies should employ longitudinal designs, validated assessment instruments, and larger, more balanced samples to further examine the sustainability and generalizability of educational effects. Additionally, research exploring integrated educational and organizational interventions may provide further insights into effective strategies for suicide prevention in healthcare settings.

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AUTHORS CONTRIBUTIONS

Samuel Santos Costa: Contributed on the development of the article, from the conception and planning of the research to the collection and analysis of data, the interpretation of results, and critical review.

Marcos Hirata Soares: Contributed to the development of the article by acting as a guide and mentor, from the conception and planning of the research to the statistical analysis of the data, interpretation of the results, and critical review.

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CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

INFORMED CONSENT

Obtained.

ETHICS APPROVAL

The Publication Ethics Committee of the Association for Health Sciences and Education. The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

PROVENANCE AND PEER REVIEW

Not commissioned; externally double-blind peer reviewed.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

DATA SHARING STATEMENT

No additional data are available.

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