Effect of Problem-based Learning versus Role Play on Knowledge of Managing Aggressive Patient among Staff Nurses in a selected Hospital in Kolkata

Kakali Malik

Department of Mental Health Nursing, College of Nursing, Medical College and Hospital, The West Bengal University of Health Sciences, West Bengal, Kolkata, India

Abstract

Aim: The aim of the study is to evaluate the problem-based learning's (PBL) efficacy versus role play (RP) on the knowledge of managing aggressive patients among staff nurses.

Introduction: Managing aggressive patients is critical in health-care settings, necessitating effective training methods to enhance nurses' skills. The study is grounded in the system model of Theorist Ludwig Von Bertalanffy.

Materials and Methods: A non-equivalent pre- and post-test design was used utilizing purposive sampling of sixty nursing staff. Samples were given a validated and reliable (r = 0.89) knowledge questionnaire. Following the pre-test, PBL was introduced first group and RP to the other. Post-test was conducted on the 8th day. Paired "t" tests compared each group's pre- and post-test results.

Results: Both PBL and RP effectively enhanced knowledge. The value of paired "t" for the PBL group was 37.57 [$t(29) = 2.05$; $P < 0.05$], improving from a pre-test mean of 11.1–19.8 post-test. The RP group's paired "t" value was 25.04 [$t(29) = 2.05$; $P < 0.05$], improving from 10.6 to 17.6. An unpaired "t" test showed that PBL was more effective than RP, with a "t" value of 4.67 [$t(58) = 2.00$; $P < 0.05$]. There was no significant association between pre-test scores and demographic variables.

Conclusion: PBL was superior to RP in improving staff nurses' knowledge of managing aggressive patients. Future research should explore PBL in clinical settings and other educational methods alongside PBL and RP.

Keywords: Management of aggressive patients, Nursing education, Problem-based learning, Roleplay, Staff nurses

INTRODUCTION

Aggression and violence pose significant challenges in health-care settings, particularly in psychiatric care, where they have serious adverse effects on the health, well-being, and safety of both patients and health-care providers. Effective management strategies are essential to mitigate these risks and improve the overall environment in psychiatric facilities.[1]

The prevalence of aggressive behavior in psychiatric wards can vary significantly, ranging from 8% to 76%. Various factors contribute to these aggressive behaviors, which are categorized into patient-related, staff-related, and ward-related factors. Patient-related risk factors include diagnoses such as psychotic or bipolar disorders, substance misuse, a medical history of aggression, and young age. Staff-related risk factors encompass male gender, temporary or unqualified employees, work-related stress, job discontent,

Address for Correspondence:
Kakali Malik, College of Nursing, Medical College and Hospital, The West Bengal University of Health Sciences, West Bengal, Kolkata, India.
E-mail: kakalimalik1984@gmail.com

or management, burnout, and the standard of interactions between staff and patients.[2]

Aggression in psychiatric settings poses substantial challenges, not only for the affected patients but also for mental health professionals. Inpatient aggression may result in considerable costs,[3] including physical harm to staff and other patients, increased need for restraints or seclusion,[4] and extended hospital stays. Anger is identified as a crucial risk factor for aggression, yet research into its components is limited. Furthermore, the role of nursing staff in the management of anger in aggressive patients is poorly understood, highlighting the need for further exploration in this area.[5]

Nursing staff are essential in managing aggressive behavior in psychiatric settings, with their ability to recognize early signs, use de-escalation techniques, and implement interventions being crucial. However, psychiatric nursing often faces criticism for lacking autonomy and aligning too closely with the medical model, which leads to unclear roles and marginalized status. This marginalization complicates the application of effective care models and causes confusion among patients about their care. Effective leadership is vital in addressing these challenges by enhancing nursing practice and ensuring alignment with core nursing values. Strong leadership can foster collaboration, improve role clarity, and motivate staff toward a shared vision of care. Understanding the varied perceptions of nursing roles among staff can help in establishing this shared vision and improving patient care.[6] Training programs focused on enhancing these skills are essential for enhancing patient outcomes and guaranteeing health-care providers' and patients' safety. Understanding and improving strategies for managing aggression are also essential.[7]

Problem-based learning is pivotal in educating the nurses as it fosters solving the problems, critical thinking, and self-directed learning abilities essential for efficient clinical practice. By engaging students in real-world scenarios, problem-based learning (PBL) enhances their competence and readiness for complex patient care challenges.[8]

Role play (RP) in nursing is essential for enhancing therapeutic communication by simulating real-life interactions between nurses and patients, which helps in developing skills such as empathy, respect, and honesty. This practice not only fosters trust and understanding but also equips nurses to manage interpersonal conflicts and implement effective therapeutic outcomes.[9]

Statement of the problem

Existing training methods for staff nurses in handling aggressive behavior are varied, but there is a lack of comparative research on their effectiveness. This study investigates the comparative impact of PBL and RP in enhancing knowledge in managing aggressive patients among staff nurses at a hospital in Kolkata.

Study objectives

1. Determine the knowledge score of staff nurses regarding the management of aggressive patients before and after implementation of the PBL.

2. Assess the knowledge score of staff nurses regarding the management of aggressive patients before and after implementation of RP.
3. To determine the outcome of PBL versus RP in terms of significant changes in the knowledge of nurses regarding the management of aggressive patients.
4. To investigate the association between pre-test knowledge results and specific demographic variables.

Hypotheses

The aim of the study is to evaluate the effectiveness of problem-based learning and RP on knowledge of managing aggressive patients among staff nurses. Three main hypotheses were formulated:

H_1- There is a significant difference in mean pre-test knowledge scores on managing aggressive patients between staff nurses in the PBL group and the RP group.

H_2- The mean post-test knowledge score of staff nurses is significantly higher after problem-based learning compared to their pre-test knowledge score.

H_3- The mean post-test knowledge score of staff nurses is significantly higher after the RP intervention compared to their pre-test knowledge score.

H_4- There is a significant difference in mean post-test knowledge scores on managing aggressive patients between staff nurses in the PBL group and the RP group.

To test these hypotheses, corresponding null hypotheses were stated, asserting no significant differences in knowledge scores between groups or between pre- and post-test measurements within each group. These hypotheses were tested at the 0.05 level of significance.

RESEARCH METHODOLOGY

Research Approach: A quasi-experimental research approach was used in the study
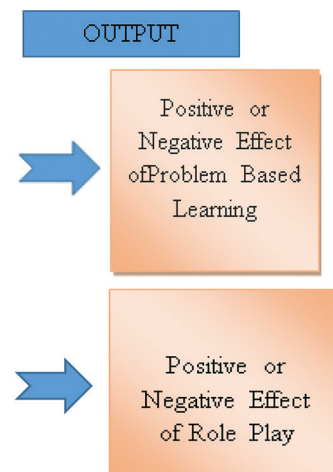
Research design

A non-equivalent pre- and post-test design.

Design details

For the PBL group, knowledge was assessed before (K1) and after (K2) the PBL intervention (X1). Similarly, the RP group's knowledge was assessed before (K3) and after (K4) the RP intervention (X2).

Setting of the study

Data collection took place in specific ward:
- PBL Method: Pavlov Male Psychiatry Ward
- RP Method: Pavlov Female Psychiatry Ward.

Population

Staff nurses working at Calcutta Pavlov Hospital.

Sample size

60 nursing staff (30 in the PBL group and 30 in RP group).

Sampling technique

Purposive sampling with a total enumeration of all eligible staff nurses out of 79.

Inclusion and exclusion criteria

The sample consists of male and female nurses directly providing patient care with general nursing and midwifery qualifications who showed willingness and provided consent to take part in the study. Staff nurses having higher qualifications were excluded from the study.

Data collection tools and techniques

The demographic data were collected using an interview schedule (Section-A). Variables assessed include gender, age, religion, academic education, marital status, years of nursing service experience, and attendance at workshops/seminars while knowledge of managing aggressive patients was assessed with a structured questionnaire (Section-B). Modules for both PBL and RP were developed and administered, with pre- and post-tests conducted to evaluate knowledge improvement.

Statistics

- Descriptive Statistics: Mean, standard deviation, frequency, and percentage were used.
- Inferential Statistics: Paired and unpaired "t" tests were applied.

RESULTS

Demographic findings

In the study, most of the PBL group participants (77%) and RP group (43%) were aged 20–29 years. The PBL group had a predominance of male participants (80%), whereas the RP group consisted entirely of females (100%). Most participants in both groups were Hindu, with 100% in PBL group and 97% in the RP group. The PBL group had a higher proportion of single participants (77%), compared to the RP group, which had 73% of married participants. A significant number of respondents in the PBL group (87%) and the RP group (67%) had basic education up to higher secondary. In terms of work experience, 53% of the PBL group had less than 1 year of

nursing experience, while 50% of the RP group had 1–5 years of experience. In addition, attendance at workshops/seminars was low, with 13.33% in the PBL group and 30% in RP group having participated.

Data presented in Table 1 show that the mean pre-test knowledge score (11.10) of the nursing staff of the PBL group exceeds the average knowledge score from the pre-test (10.60) of RP group with a difference of 0.5 in the mean scores of both groups, which is not statistically significant as evident from "t" value of 1.34 which is less than the table value (2.00) for df (58) at 0.05 level of significance. It depicts that the obtained mean difference is not true difference but by chance. Thus, the null hypothesis is accepted and the research hypothesis (H_1) is rejected.

Therefore, it could be interpreted that, the nursing staff of the PBL group and RP group are homogenous, that is drawn from the same population.

Table 2 represents the comparison of mean knowledge scores within the PBL group before and after the intervention. The mean knowledge score before the test was 11.10 with a standard deviation of 1.49, and the mean knowledge score after the intervention was 19.86 with a standard deviation of 1.73. The pre- and post-test mean differences in scores were 8.76. The paired "t" test value was 37.57, which is significant at the 0.05 level, indicating a substantial increase in knowledge after the PBL intervention (t(df=29)=2.05; $P < 0.05$). This demonstrates that problem-based learning effectively enhanced the knowledge of staff nurses regarding aggressive patient management.[10-12]

Table 3 represents the comparison of mean knowledge scores within the RP group before and after the intervention. The mean knowledge score before the test was 10.60 with a standard deviation of 1.35, and the post-test mean knowledge score was 17.60 with a standard deviation of 1.97. The pre- and post-test mean difference in scores was 7.00. The paired "t" test value was 25.04*, which is significant at the 0.05 level, indicating a substantial increase in knowledge after the RP intervention (t(df=29)=2.05; $P < 0.05$). This demonstrates that RP

Table 1: Comparison between the pre-test knowledge scores of PBL group and role play group $n=30$

Group	Mean pre-test knowledge score	Mean difference	Standard deviation	Unpaired "t" value
PBL group	11.10	0.5	1.49	1.34
Role play group	10.60		1.35	

Table 2: Comparison between the pre- and post-test knowledge scores within PBL group $n=30$

Test	Mean knowledge score of PBL group	Mean difference	Standard deviation	Paired "t" value
Pre-test	11.10	8.76	1.49	37.57
Post-test	19.86		1.73	

effectively enhanced the knowledge of staff nurses related to the management of aggressive patients. Many research studies have demonstrated that role-playing is a useful technique for enhancing knowledge and skills in various areas.[13-15]

Data presented in Table 4 indicate that the mean knowledge score of the post-test for the PBL group (19.86) is significantly greater than the mean post-test knowledge score for the RP group (17.60), the difference between means is 2.26. This difference is statistically significant, as demonstrated by an independent t-test result of 4.67, which exceeds the critical t-value of 2.00(df=58) at the 0.05 significance level. The significant t-value confirms that the observed mean difference is a true effect rather than due to chance. Consequently, we reject the null hypothesis and accept the research hypothesis (H4). This finding suggests that the problem-based learning intervention is more effective in significantly improving the knowledge of nursing staff when compared to the RP method.

Association between pre-test knowledge results and specific demographic variables

The study found no significant associations between pre-test knowledge scores and selected demographic variables among nursing staff. Specifically, the association between pre-test knowledge scores and age was non-significant in both the PBL group (χ^2=1.63; p>0.05) and the RP group (χ^2=0.17; p>0.05). Similarly, the association between pre-test knowledge scores and gender in the PBL group was non-significant (χ^2=0.68; p>0.05). In addition, the association between pre-test knowledge scores and years of nursing experience was non-significant in both the PBL group (χ^2=0.10; p>0.05) and the RP group (χ^2=0.13; p>0.05). These findings indicate that the initial knowledge levels of managing aggressive patients were not influenced by age, gender, or years of nursing experience

Knowledge improvement in nursing staff: A comparison of PBL and RP methods

Data presented in Figure 1 illustrate significant improvements in knowledge scores across various areas of nursing education both before and following the intervention in the PBL Group.

Table 3: Comparison of pre-and post-test knowledge scores within the role play group *n*=30

Test	Mean knowledge score of PBL group	Mean difference	Standard deviation	Paired "t" value
Pre-test	10.60	7.00	1.35	25.04
Post-test	17.60		19.7	

Table 4: Comparison of post-test knowledge scores between PBL group and role play group *n*=30

Group	Mean post-test knowledge score	Mean difference	Standard deviation	Unpaired "t" value
PBL Group	19.86	2.26	1.73	4.67
Role Play Group	17.60		1.97	

In the area of introduction, the score of pre-test knowledge was 71%, which became better than 94% in the post-test. For the concept of anger, aggression, and violence, staff nurses' pre-test score was 47%, rising to 80% post-test. Both general principles and prediction of aggression showed pre-test scores of 42%, with post-test scores improving to 82% and 73%, respectively. In the prevention category, the score of the pre-test was 43%, and the score of the post-test was increased to 83%. For management and evaluation, pre-test scores were 42.85% and 41%, which improved to 84.28% and 78% in the post-test. Overall, the nursing staff in the PBL group achieved knowledge levels exceeding 75% in all areas, except for the prediction of anger, following the PBL intervention.

Data presented in Figure 2 indicate notable improvements in knowledge scores among nursing staff in various areas following the RP intervention. In the introduction section, the pre-test knowledge score was 69%, which increased to 83% post-test. The concept of anger, aggression, and violence
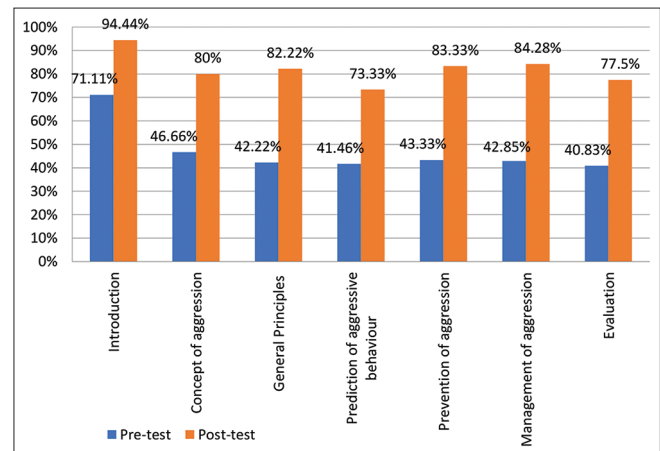

Figure 1: Mean knowledge score of pre- and post-test of the PBL group regarding managing aggressive patient
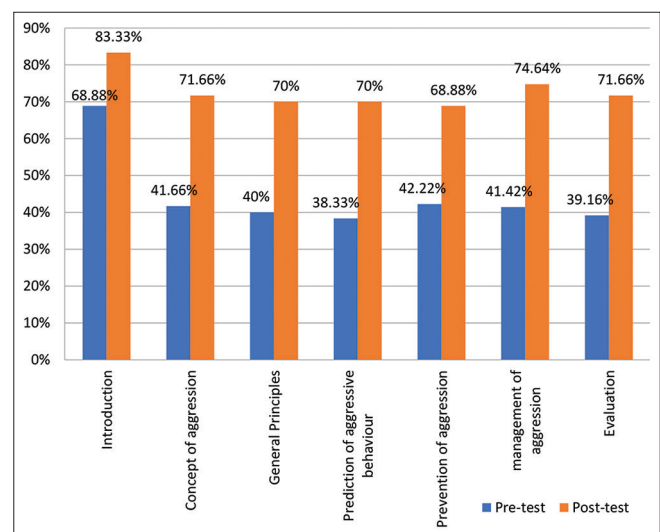

Figure 2: Mean knowledge score of pre- and post-test of the RP group regarding managing aggressive patient

showed a pre-test score of 42%, rising to 72% post-test. Both general principles and prediction of aggression had pre-test scores of 40% and 38%, respectively, with post-test scores improving to 70% in both categories. In prevention, pre-test scores were 42%, and post-test scores increased to 68%. For management and evaluation, pre-test scores were 41.42% and 39%, which improved to 74.76% and 72%, respectively. After the RP intervention, the nursing staff achieved adequate knowledge (<75%) only in the areas of introduction and management of aggression.

DISCUSSION

In comparing our findings with those from Thabet *et al*., both studies highlight the significant effectiveness of PBL in enhancing educational outcomes. Our study demonstrated that PBL led to a substantial increase in knowledge scores from 11.10 to 19.86, with a difference of 8.76 in the means and a paired "t" value of 37.57 ($P < 0.05$), indicating a robust improvement in knowledge related to patient management. Similarly, Thabet *et al*. reported a significant increase in decision-making skills scores from 71 ± 8.5 to 116.3 ± 10.4 ($P = 0.001$) following PBL. Although their study focused on decision-making skills rather than specific knowledge, both studies validate PBL's effectiveness, with our findings underscoring its impact on specific knowledge areas and Thabet *et al*.'s study demonstrating its broader applicability in skill development.[16]

When evaluating the RP method, our study's results align with those of Pourghaznein *et al*., who also found RP effectively advanced knowledge acquisition. The current research reported a significant increase in knowledge scores from 10.60 to 17.60, with a mean difference of 7.00 and a paired "t" value of 25.04 ($P < 0.05$). Pourghaznein *et al*. reported a post-test mean score of 16.13 ± 1.37 and a mean difference of 12.84 ± 1.43, which reinforces the efficacy of RP in enhancing knowledge. Despite methodological differences, both studies support RP's effectiveness in significantly improving knowledge.[17]

The comparative analysis between PBL and RP in our study revealed that PBL was more effective than RP, with a significant post-test mean knowledge score difference of 2.26 and an independent t-test value of 4.67 ($P < 0.05$). This finding is consistent with Sayyah *et al*.'s systematic review and meta-analysis, which showed a significant advantage of PBL over traditional lecture-based methods, with a standardized mean difference (SMD) of 0.80 for knowledge scores. Their review, encompassing data from 21 studies, supports our finding that PBL outperforms RP in enhancing knowledge.[18] This broader context reinforces our results, highlighting PBL's superiority in improving specific knowledge areas and overall academic performance compared to other methods.

Furthermore, the meta-analysis on PBL in Chinese medical schools supports our findings by demonstrating PBL's effectiveness in significantly enhancing both knowledge and skills, with SMDs of 0.76 for knowledge and 1.46 for skills.

This broader evidence base corroborates our results, indicating that PBL not only significantly improves knowledge but also excels over alternative methods such as RP in educational outcomes.[19] Both our study and the meta-analysis underscore PBL's effectiveness, reinforcing our conclusion that PBL is a superior educational strategy for enhancing nursing knowledge and skills.

CONCLUSION

Drawing conclusions from the study's findings, it can be said that both teaching methods have proven to be successful in enhancing nursing staff knowledge. However, it is observed that PBL works more efficiently to enhance the knowledge of nursing staff related to managing aggressive patients rather than RP. Future research should explore the application of PBL in different clinical settings and topics and consider other educational methods alongside PBL and RP.

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CONFLICTS OF INTEREST

A conflict of interest does not exist.

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