Fall prevention among psychiatric patients in an Iranian hospital: a best practice implementation project

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ABSTRACT

Introduction: Falls are the main cause of disability among psychiatric patients, as well as being the most common adverse event in hospitals.

Aim: The aim of this evidence implementation project was to improve fall prevention and management among psychiatric patients in a neurology ward in an Iranian tertiary psychiatric hospital.

Methods: This project used the JBI Evidence Implementation Framework, which recommends an audit, feedback, and re-audit strategy. A baseline audit was conducted to evaluate current fall prevention practices among 50 psychiatric patients and 20 health care professionals. The baseline audit was used to identify gaps in compliance. After the implementation of improvement strategies, a follow-up audit was conducted to measure any changes in practice.

Results: The baseline and follow-up audits revealed that compliance with best practices improved in ward transfer fall risk assessment (Criterion 2: 87% to 90%), patient participation in fall risk assessment (Criterion 3: 95% to 96%), revising patient fall risk status (Criterion 9: 50% to 86%), and person-centered education of health care providers (Criterion 11: 78% to 96%). Other audit criteria remained unchanged. However, for Criterion 6 on patient engagement in goal-setting and treatment planning, compliance dropped from 100% at baseline to 94% at follow-up.

Conclusions: This project successfully increased evidence-based practices regarding fall prevention and management, as well as providing mechanisms for sustaining the practice changes. Future audits are required to further improve outcomes.

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Keywords: evidence-based practice; falls; falls prevention; implementation science

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What is known about this topic?

- Falls in hospitals are an important concern for both patients and health care professionals.
- Fall prevention strategies should be tailored to each patient's condition and individual risks.
- A number of barriers and facilitators to fall prevention could affect patient outcomes and quality of care.

What does this paper add?

- Health care providers are not routinely educated about fall prevention.
- Barriers to best practice may include incomplete fall risk assessment during ward transfer, limited knowledge of fall prevention protocols, and lack of patient participation in the fall risk assessment.
- Strategies to improve compliance with evidence-based practices may include educational sessions and meetings.

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INTRODUCTION

The World Health Organization defines a fall in hospital as "an event that results in a person coming to rest inadvertently on the ground, floor, or lower level."[1] Falls are the most common global adverse patient safety concern in the hospital context, ranging from 3 to 11 falls per 1,000 beds per day worldwide.[2] Falling in a hospital usually results in fractures and soft-tissue injury as primary outcomes, and fear of falling, anxiety, distress, depression, and reduced physical activity as secondary outcomes.[2]

Patient-related risk factors associated with in-hospital falls include patient age, existence of comorbidities such as urinary incontinence or frequency, history of previous falls, gait, visual/auditory impairment, musculoskeletal deficits, and cognitive impairment. Extrinsic risk factors for falls include the context of the hospital, medications, supportive and assistive equipment in bathrooms, lighting, and footwear, all of which could lead to increased length of stay and increased use of health care resources.[3] Guidelines from the National Institute for Health and Care Excellence (NICE) in 2019 recommend recognizing at-risk inpatients, including the elderly, and preventing falls among those populations, which can lead to a 30% decrease in the fall rate.[4]

Fall prevention in hospitals is a multi-professional task that requires the engagement of all staff; however, the implementation of interventions is challenging.[5] In addition, leadership support at the level of the hospital director and front-line champions is critical for implementing fall prevention interventions.[6] Multifaceted fall prevention interventions include identifying risk, educating patients and staff, system and leadership-related interventions, modifying environmental factors such as removing obstacles, using assistive devices such as wristbands, therapeutic exercises, medication reviews, and optimizing patient nutrition.[7,8] According to an updated evidence report, three most commonly studied fall prevention interventions include comprehensive individualized falls risk assessment, exercise, and supplementation of Vitamin D.[9] Based on the results of another systematic review and network meta-analysis, quality improvement strategies such as patient education and exercise were associated with a reduced number of falls.[10]

One of the vital components of a fall prevention program is to assess the in-hospital fall risk of patients using fall risk assessment tools. Some of these tools have been evaluated for use in hospitals, such as the Morse Fall Scale (MFS), which consists of six items, including (1) recent fall within 3 months; (2) presence of co-morbidity; (3) use of an ambulatory aid such nurse assist/ crutches/cane/walker, and furniture; (4) IV heparin lock; (5) type of gait; and (6) mental status.[11] A score was allocated to each variable based on the calculated relative risk. Patients were assessed for the presence or absence of risk factors. Based on the total score, patients were categorized as having no risk (MFS score of 0–24), low risk (MFS score of 25–50), or high-risk (MFS score of $>$51).[12]

Adult patients receiving mental health services in psychiatric care have a fourfold higher risk of falling than the general population.[13] Patients with psychiatric conditions such as depression, psychosis, and schizophrenia have an increased risk of falling. Turner *et al.*[14] indicate that the risk of falling due to balance problems and confusion can also increase with psychotropic medications. The same study reports that the median fall rate for elderly patients in psychiatric care was 13.9 per 1,000 patients per day, compared with 6.8 falls per 1,000 per day for similar-aged patients in acute care hospitals. In addition, the median injurious fall rate was 5.5 per 1,000 patients per day in a psychiatric setting compared with 2.5 per 1,000 patients per day in acute care units.[14] A nationwide longitudinal study by Chu *et al.*[15] showed that the risk of falling and hip and vertebral fractures increased among patients with psychiatric disorders, indicating the importance of fall monitoring and associated fracture complications in the care of these patients.

To the best of our knowledge, few studies in Iran have examined falls in psychiatric units and implemented evidence-based strategies for preventing falls among these patients. One study showed that a 12-week simple balance training program reduced the risk of falling among elderly women in an Iranian psychiatric setting.[16] To implement best practices for fall prevention and management among psychiatric patients, an evidence implementation project was developed in a 25-bed neurology ward of a hospital in Tabriz, in northwest Iran. This tertiary reference hospital has 750 beds and provides services for patients with various psychiatric disorders.

We used the guidance of the JBI Evidence Implementation Framework[17] to conduct this project. We also used the JBI Practical Application of Clinical Evidence System (JBI PACES) audit and feedback tool, as well as the JBI Getting Research into Practice (GRiP)

strategy to promote evidence-based practices for fall prevention among psychiatric patients. Best practice recommendations were derived from a JBI evidence summary that was published by Lizarondo in 2018 and updated by Bellman in 2023.[18] The evidence in this summary is obtained from a systematic review of five randomized controlled trials, a quality improvement project using a pre-post design, two literature reviews, an expert opinion article describing a fall prevention intervention, an experimental study conducted at three hospitals, a non-randomized controlled trial that included 37,231 patients, and a systematic review of six pre- and post-test studies. Based on this evidence summary, the following principles should be considered for preventing falls: individuals should participate in the fall risk assessment process; actively engage in decision-making and treatment planning; and receive information about fall prevention and management. In addition, fall prevention and management should be customized; that is, it should consider each individual's condition, specific risks, and intention to engage in behavior that will decrease their risk of falls.

OBJECTIVES

The aim of this evidence implementation project was to improve fall prevention and management among psychiatric patients. The specific objectives were to:

- determine current compliance with best practice recommendations regarding fall prevention and management among psychiatric patients in Tabriz, Iran;
- identify barriers and facilitators to improving compliance and develop strategies to address non-compliant areas;
- evaluate changes in compliance with evidence-based practice recommendations following the implementation of strategies to address identified barriers and enhance the identified facilitators of fall prevention and management among psychiatric patients.

METHODS

This before-after evidence implementation project used the JBI Evidence Implementation Framework,[17] together with the JBI Practical Application of Clinical Evidence System (JBI PACES) audit and feedback tool and the JBI Getting Research into Practice (GRiP) strategy. The JBI Evidence Implementation Framework follows seven phases: (1) identification of practice area for change, (2) engaging change agents, (3) assessment of context and readiness to change, (4) baseline audit, (5), implementation of changes to practice, (6) follow-up audit, and (7) sustainability of changes to practice. These phases occur within three broad stages of activity, namely, implementation planning, baseline audit and implementation, and impact evaluation and sustainability. These are discussed below.

Implementation planning

Phase 1: Identification of practice area for change

After evaluating patient safety indicators in the hospital where the project was conducted, we recognized that patient falls were not at a suitable level and needed improvement. Therefore, an implementation team was established to address this issue.

Phase 2: Engaging change agents

The main stakeholders and relevant participants were identified and a project team was established. The project team consisted of the chief researcher of this project, who was the project leader and responsible for supervising the project team members; one head nurse; and five nurses from the neurology ward.

Phase 3: Assessment of context and readiness to change

The project had the full support of the head of the hospital, hospital management, as well as the main stakeholders. Support was also provided by the treatment deputy of the hospital and the clinical psychologist with regard to data collection. To become familiar with the project setting, a meeting was held with the project team and the health care staff. In the meeting, the objectives, the process of implementation project, and the possible results and outcomes of the project were presented.

Baseline assessment and implementation

Phase 4: Review of practice against evidence-based audit criteria

The baseline audit was conducted between February and March 2020. Eleven evidence-based audit criteria were used for the audit (see Table 1). Criteria 1, 2 and 5 were audited using the MFS, while Criteria 3, 4, and

Table 1: Audit criteria, sample, and method to measure compliance

Audit criterion	Sample	Method used to measure (%) compliance with best practice
1. Fall risk assessment is conducted upon admission.	Baseline audit: 50 patients Follow-up audit: 50 patients	Morse Fall Scale • YES if fall risk assessment was conducted upon admission. • NO if fall risk assessment was not conducted on admission.
2. Fall risk assessment is conducted upon ward transfer.	Baseline audit: 50 patients Follow-up audit: 50 patients	Morse Fall Scale • YES if fall risk assessment was conducted upon ward transfer. • NO if fall risk assessment was not conducted upon ward transfer.
3. Patients participate in the fall risk assessment.	Baseline audit: 50 patients Follow-up audit: 50 patients	Patient interview • YES if patients stated that they participated in the fall risk assessment. • NO if patients stated that they did not participate in the fall risk assessment.
4. Reassessment occurs when there is a change in condition.	Baseline audit: 50 patients Follow-up audit: 50 patients	Patient interview • YES if patients stated that reassessment occurred when there was a change in condition. • NO if patients stated that reassessment did not occur when there was a change in condition.
5. At-risk patients and their families or carers receive oral and written information about fall prevention.	Baseline audit: 50 patients Follow-up audit: 50 patients	Morse Fall Scale • YES if at-risk patients and their families received oral and written information about fall prevention. • NO if at-risk patients and their families did not receive oral and written information about fall prevention.
6. Patients engage in goal-setting and treatment planning	Baseline audit: 50 patients Follow-up audit: 50 patients	Patient interview • YES if patients stated that they engaged in goal-setting and treatment planning. • NO if patients stated that they did not engage in goal-setting and treatment planning.
7. Targeted strategies (including relevant multidisciplinary interventions) are implemented according to individual risk factors.	Baseline audit: 50 patients Follow-up audit: 50 patients	Patient interview • YES if patients stated that targeted strategies (including relevant multidisciplinary interventions) were implemented according to individual risk factors. • NO if patients stated that targeted strategies (including relevant multidisciplinary interventions) were not implemented according to individual risk factors.
8. Post-fall assessment and interventions are implemented (if patient fell).	Baseline audit: 50 patients Follow-up audit: 50 patients	Patient interview • YES if patients who had fallen stated that post-fall assessment and interventions were implemented. • NO if patients who had fallen stated that post-fall assessment and interventions were not implemented.
9. Patient fall risk status is revised and care management plan reviewed (if patient fell).	Baseline audit: 50 patients Follow-up audit: 50 patients	Patient interview • YES if patients who had fallen stated that fall risk status was revised and care management plan reviewed. • NO if patients who had fallen stated that fall risk status was not revised and care management plan reviewed.
10. Patients and their families receive discharge information and referrals for support services (where appropriate).	Baseline audit: 50 patients Follow-up audit: 50 patients	Patient interview • YES if patients stated that they and their families received discharge information and referrals for support services (where appropriate). • NO if patients and their families stated they did not receive discharge information and referrals for support services (where appropriate).
11. Health care professionals receive education on person-centered fall assessment, prevention, and management.	Baseline audit: 20 nurses Follow-up audit: 20 nurses	Health care professional interview • YES if health care professionals stated that they received education on person-centered fall assessment, prevention, and management. • NO if health care professionals stated they did not receive education on person-centered fall assessment, prevention, and management.

6–10 were audited using patient interviews. Criterion 11 was assessed through interviews with the health care professionals. It should be noted that observation would have been preferable as means of auditing; however, the baseline audit took place in the first months of the COVID-19 pandemic and the hospital regulations at that time prevented staff from remaining for a longer period in the wards. Consequently, observation as a means of data collection was ruled out, increasing the possibility of the Hawthorne effect.

The sample for both the baseline and the follow-up audits consisted of 50 patients, 32 of whom were male and 18 were female. Twenty health care professionals also took part, 11 of whom were male and 9 were female. All patients and health care professionals from the neurology ward who participated in the project gave their consent. Those patients and health care professionals who refused to participate were excluded.

Phase 5: Implementation of changes to practice

After conducting the baseline audit and identifying the gaps between current practice and best practice, the project team conducted a GRiP analysis to document barriers, strategies, and resources. The GRiP analysis was conducted in a focus group discussion in April 2020. The chief researcher facilitated the discussion, summarized the opinions of the participants, and entered the data into the GRiP table. This process provided a clearly outlined plan of strategies, which were subsequently implemented.

Impact evaluation and sustainability

Phase 6: Re-assessment of practice using a follow-up audit

After the implementation of intervention strategies developed in the previous phase, a follow-up audit was conducted in January 2021. The same evidence-based criteria were used as in the baseline audit, although the sample was different. The data gathered in the follow-up audit were compared with baseline data to determine any changes in compliance rates.

Phase 7: Consideration of the sustainability of practice changes

The project team determined a schedule for subsequent follow-up audits based on recommendations of the JBI Evidence Implementation Framework,[22] and assigned a team for overseeing the project moving forward.

Analysis

Data on changes in compliance were measured using descriptive statistics embedded in JBI PACES in the form of percentage changes from baseline.

RESULTS

Baseline audit

Figure 1 presents the results of the baseline audit. The baseline audit showed 100% compliance for Criteria 1, 4, 5, 6, 7, 8, and 10. For Criterion 2 (fall risk assessment upon ward transfer) compliance was 87%, while for Criterion 3 (patients participate in the fall risk assessment) compliance was 95%. For Criterion 9 (revision of patient fall risk status) compliance was 50%, while for Criterion 11 (education of health care professionals) compliance was 78%.

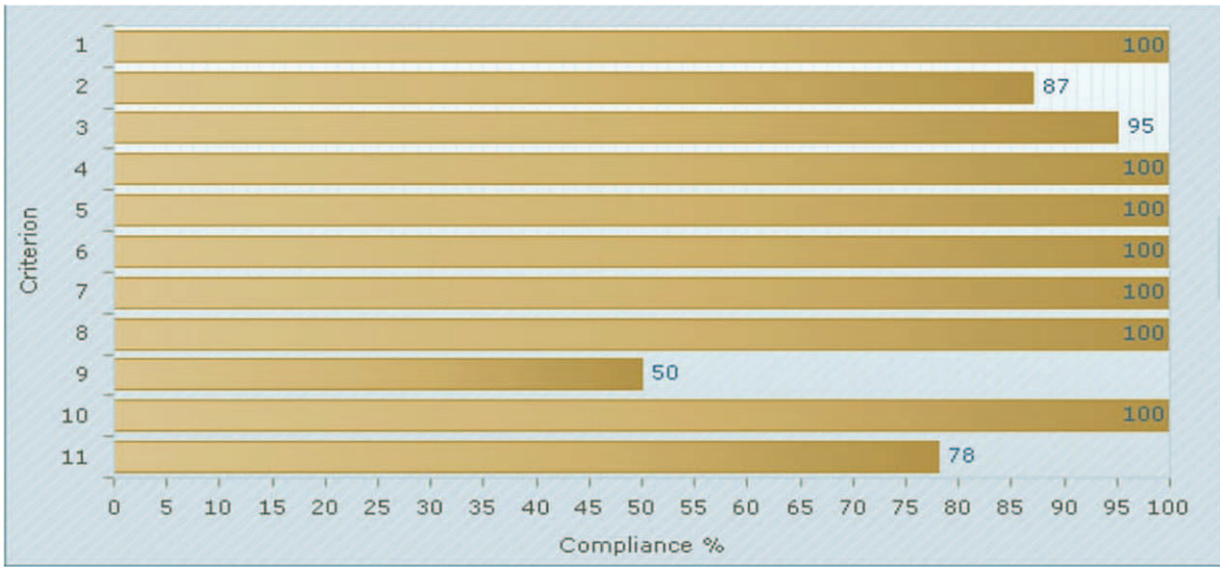
Strategies for Getting Research into Practice (GRiP)

After reviewing the results of the baseline audit, the project team discussed the barriers and strategies for the implementation of the project through two focus group sessions (see Table 2).

Barrier 1: Incomplete fall risk assessment upon ward transfer. To increase compliance with fall risk assessment upon ward transfer, three 45-minute educational sessions were conducted for health care staff. The sessions were delivered by a nurse with expertise in fall risk assessment and patient education, and included educational packages and an introduction to the ward protocol on fall risk assessment. The sessions also highlighted the importance of fall risk assessment upon ward transfer and the need to correctly complete the fall register upon transfer.

Barrier 2: Lack of patient participation in fall risk assessment. To address this barrier, another educational session and two face-to-face meetings were held for all ward staff, emphasizing the importance of patient participation in the fall risk assessment. This was followed a virtual meeting using skyroom to assessed how staff evaluated the education sessions.

Barrier 3: Limited knowledge of the fall prevention protocol. Because of limited staff knowledge of the fall prevention protocol, all ward staff were given additional information about the protocol in a meeting conducted by an expert nurse. The TIDieR (Template for Intervention Description and Replication) checklist was used to describe the interventions.[19]



Audit criteria

1. Fall risk assessment is conducted upon admission. (50 of 50 samples taken)
2. Fall risk assessment is conducted upon ward transfer. (50 of 50 samples taken)
3. Patients participate in fall risk assessment. (50 of 50 samples taken)
4. Re-assessment occurs when there is a change in condition. (50 of 50 samples taken)
5. At-risk patients and their families receive oral and written information about fall prevention. (50 of 50 samples taken)
6. Patients engage in goal-setting and treatment planning. (50 of 50 samples taken)
7. Targeted strategies (including relevant multidisciplinary interventions) are implemented according to individual risk factors. (50 of 50 samples taken)
8. Post-fall assessment and interventions are implemented (if patient fell). (50 out of 50 samples taken)
9. Patient fall risk status is revised and care management plan reviewed (if patient fell). (50 of 50 samples taken)
10. Patients and their families receive discharge information and referrals for support services (where appropriate). (50 out of 50 samples taken)
11. Health care professionals receive education on person-centered fall assessment, prevention and, management. (20 of 20 samples taken)

Figure 1: Compliance with best practices at baseline (%).

Follow-up audit

A follow-up audit was conducted in January 2021. The results for each of the 11 criteria are shown in Figure 2. The comparison shows the changes in compliance between the baseline and follow-up audits. For Criteria 1, 4, 5, 7, 8, and 10, compliance remained at 100%, as per the baseline audit. Compliance increased for Criteria 2 (87% to 90%), 3 (95% to 96%), 9 (50% to 86%), and 11 (78% to 96%). However, for Criterion 6 with reference to patients engaging in goal-setting and treatment planning, there was a drop in compliance (100% to 94%).

Table 2: Getting Research into Practice (GRiP) analysis

Barrier	Strategy	Resources	Outcomes
1. Incomplete fall risk assessment upon ward transfer.	• Educational sessions. • Dissemination and implementation of protocol.	• Educational package. • Face-to-face and virtual meetings.	• Increased compliance for fall risk assessment upon ward transfer (Criterion 2).
2. Lack of patient participation in the fall risk assessment.	• Educational sessions.	• Face-to-face and virtual meetings. • Emails to all ward staff.	• Increased patient participation in fall risk assessment and education about fall risk prevention (Criterion 3).
3. Limited knowledge of the fall prevention protocol.	• Educational sessions. • Dissemination and implementation of protocol.	• Formal meeting. • Printing protocol. • Poster.	• Increased knowledge of protocol (Criteria 9 and 11).

DISCUSSION

In the current implementation project, we aimed to assess compliance with evidence-based audit criteria for fall prevention among patients in the neurology ward of an Iranian psychiatric hospital. In the follow-up audit, compliance increased or remained at 100% for all audit criteria except for Criterion 6 (patient engagement in goal-setting and treatment planning). At first glance, the results of the baseline audit seem very positive, considering the importance of preventing falls among these sensitive psychiatric patients and taking into account the negative psychological effects of falls on the health outcomes of these patients. This is especially so in the socio-cultural and economic conditions of Iran. However, falls should be a "never event," that is, "a patient safety incident that is preventable and so serious that it should never happen."[20] Therefore, follow-up audits need to be continued to ensure that patient falls remain a "never event" at the hospital.

The results of our project are similar to those of another JBI implementation project conducted by Lawrence *et al.*[21] in the United States. That study indicated that 100% compliance was achieved at baseline for all except two criteria. The positive changes recorded in the follow-up audit can be attributed to the change strategies implemented as part of the project. These strategies were all educational interventions that improved the knowledge of health care professionals regarding barriers to fall prevention. Similarly, the results of another JBI evidence implementation project by Lee *et al.*[22] showed that using educational posters about fall prevention increased awareness and reduced patient falls in the acute care setting.

However, in our project, we needed to improve Criterion 6 (Patients engage in goal-setting and treatment planning), where compliance decreased in the follow-up audit. Changes in the hospital environment, workload, and anxiety of staff and patients due to the COVID-19 pandemic peaked at the time of the follow-up audit. This also meant that inadequate time was spent by the health care staff in engaging patients in goal-setting and treatment planning. Consequently, we will conduct further follow-up audits to achieve better results for this criterion.

Similarly, we achieved limited progress for Criteria 2 and 3. For Criterion 2 (Fall risk assessment is conducted upon ward transfer), health care professionals stated that they were busy with COVID-19 tasks and sometimes did not have time to assess fall risk when transferring patients. For Criterion 3 (Patients participate in the fall risk assessment), as with Criterion 6, the limited progress was due to the psychiatric status of the patients, which prevented them from participating in the process.

The experiences gained from this project have shed light on how to address similar audits in the future. The project showed that to improve compliance rates, cooperation is required between specialists from multidisciplinary groups, such as psychiatrists, health care professionals, patients, and their families. To address the various challenges that were encountered, it is necessary to design a careful process for health care professionals' education. Moreover, it is also necessary to thoroughly plan for patient education provided by psychiatry ward nurses, to ensure patient participation in fall risk assessment and treatment planning. Lastly, to maintain positive results, it is necessary to repeat the training on a regular basis. The project team plans to re-audit the clinical criteria after the end of the COVID-19 pandemic to provide a better estimate of the sustainability of fall prevention strategies among psychiatric patients.

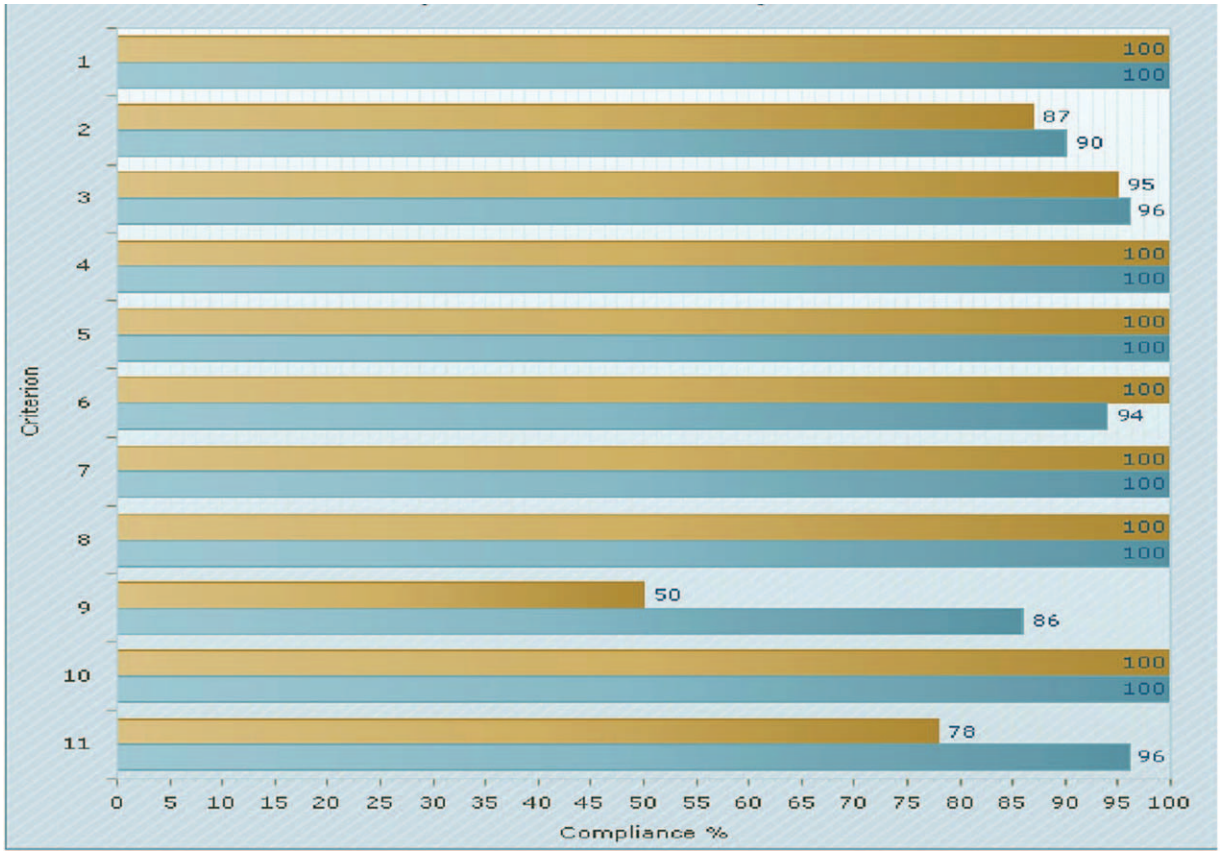


Figure 2: Compliance with best practices showing comparison of baseline and follow-up audits (%).

CONCLUSION

The findings of the current implementation project support the feasibility of conducting audits to implement a fall prevention educational program for health care workers caring for psychiatric patients. Implementing the educational program through meetings and training sessions increased compliance with evidence-based practices. Further audits will need to be conducted to maintain the practice changes and ensure that the project is sustained.

ETHICAL CONSIDERATIONS

Although this project did not require ethical clearance, the research team submitted the code of ethics from Tabriz University's Vice Chancellor for Research (IR.TBZMED.REC.1399.487) after presenting the plan to the Research Council of Tabriz University of Medical Science. Written informed consent was obtained from all participants.

CONSENT FOR PUBLICATION

All authors give consent for publication

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AUTHOR CONTRIBUTIONS

MS was the project leader; MA, FR, and SH monitored and supervised the project; KM collected the data; MS analyzed the data; KO and BA assisted with coordination and GRiP sessions; NK and HS drafted the manuscript.

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