

Utilizing the Hopscotch Game Concept for Fall Prevention Screening in Acute Psychiatric Ward

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INTRODUCTION

Accidental falls rank second among hospitalized patients in Taiwan, with **psychiatric wards exhibiting a higher incidence rate compared to other units**, emphasizing the importance of fall prevention screening. In our acute psychiatric ward, two incidents of patient falls occurred on the day of admission in June 2023, leading to nurse frustration. Analysis revealed the use of computerized high-risk factor screening by nurses, but its simplicity often led to subjective assessments, lacking objective measurements and individualization. Additionally, disputes over footwear safety among psychiatric patients highlighted the need for **improvement in fall assessment tools upon admission.**

AIM

Collaborating with nurses, physical therapists, and occupational therapists, our aim is to improve the current fall risk screening tool by **incorporating the "Hopscotch" game concept**, with the premise of being clinically **easy to implement and effectively identifying high-risk groups.**

METHOD

Our research team created six "**Hopscotch**" **game** levels on the floor near the ward entrance. We utilized two recommended assessment tools, the **Short Physical Performance Battery (SPPB)** and **The Timed Up and Go Test (TUG),** and **visualized** the assessment steps on the floor(Fig. 1).
The first level **involved footwear testing**, where patients confirmed shoe slip resistance on smooth tiles before proceeding through the remaining five levels (Fig. 2&3).

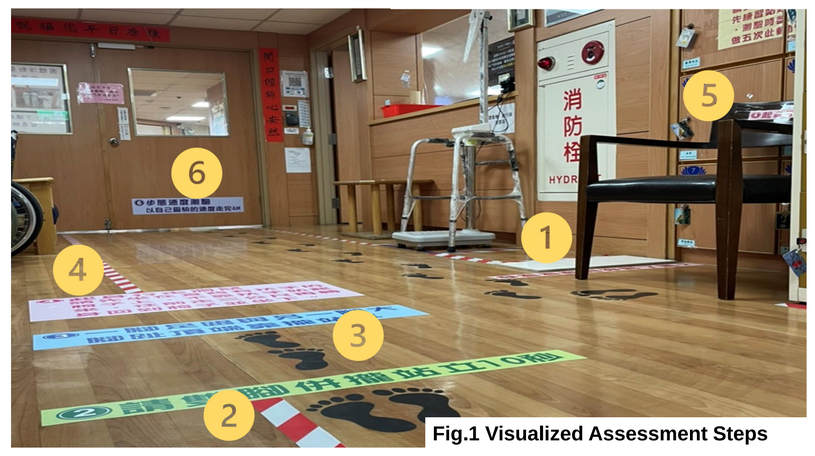
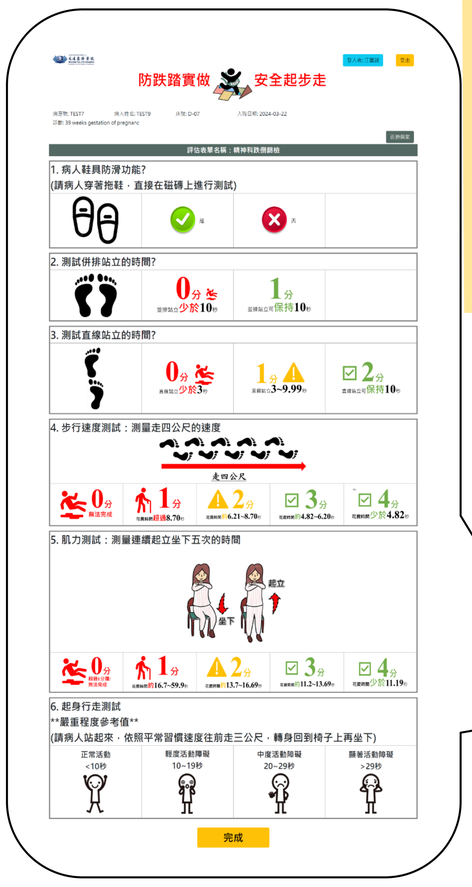


Fig.1 Visualized Assessment Steps



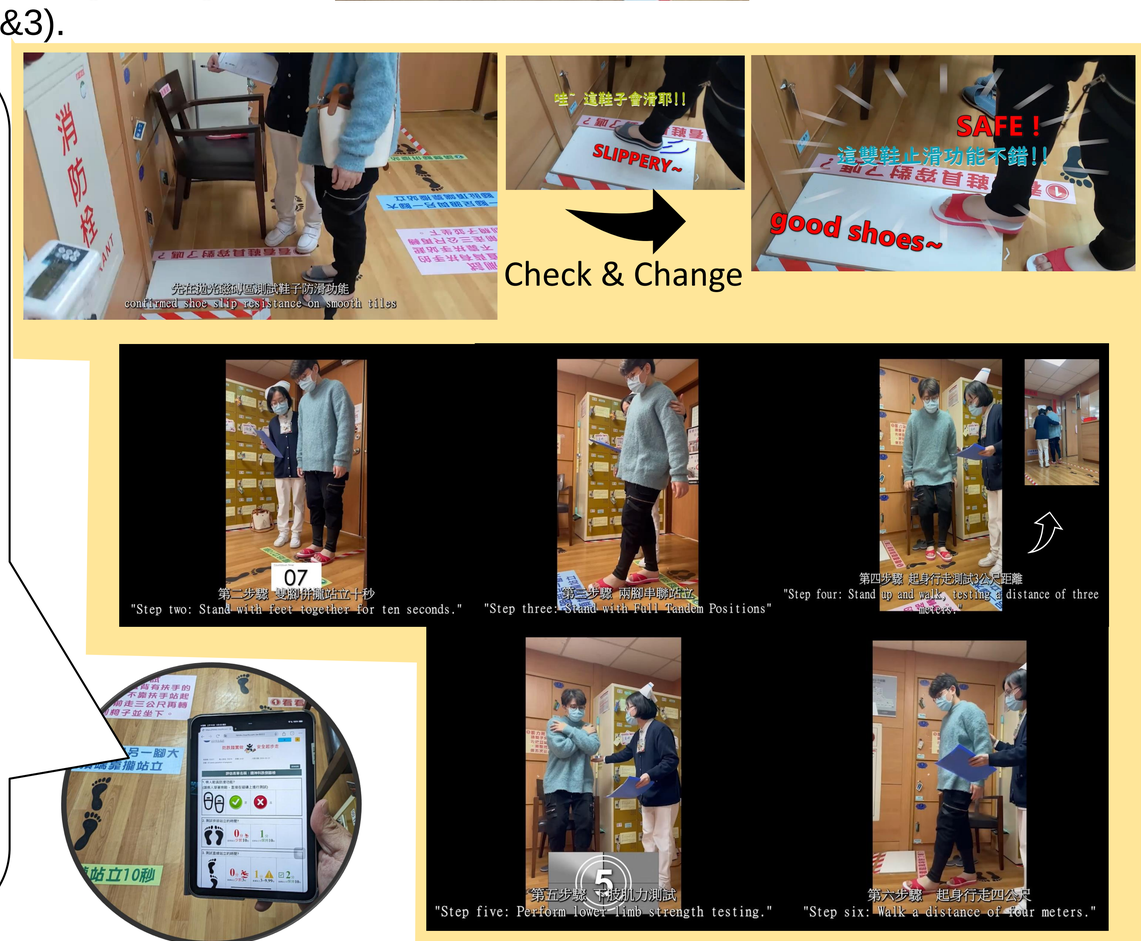


Fig.2 Record the test results using a tablet and upload them

Fig.3 Process of the Hopscotch Game-Based Fall Risk Screening

RESULT



Fig.4 Computerized Fall Assessment

In August 2023, we recruited 14 hospitalized patients and conducted pre-testing using the existing assessment form, followed by post-testing using the "Hopscotch" game-based screening. The computerized fall assessment form took an average of 1 minute and 52 seconds to complete(Fig.4), with **50% (N=7) classified as high-risk,** the results are shown in (Table 1).

Table 1. Confusion Matrix with TP, FP, TN, and FN

	Computerized Positive (High-Risk)	Computerized Negative (Low-Risk)	Row Total
Hopscotch Positive (High-Risk)	True Positives (TP): 1	False Negatives (FN): 7	8
Hopscotch Negative (Low-Risk)	False Positives (FP): 6	True Negatives (TN): 0	6
Column Total	7	7	14

$$FNR = \frac{\text{False Negatives (FN)}}{\text{False Negatives (FN)} + \text{True Positives (TP)}}$$

Substituting the values:

$$FNR = \frac{7}{7+1} = \frac{7}{8} = 0.875$$

The "Hopscotch" game-based screening took an average of 3 minutes to complete, **with 57.1% (N=8) classified as high-risk**. The rate of inadequate footwear was 21.4% (N=3), inability to complete Full Tandem Positions was 28.5% (N=4), and mild or greater impairment in TUG testing was 35.7% (N=5). Notably, **seven cases were reclassified as high-risk only after undergoing the "Hopscotch" game-based screening. The comparison are shown in (Fig. 5)**

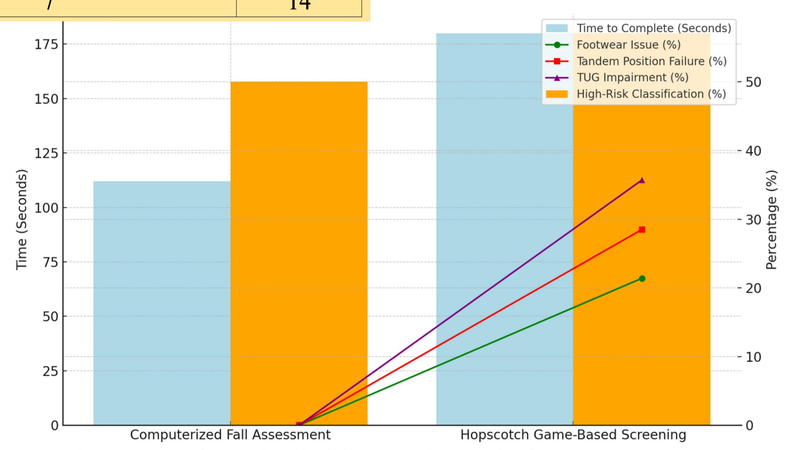


Fig.5 Comparison of Fall Risk Screening Methods

The computerized fall assessment has a high false negative rate(FNR:87.5%), meaning many high-risk cases were not correctly identified. In contrast, the Hopscotch game-based screening performed better at detecting high-risk individuals.

CONCLUSIONS

While the computerized fall assessment form offers convenience, it is susceptible to the **Halo Effect**, **leading to superficial preventive measures.** In contrast, the "Hopscotch" game-based screening requires only **visual guidance, reducing reliance on memory**. **Patients perceive the screening process as either an examination or a game, enhancing screening compliance**. This approach not only identifies inadequate footwear but also detects patients with poor balance, muscle endurance, and positional transition risks, thereby sensitizing nurses to fall prevention strategies.

ACKNOWLEDGEMENT

I would like to thank the hospital leadership for fostering a blame-free patient safety culture that encourages us to face challenges and innovate processes. I also want to express my gratitude to my nursing team for their collaborative efforts in this project, which truly exemplifies the saying, 'If you want to go fast, go alone; if you want to go far, go together.

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