




Use of a perceived efficacy tool to evaluate the FallTIPS program

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Funding information

IBM Watson Health; equity from AESOP; equity from MDClone; equity from Clew; equity from ValeraHealth; CDI Negev; Agency for Healthcare Research Quality, Grant/Award Number: R18HS025128

Abstract

Background/Objectives: To assess nurses' opinions of the efficacy of using the FallTIPS (Tailoring Interventions for Patient Safety) fall prevention program.

Design: Survey research.

Setting: Seven adult acute-care hospitals in 2 hospital centers located in Boston and NYC.

Participants: A total of 298 medical-surgical nurses on 14 randomly selected units.

Intervention: Three-step FallTIPS fall prevention program that had been in use as a clinical program for a minimum of 2 years in each hospital.

Measurements: Fall Prevention Efficiency Scale (FPES), range 13–52; four-factorially derived subscales: valued, efficiency, balances out and inefficiency; and 13 psychometrically validated individual items.

Results: Nurses perceived the FallTIPS fall prevention program to be efficacious. The FPES mean score of 38.55 (SD = 5.05) and median of 39 were well above the lowest possible score of 13 and scale midpoint of 32.5. Most nurses ($N = 270$, 90.6%) scored above 33. There were no differences in FPES scores between nurses who had only used FallTIPS and nurses who had previously used a different fall prevention program.

Conclusion: The nurses who used FallTIPS perceived that efficiencies in patient care compensated for the time spent on FallTIPS. Nurses valued the program and findings confirmed the importance of patient and family engagement with staff in the fall prevention process. Regardless of the fall prevention program used, organizations should examine staff perceptions of their fall prevention program because programs that are not perceived as being useful, efficient, and valuable will lead to nonadherence over time and then will not reduce falls and injuries. The recently developed FPES used in this study is a

brief tool available for organizations to assess nurses' perceptions of the efficacy of their fall prevention program. Additional FPES research is needed with larger and more diverse samples.

KEYWORDS

fall prevention, FallTIPS, nurses

INTRODUCTION

Falls in hospitals represent a longstanding,¹ persistent, and sometimes lethal problem² with a fall rate of 3.7 per 1000 bed-days³ and a million patients who fall annually in hospitals.⁴ Our team developed a fall prevention program, FallTIPS (Tailoring Interventions for Patient Safety), that is a three-step process carried out with the patient and family: (1) Identification of fall risks using the 6-item Morse Fall Scale (MFS),⁵ (2) development of a plan linking specific risks with evidence informed interventions, and (3) communication by making the plan visible and readily available to patients, families and all staff. Three modalities are available to communicate the plan: (1) original FallTIPS using health information Technology (HIT) and the electronic health record (EHR) to print a custom handout for each patient⁶⁻⁸ with icons to communicate fall risks and interventions,⁹⁻¹¹ (2) a "low tech" laminated paper/poster version, and (3) bedside screensaver.¹² The methodology and results of the FallTIPS program have been reported elsewhere.¹³⁻²⁰ Briefly, we have reported that Fall TIPS is associated with reduced falls in patients in acute care hospitals by 25%⁶ and injurious falls by 34%.²¹

All too frequently, interventions that have been successful in research projects are not successful in clinical practice. It is common for clinicians to be willing to carry out an intervention during the study but find the intervention too burdensome and time consuming to integrate it into their permanent workflow. We had shown that FallTIPS was an effective intervention for reducing both falls⁶ and injurious falls,²¹ but did not know if nurses using it in their clinical practice found it burdensome or time consuming. The aim of this research was to assess nurses' perceived efficacy of the FallTIPS fall prevention program.

METHODS

Sites

We conducted this study at four Academic Medical Centers and three Community Teaching Hospitals in two Hospital Centers (HCs) located in Boston and NYC. FallTIPS had been implemented on all adult in-patient units between 2012

Key Points

- Nurses reported that efficiencies in patient care compensated for the time spent on the FallTIPS program.
- Nurses confirmed the importance of patient and family engagement with staff in the fall prevention process.

Why Does this Paper Matter?

This work provides a model of how organizations can use the FPES to measure staff perceptions of their fall prevention program. This is important because programs that are not perceived as useful, efficient and valuable will lead to non-adherence over time and then will not reduce falls or fall related injuries.

and 2017 as a change in clinical practice. These were ideal settings because FallTIPS had been a part of nursing workflow for a minimum of 2 years, thus eliminating a potentially confounding effect on perceived efficacy from the introduction of a new program. Two adult in-patient units from each hospital ($N = 7$) were randomly identified to participate. The 14 units were mostly surgical (Table 1).

Participants

All registered nurses assigned to provide direct patient care on the 14 study units were eligible to participate. Unit based nurses in leadership or teaching positions, nursing or patient care assistants and other interdisciplinary clinicians were not eligible. A total of 566 individual nurses ($N = 350$ Boston and $N = 216$ NY) were invited to participate.

Recruitment

Since we planned not to survey every HC nurse, but to obtain a random sample to represent HC nurses, achieving

a high response rate was important. To maximize the response rate to assure representativeness of a small population,²² we followed Dillman’s²³ recommendations of sending several requests for participation, and planned for 3-weeks of data collection. Using the email list of 100% of nurses assigned to the 14 units, the invitation to participate with the Research Electronic Data CAPture (REDCap)²⁴ link to the anonymous survey was sent to each nurse by either their unit FallTIPS champion or manager. On weeks 2 and 3, the RedCAP link was re-sent with the invitation modified to include the wording, “We thank you if you have already responded, you do not need to respond again.”

Outcome measure: Fall Prevention Efficiency Scale

We used the 13-item Fall Prevention Efficiency Scale (FPES).²⁵ Items are rated using a 4-point Likert

scale: 1 (strongly disagree), 2 (disagree), 3 (agree), and 4 (strongly agree). Negatively worded items are reverse scored; higher scores indicate higher perceived efficacy. The range is 13 to 52 with a midpoint of 32.5. The FPES, its four factorially derived subscales (see Figure 1): (1) valued, (2) efficiency, (3) balances out, and (4) inefficiency and 13 individual items had demonstrated robust internal consistency and stability.²⁵ We examined FPES’ frequency distributions, internal consistency, and relationships with other variables. Nurses who had used another fall prevention program before using FallTIPS were asked to estimate the minutes per day/per patient that they spent on fall prevention activities before using FallTIPS. We also asked them to estimate the minutes per day/per patient that they spent using FallTIPS. Minutes post FallTIPS were subtracted from minutes pre FallTIPS to compute “minutes saved,” which served to make the categorical variable “time saved,” yes or no.

TABLE 1 Nurse respondent characteristics^a

Demographic descriptions, employment site, and FallTIPS experiences		Total (N = 298)	Used only FallTIPS (N = 115)	Had used other FPP (N = 166)
Variable—mean (standard deviation)				
Age		39.5 (11.9)	37.9 (13.1)	40.6 (11.1)
Years RN experience		14 (12)	12.6 (12.6)	14.8 (11.4)
Variable—number reporting (%)				
Female gender		270 (93%)	106 (95%)	50 (9%)
Non-Hispanic ethnic group		249 (94%)	94 (90%)	141 (97%)
Race	Native American or Hawaiian	6 (2%)	5 (5%)	1 (1%)
	Asian	32 (13%)	12 (12%)	17 (12%)
	Black	40 (16%)	11 (11%)	25 (18%)
	White	173 (69%)	71 (72%)	94 (69%)
Highest education	Diploma or Associate Degree	32 (11%)	13 (11%)	16 (10%)
	Baccalaureate Degree	225 (78%)	88 (78%)	125 (79%)
	Master’s or Doctoral Degree	31 (11%)	12 (11%)	18 (11%)
Hospital site	NYC	78 (26%)	27 (24%)	45 (27%)
	Boston	217 (74%)	87 (76%)	120 (73%)
Type unit	Neurology/other	46 (15%)	14 (12%)	29 (17%)
	Medical/oncology	83 (28%)	33 (29%)	44 (27%)
	Surgical/orthopedics	168 (57%)	68 (59%)	93 (56%)
Duration using FallTIPS	Under 1 year	52 (18%)	21 (19%)	27 (17%)
	Between 1 and 3 years	140 (49%)	57 (51%)	74 (47%)
	Over 3 years	92 (32%)	33 (30%)	56 (36%)
FallTIPS modality used	Laminated/screen or screen saver	27 (9%)	13 (10%)	13 (7%)
	EHR printout	62 (21%)	20 (17%)	38 (23%)
	Laminated poster	207 (70%)	82 (71%)	116 (70%)
Time saved	Yes			45 (38%)
	No (time wasted or no difference)			72 (62%)

^aSubjects did not respond to all items; 17 subjects did not declare their FallTIPS experience.

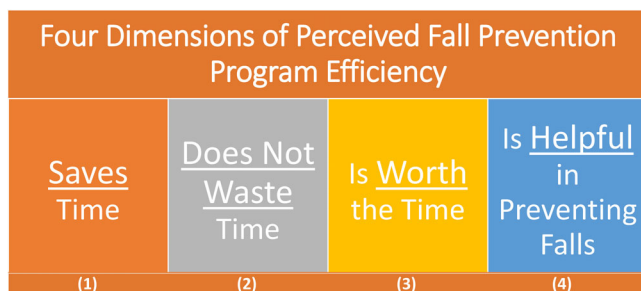


FIGURE 1 The four dimensions of perceived fall prevention program efficiency

Analytic plan

We followed Dillman's suggestions to assure an adequate sample size²³ and used REDCap²⁴ to electronically transmit and acquire requested data. Data were analyzed using SPSS.²⁶ Institutional review boards of the participating hospitals approved the study, invitations to participate, and recruitment mechanism. Completion of the anonymous survey was considered indicative of informed consent. Demographic data from individual units were examined to identify potential subjects who may have responded more than once. There were none.

RESULTS

Subjects

A total of 298 nurses completed the FPES (Table 1), a 52.7% participation rate. Using median scores or highest frequency, the typical respondent was a 38-year-old white female with a baccalaureate degree who had 10 years of RN experience. Subjects differed from nurses in the 2020 National Nursing Workforce study²⁷ whose mean age was 52 years and who had 20 years nursing experience. The national sample²⁷ had more males (9.4% vs. 7%) and Caucasians (81% vs. 69%) but fewer nurses with a B.S. degree of higher (65.2% vs. 89%). More study respondents were from a Boston than from an NYC hospital and worked on a surgical or orthopedic unit at an academic medical center. Fewer respondents had only used FallTIPS than those who had used another fall prevention program before using FallTIPS. The laminated poster was the most frequently used FallTIPS modality for supporting nurse/patient communication about the fall prevention plan.

Outcome measure-FPES

The FPES was normally distributed, allowing for the use of parametric statistics (Table 2). Scores ranged from

19 to 52 (FPES range = 13–52). Item-total correlations for all 13 items were below 0.7, indicating lack of redundancy. Internal consistency was excellent for the FPES ($\alpha = 0.83$) and adequate for the four subscales (average $\alpha = 0.73$) (Table S1). FPES validity was confirmed by the time saved variable. FPES scores of the 45 subjects who spent fewer minutes per patient using FallTIPS than when using their previous fall prevention program were higher (mean 39.4, SD = 3.17) than those of the 72 subjects who did not save time by using FallTIPS (mean 37.81, SD = 5.19) (Table S2).

Primary outcome: FallTIPS – Efficacy

FPES scores showed that nurses perceived that FallTIPS was an efficacious fall prevention program. The FTES overall mean score was 38.55 (SD = 5.05, median = 39), well above the midpoint of 32.5 and the lowest possible score of 13. Only 28 of 298 nurses scored below the midpoint. Nurses valued FallTIPS, scoring 18 on the 6-item valued subscale (range = 6–24). The efficacy perceptions of nurses who had only used FallTIPS and those who had previously used another fall prevention program were similar. Only one item, “No extra work is required since components of our fall prevention program are integrated within our work flow” had statistically different means in which the “only FallTIPS group” scored higher (2.81 vs. 2.60), but the 0.21 difference was not considered consequential on a scale of 1–4.

Knowing a patient's ambulation and toileting status, if a bed alarm was needed, and that the posted plan in was current contributed to positive efficacy perceptions as did availability of adequate resources. The final item distinguishes FallTIPS from other fall prevention programs that merely state degree of patient risk because it provides explicit fall prevention interventions to address specific risks. We explored the potential impact of demographics and FallTIPS experiences on FPES scores and except for the time saved variable discussed below, there were no differences associated with ages, years of nursing experience and tenure on current unit, educational preparation, type of unit, location, FallTIPS modality used, or time using FallTIPS (Table S2). These results confirmed that FPES scores were not influenced by other variables.

Time saved

Of the 166 nurses who had used another fall prevention program prior to FallTIPS, 117 responded to the time questions. The 72 nurses who spent more time on fall prevention after using FallTIPS spent almost a minute

TABLE 2 FPES individual items' responses^a

Fall prevention efficiency scale item total sample (N = 298)	Mean (SD)
Our fall prevention program conserves our time because:	
1. No extra work is required since components of our fall prevention program are integrated within our workflow**	2.69 (0.78)
2. The resources we need to carry out the program are readily available	2.99 (0.65)
3. We know if a patient needs to have a bed alarm activated or not	3.16 (0.59)
4. We know a patient's ambulation status	3.13 (0.62)
Our fall prevention program wastes our time because:	
5. Of not being sure the plan in the patient's room is current	2.61 (0.85)
6. Of the steps needed to update the plan in the patient's room	2.67 (0.83)
FallTIPS is worth the time it takes because we:	
7. Do not have to check toileting procedures, since patients' fall prevention plans are visible in their rooms	2.61 (0.78)
8. Found FallTIPS easy to use once learned	2.98 (0.63)
My opinion about FallTIPS is that:	
9. Involving the patient and asking questions while conducting the fall risk assessment is helpful	3.10 (0.57)
10. Observing patients' capacity to ambulate during the fall risk assessment is helpful	3.16 (0.51)
11. Planning fall prevention interventions with the patient is helpful	3.17 (0.53)
12. Involving the family with the patient's fall prevention plan is helpful	3.14 (0.62)
13. Having patient specific fall prevention interventions versus knowing "low, medium, high fall risk" is helpful	3.04 (0.72)
Fall prevention efficiency scale total	38.46 (5.1)

^aSubjects did not respond to all items.

**Only item with statistically different means between participants who only used FallTIPS (2.81, SD = 0.66) and participants who had used another fall prevention program (2.60, SD = 0.85) before using FallTIPS (F = 5.09, p = 0.025).

more per patient. The 45 nurses who spent less time after converting to FallTIPS saved 10.7 minutes per patient. Nurses who reported saving time by using FallTIPS had higher FPES scores. Differences between 37.8 (time not

saved) and 39.4 (time saved) were statistically significant although clinical significance is unclear.

Secondary outcomes: Procedures and engagement

The highly positive scores nurses gave to items critical to planning with patients and family and communicating the plan to all key stakeholders confirmed the value of these important steps and that time spent carrying them out was not wasted. Endorsement of FallTIPS efficiency (and essential to its adoption by busy bedside nurses) was provided by nurses' reporting that FallTIPS did not require extra work because its components were integrated within their workflow and once learned, were easy to use. Patient engagement,¹⁹ central to FallTIPS, was verified by the overwhelmingly positive responses to involving the patient by asking questions/observing patients during the fall risk assessment and planning interventions with the patient. Nurses also valued family engagement, believing that involving the family with the patient's fall prevention plan is helpful.

DISCUSSION

Nurses perceived that FallTIPS was an efficacious program, scoring above the midpoint on all items. Scores confirmed that nurses valued FallTIPS and that efficiency balanced out any inefficiencies. This is important because unless bedside nurses are satisfied with clinical programs, they will not be accepted and used.²⁸

Even the 72 nurses who reported not saving time on fall prevention after converting to FallTIPS scored five points over the FPES midpoint. Except for the "time saved" variable (FPES = 37.8 for "time not saved" participants versus 39.4 for "time saved" participants), analysis of variance examination of FPES scores with other FallTIPS experiences and demographic characteristics found no relationships, confirming that FPES scores reflected efficacy perceptions versus being influenced by other variables.

Secondary outcomes validated the importance of patient engagement – leading to activation in carrying out one's fall prevention plan. Although the Klancnik team's systematic review found "insufficient rigorous evidence to support the use of person-centered interventions in reducing patient falls (p. E20),"²⁹ FallTIPS, carried out in collaboration with the patient and family, promotes patient/family/staff communication. The hallmark of FallTIPS is the integration of patient centered interventions specifically tailored for individual patients, which

others have found to be key in reducing falls.³⁰ Communication facilitated by either the printout generated from the EHR or laminated poster filled in by nurse was considered important. The laminated poster, a low-tech and inexpensive FallTIPS modality, can be effectively used by hospitals with limited EHR capacity.

Strengths and limitations

The study sites were a major strength because they had used FallTIPS for over 2 years prior to this study, avoiding the potential influence of implementation glitches on FPES scores. The 53% response rate affirmed utilizing the personalized repeated approach to requesting participation with a respected leader sending the email.²³ The sample size (298) and number of hospitals (7) were small and 57% nurses worked on surgical units. We recognize these limitations and that results may not be representative of all hospitals and non-surgical units. Additional FPES research is needed with larger and more diverse samples.

Conclusion

Fall prevention programs should be examined for patient outcomes of falls and fall related injuries as well as for the degree to which program elements are executed. The emerging field of implementation science, distinct from the rigorous approach of clinical research, includes recognizing and attending to barriers and enhancing facilitators to implement evidence-informed clinical programs. Thus, users' concerns can be identified and addressed to correct program elements that waste time and are not likely to be carried out consistently and to enhance program elements perceived as valuable.

CONFLICT OF INTEREST

This manuscript was supported by a grant from the Agency for Healthcare Research Quality R18HS025128 (Dykes PI). DWB received personal fees from CDI Negev, equity from ValeraHealth, equity from Clew, equity from MDClone, personal fees and equity from AESOP, and grants from IBM Watson Health (all outside the submitted work). For the remaining authors, none declared.

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Study concept and design: Patricia C. Dykes, Ann C. Hurley, Jason Adelman, and David W. Bates. *Acquisition of subjects and/or data, analysis and interpretation of data:* Patricia C. Dykes, Ann C. Hurley, and Diane L. Carroll. *Preparation of manuscript:* Patricia C. Dykes, Ann C. Hurley, Diane L. Carroll, David W. Bates,


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SPONSOR'S ROLE

The sponsor, AHRQ, had no role in the design, methods, subject recruitment, data collections, analysis and preparation of article.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

Table S1. Fall Prevention Efficiency Scale Psychometric Properties: Frequencies and internal consistency.

Table S2. Analysis of variance (ANOVA) table displaying the potential influence of subjects' variables on FPES total scores.

How to cite this article: Dykes PC, Khasnabish S, Adkison LE, et al. Use of a perceived efficacy tool to evaluate the FallTIPS program. *J Am Geriatr Soc.* 2021;69(12):3595-3601. doi:10.1111/jgs.17436