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The Safety Showdown

Perceptions and Practice Change of Inpatient Caregivers After a Patient Safety Escape Room

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Educational escape rooms actively engage learners and foster teamwork. It is unclear if they result in nursing practice change. Three hundred ninety-eight nursing and ancillary caregivers participated in an escape room involving patient safety and fall prevention concepts. An average rating of 4.3 out of 5 on the escape room perception scale was obtained via a postsurvey, showing positive perceptions of the event. In a delayed postsurvey, participants discussed resultant patient safety practice changes.

Inpatient falls are common hospital-acquired injuries. According to the Agency for Healthcare Research and Quality (2020), approximately 700,000 to 1,000,000 patient falls occur in hospitals each year. Approximately 2,000 of these falls resulted in mild to severe harm, and nearly 160 resulted in death. Because of their preventable nature, the Centers for Medicare & Medicaid Services (2020) provide little to no reimbursement for falls that occur in the hospital setting, especially those with injury. The Joint Commission Center for Transforming Healthcare (2021) estimates the average cost for a fall with injury at \$14,056 and adds 6.3 days in the hospital, on average. Preventing falls in the hospital requires caregiver competency in assessing patients' fall risk and other risks for harm. Caregivers must also implement interventions tailored to each patient's unique needs.

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LITERATURE REVIEW

Education for the adult learner in the healthcare setting is typically delivered in a passive fashion via lectures or computer-based training. Education modalities are evolving and increasing innovative strategies to deliver educational content. Escape rooms, a type of serious game, actively engage learners in educational content (Adams et al., 2018). Escape rooms are “live-action team-based games where players discover clues, solve puzzles and accomplish tasks in one or more rooms in order to accomplish a specific goal (usually escaping from the room) in a limited amount of time” (Nicholson, 2015, p. 1). Escape rooms foster collaboration and content retention and are well received by adult learners (Morrell & Eukel, 2020a). Rincón and Meija (2019) declare that, “The philosophy of the escape room as a lived experience is not only attractive to the student but effective in terms of learning and a powerful element within the arsenal of teaching strategies” (p. 480).

Adams et al. (2018) implemented an escape room for nurses related to nurse residency content. Participants positively received the event and found that it was a way to demonstrate content knowledge, though the study did not discuss resultant practice change. Nybo et al. (2020) found that nursing residency students who completed an escape room related to residency concepts felt empowered to improve their nursing practice. Although feedback from this study was positive, there was little exploration of the nurses' perception of the technique for learning. In an escape room centered on safety and quality in the hospital setting, researchers found that 60% of nurse participants indicated that the experience would lead to practice changes, though follow-up on actual practice change was not reported (San Martin et al., 2021). Participants in a perioperative nurse residency escape room agreed that the event increased skills and facilitated teamwork and collaboration, but practice change was not evaluated (Kinlaw, 2020). Numerous studies have demonstrated that educational escape rooms increase student knowledge, enhance the active application of teamwork and team communication, and are positively received by students; they also have been shown to effectively develop students' knowledge, skills and teamwork (Cain, 2019; Clarke et al., 2017; Eukel et al., 2017; Friedrich et al., 2018; Kinio et al., 2019; Morrell & Ball, 2020; Morrell & Eukel, 2020a, 2020b). However, there

is little research on the impact of educational escape rooms with practicing healthcare professionals in the hospital setting as a professional development innovation (Adams et al., 2018).

The purpose of this study was to evaluate the perceptions of nurse and patient care technicians of the escape room gaming technique for professional development in the hospital setting. This article details the tasks of “The Safety Showdown” escape room experience for nurses and patient care technicians and their perceptions of the offering immediately after the event. In addition, reflections 1–2 months after the event are reported, including practice changes. The effect on patient falls before and after the escape room offering are described in another upcoming manuscript.

METHODS

Nurse educators, clinical nurse specialists, and physical therapists developed and implemented The Safety Showdown escape room experience for acute inpatient caregivers, that is, nurses and patient care technicians, in a midsize Midwest hospital to reinforce general patient safety measures, most notably, patient falls. The hospital’s institutional review board determined this study was exempt from review and approved the study. To fulfill the International Nursing Association for Clinical Simulation and Learning (INACSL Standards Committee, 2016b) and Association for Nursing Professional Development (2016) standards of meeting identified objectives to achieve outcomes and including content experts, a multidisciplinary planning committee of key stakeholders, including nurse educators, clinical nurse specialists, and physical therapists, developed primary learning objectives, puzzles, and the escape room storyline. Patient character development, props, and riddles were created. The Safety Showdown had three main objectives: Participants will (a) implement patient fall prevention interventions, (b) perform a patient transfer using correct body mechanics, and (c) collaborate with team members.

The escape rooms occurred in classrooms arranged like patient hospital rooms. Each room contained a facilitator dressed as a patient. Facilitators were nursing professional development (NPD) specialists, unit-based nurse educators, or the hospital’s clinical nurse specialist. These patient facilitators logged team times, assisted teams with transitions during the gaming experience, and facilitated team debriefing. A facilitator binder guide, disguised as a magazine, contained patient details, acting cues, two reward tokens, and four penalty tokens. The tokens contributed to the final time.

Teams of up to six caregivers were composed of nurses (PCC, RN, and LPN) and patient care technicians. To accommodate staff volume, the escape room was offered several times on 9 days over the span of 5 weeks, 75 times in total. To begin the escape room, brief instructions were provided before teams opened the classroom door, signaling the patient facilitator to start a 35-minute countdown

timer. Teams started with a bedside shift report recorded on a laptop and a clue for their first task. Positioned next to the laptop was a resource envelope containing patient information and electronic medical record notes; a labeled black light, and three clue tokens that could be used to ask questions of the “charge nurse” if they got stuck.

The first task required teams to calculate the patient’s Hester Davis Fall Risk score (HD Nursing, 2020). This numeric code opened a lockbox, which contained three colored envelopes, corresponding to fall risk categories. Teams had to select the correct envelope for the patient’s fall risk category; a puzzle piece and the next task were included in the envelope. The second task began with the completion of a fill-in-the-blank puzzle. Teams were asked to identify interventions and care plans for corresponding fall categories. Once completed, each category revealed a boxed letter that, together, spelled out the word “T-R-A-N-S-F-E-R.” For the first time, the patient facilitator spoke to the group, indicating the need to use the restroom. The goal was for the participants to safely transfer the patient to the bedside commode using proper safety techniques. Once completed, the patient handed the teams a puzzle piece and a hint for their next task. If participants did not implement all the safety interventions upon transfer, a 2-minute penalty token was given. A 2-minute reward token was granted if teams expressed curiosity regarding the patient facilitator’s indwelling urinary catheter.

The supplies for Task 3 were located several steps away from the patient facilitator. During their daily work with patients, caregivers are expected to stay with fall risk patients while toileting. If the entire team left the patient facilitator unattended, a penalty was incurred. Task 3 included a crossword puzzle with questions related to infection prevention and catheter-associated urinary tract infection prevention. Necessary supplies to perform urinary catheter care were laid out on a table, with four pieces of the crossword puzzle mixed in with them. Teams taped the puzzle together and solved it. The crossword instructed the team to use the black light pen to illuminate letters from the crossword puzzle. These spelled out “back to the chair” when unscrambled, directing the team to return the patient facilitator back to the chair.

The final task called for teams to get the patient facilitator back to the chair from the bedside commode. At this point, the patient facilitator had been sitting for quite some time, rendering them too weak to transfer with just two caregivers. The goal was to get the teams to either use a three-person transfer or verbalize the need for lift equipment. Teams who verbalized the need for lift equipment received a 2-minute reward; teams who insisted on the use of a two-person transfer, which did not provide the patient with the level of assistance needed, incurred a 2-minute penalty. Once safely back to the chair, the patient facilitator provided teams with the final puzzle piece. The completed

four-piece puzzle read, “Congratulations, you kept your patient safe. Now, you may escape!”

After teams successfully escaped or at the end of 35 minutes, the patient facilitator led a 15- to 25-minute debriefing session. According to International Nursing Association for Clinical Simulation and Learning, “Integration of the debriefing process into simulation-based experiences enhances learning and heightens participant self-awareness and self-efficacy” (INACSL Standards Committee, 2016a, p. S21). Teams reflected on what went well during the experience, their team interactions, and what they would do differently if given the opportunity to complete the experience again. Facilitators addressed any actions with potential for serious patient harm but otherwise allowed participants to come to their own conclusions.

Survey Design and Distribution

Convenience sampling was used for this study with all caregivers who participated in The Safety Showdown experience being invited to participate immediately after the debriefing. Participation in the survey indicated consent. The survey included five demographic items (see Table 1). Participants were also asked if they had (a) attended the hospital’s Safety Fair, an educational offering that provided information about

various hospital safety initiatives 3 years prior, (b) previously completed the Hester Davis training, and (c) had cared for a patient who had fallen while under their care. The survey included 14 questions related to perceptions on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). Perception items originally created by Eukel et al. (2017) were adapted to relate to the escape room topic and audience. The internal reliability of the gaming perception construct for this study, as measured with Cronbach’s alpha, was very strong at .96, which is significantly higher than .70, the accepted value for strong internal reliability (Tavakol & Dennick, 2011). The overall gaming perception score for each participant was computed as the mean of their answers to the 14 items in the gaming perception construct. Participants also answered two questions about their level of perceived change in practice following participation in The Safety Showdown.

All participants were invited to complete a delayed postsurvey 1–2 months after the educational event to gather information on the impact of The Safety Showdown escape room on their knowledge retention and workplace collaboration. This included open-ended items to gain a fuller understanding of participants’ perceived value and impact of the escape room after the experience. The questions were as follows: (a) What did you like best about The Safety Showdown escape room experience? (b) How did The Safety Showdown escape room experience compare to other learning activities you’ve completed in the past? (c) What has changed in your daily practice since The Safety Showdown escape room experience?

RESULTS

Table 1 summarizes the demographic data collected from the participants in this study.

A total of 398 nurses and patient care technicians from six different acute care units participated in the educational escape room. Of the 398, 384 (96%) partially or fully completed the postexperience survey immediately following the escape room. On the perception scale, the mean score of the overall perception measurement was analyzed because this tool was designed to measure the entire construct of perceived educational value of an educational escape room (Eukel et al., 2017). The average overall gaming perception score was 4.3 ($SD = 0.64$) out of 5, showing a highly favorable perceived impact of the gaming activity on their own learning. The results of each perception survey question are shown in Table 2.

Gaming perception mean score was analyzed to determine if demographics influenced participants’ perceptions of the educational escape room. A one-way analysis of variance indicated that only one of the demographic categories, time in the current role, had a statistically significant effect on participant perceptions (see Table 2). A post hoc analysis indicated that participants with less than 1 year in the current role had a mean perception score (4.50) that was statistically significantly higher than the mean perception score (4.06) of the participant with 20 years or more in the current role. This difference is in line with our prediction that

Age (n = 384)		Role (n = 383)		Years in Current Role (n = 384)	
<21 years	17	PCC	37	<1 year	65
22–37 years	236	RN	233	1–3 years	125
38–53 years	94	LPN	5	4–7 years	73
>53 years	37	PCT	108	7–12 years	60
				>12 years	61
Employment Description (n = 382)			Description of Typical Shift (n = 382)		
32–40 hours/week		247	Day shift		226
24–31 hours/week		101	Night shift		154
Less than 24 hours/week		8	Other		2
PRN only		26			
Attended Safety Fair in 2016 (n = 381)		Completed Hester Davis Training (n = 374)		History of Patient Fall While Working (n = 381)	
Yes	154	Yes	198	Yes	209
No	227	No	176	No	172

TABLE 2 The Safety Showdown Perception Survey Items and Results (*n* = 369)

Item	Mean	SD
The Safety Showdown encouraged me to think about the material in a new way.	4.16	0.800
I tried to apply prior knowledge about falls prevention and patient safety during The Safety Showdown.	4.57	0.693
The Safety Showdown was an effective way to review falls prevention and patient safety.	4.46	0.740
I feel I was able to engage with my coworkers to learn new material.	4.36	0.771
The Safety Showdown was an effective way to assist my learning of falls prevention and patient safety.	4.37	0.741
I was able to catch new ideas about falls prevention introduced into the game.	4.09	0.899
The game motivated me to integrate falls prevention and safety knowledge that I have previously learned.	4.39	0.722
The Safety Showdown was an effective way to learn new information related to falls.	4.30	0.765
I am encouraged by the improvements of my fall prevention and patient safety skills after this game.	4.25	0.738
I learned from my peers during The Safety Showdown.	4.30	0.739
Puzzles and ciphers used in the game helped me learn about falls prevention and patient safety.	4.20	0.814
I was given enough information to complete the puzzles and ciphers.	4.16	0.879
My fall prevention and patient safety skills gradually improved as I overcome game challenges.	4.13	0.804
I would recommend this activity to other caregivers.	4.43	0.738

younger participants would more positively favor educational gaming. Although the analysis of all other demographic variables did not indicate any statistically significant differences, the trends in the mean gaming perception scores were the same, with participants with fewer years in their current role having higher mean scores than the more experienced ones.

When comparing participants who had or had not participated in the 2016 Safety Fair, nonsignificant differences were noted in composite perception results ($p = .791$). Participants who had taken Hester Davis training in the past had a slightly higher mean composite perception score (4.33) compared to those who had not (4.26), but this finding was nonsignificant ($p = .37$). Participants who had a patient fall while they were caring for them had a slightly lower mean composite perception (4.25) compared to those who had not (4.37), but this was also not significant ($p = .145$). This result suggests that effectiveness of the gaming activity was perceived as being a positive learning activity independent of previous levels of expertise on the subject matter.

To summarize, the findings from our analysis showed that The Safety Showdown is a positively perceived educational intervention for fall prevention. In addition, demographics, history of previous training episodes, and work history did not statistically affect participants' perceptions. Also, The Safety Showdown shows positive self-perceived impact for all participants, independent of previous falls and safety education or personal experience with a patient who has fallen.

Participants also answered two questions about their level of perceived change in practice following participation in The Safety Showdown. For the question, "On a scale of 0–100 (0 = *no desire*, 100 = *strong desire*), what level of change will what you've learned have on your daily practice," the average perceived level of change was 77 ($n = 358$). For the question, "On a scale of 0–100 (0 = *no desire*, 100 = *strong desire*), what level of change will you make to your daily practices based on what you've learned today," the average desire rating was 74 ($n = 361$). Both average scores were placed toward the higher end of the evaluation scale. A correlational analysis indicated a low ($r = .33$) but statistically significant ($p < .01$) positive correlation with the gaming perception mean score. This result suggests the potential that the gaming activity could have impact in participants' future practice intentions and actions.

Of the 398 participants who completed The Safety Showdown escape room, 109 (28%) provided complete responses to the qualitative portion of this study in the delayed postsurvey. The researchers identified five categorical themes with supporting evidence: (a) positive perceptions of the learning activity, (b) teamwork, (c) critical thinking/learning, (d) changes in daily practice, and (e) negative responses, which are described briefly below and with illustrative quotations in Table 3.

An overwhelming majority of respondents indicated that they had positive perceptions of the escape room event. Participants described how the education was "innovative," "enjoyable," "interactive," and "engaging." Rather

than a typical passive event, participants' attention was held better by the "interesting" and "stimulating" active event. Some found it to better reflect "real-life experience" and to be more effective than computer-based modules.

Next, they described how the escape room employed teamwork, collaboration, and team member strengths for puzzle completion. They were "challenged...to get out of" their "comfort zone and work as a team." Participants met people from other hospital units, used communication strategies, and learned about the roles of other team members. Participants also discussed how teamwork was important for actual patient care.

Respondents indicated that the "puzzles" and "obstacles" engaged their thinking, requiring them to think in different ways than in more passive learning events. Unlike classes or computer-based learning modules, the escape room developed critical thinking that was not developed—or not even possible—when listening to lectures. Scenarios more closely mirrored real-world experiences and caused participants to apply tools used in practice.

Survey responses evidenced changes in daily practice. Several participants indicated that the learning experience grew their awareness of the practice protocol, risk factors for falls, the importance of the fall score, and patient safety concerns. Although some participants stated they were already implementing safety measures, many others described using more devices, such as mobility devices, enclosed beds, gait belts, safety equipment, and bed/chair alarms. Interestingly, some indicated that teamwork had increased between roles—and in and among units. There were some criticisms of the escape room. Some participants preferred the convenience of computer-based learning. However, a few of these did indicate that, even though they preferred online

learning, the interactive learning strategy was an acceptable alternative to other in-person class options. In summary, most participants described positive perceptions toward the educational escape room. It was quite different from other passive educational offerings and was often described as fun, creative, thought-provoking, team-building, and effective.

DISCUSSION

Various studies have published positive student participant perceptions of educational escape rooms. This study expands on those results with the collection of caregiver perceptions with a continuing professional development educational escape room. Like those results previously published, The Safety Showdown escape room was positively perceived by all participants. These positive perceptions were not significantly impacted by age, gender, licensure level, or other collected demographic information. However, there was a slightly higher perceived value of the innovation for those who have been in their current role for less time. This may indicate that these individuals have received less training on fall prevention and therefore found more perceived value in the education.

Much like other studies on educational escape rooms, participants in this study had positive perceptions of the learning event as well as the opportunity to work as a team and use teamwork skills (Kutzin, 2019; Morrell & Eukel, 2020b; Morrell et al., 2020; San Martin et al., 2021). As in other studies, participants in this study reflected on thinking through puzzles and improving content knowledge (Morrell & Eukel, 2020a; Morrell et al., 2020). Although few other studies have indicated changes in nursing practice or just the intent to

Theme	Illustrative Quotes
Positive perceptions	<p>"I liked that it was not just information being presented but it was an activity to enhance learning."</p> <p>"It was by far the most effective. I learn more by doing and acting out roles so that was a huge difference than sitting and listening to a video or power point."</p> <p>"It was fun working with others to solve the 'problem' of escape. The creative approach has helped me remember the experience in more detail."</p>
Teamwork	<p>"It was a unique way to review the importance of correctly assessing a fall risk patient, while also encouraging teamwork with different roles and staff from other units that you normally don't collaborate with."</p> <p>"I loved working together as a team to solve the problems. More than likely if you couldn't figure it out, one of your team members would assist and come together to solve it."</p>
Critical thinking	<p>"I like it a lot better than lectures or eLearning, [sic] it truly made you think and learn the material."</p>
Changes in practice	<p>"I scale my patients more adequately, and I no longer hit 'all' for interventions."</p> <p>"I pay more attention to the scores and the implementation of appropriate criteria. I am more aware of patients who are moderate to high fall risks and make sure appropriate fall prevention measures are in place while in transfers and before leaving the room."</p>
Negative responses	<p>"I liked that it was more interactive and kept my attention longer than a typical lecture or eLearning [computer-based learning] would; however, eLearnings are much more convenient because I can do it while at work and don't have to come in on a day off or rearrange my work schedule to be able to come."</p> <p>"I was often confused as to what to do. I had no escape room experience."</p>

change practice (San Martin et al., 2021), this study demonstrated actual practice change within the months after the event.

The authors suggest the following tips for NPD staff seeking to design and implement an escape room. First, pilot test all puzzles before the live event, even multiple times, to ensure accuracy and appropriate task design (Eukel & Morrell, 2020). Anticipate the need to be flexible during the live event, as unforeseen challenges may arise. Have fun and show enthusiasm as caregivers feed off that energy; learners may be apprehensive about a new learning experience. In addition, do not be surprised if not all learners like the new learning format. Finally, rather than developing and implementing an event like this on your own, invite a team of individuals with similar goals to ideate, share the load, and make the event extraordinary.

This study had some limitations. It occurred at one hospital site, so study results are not necessarily generalizable to other settings. Utilizing e-mails for the collection method of the second survey was less than ideal, as many caregivers do not regularly check company e-mail.

CONCLUSION

The implementation of a patient safety and fall prevention escape room was perceived as a positive and effective teaching method by inpatient acute care caregivers with varying experience levels. The use of puzzles encouraged participants to critically think and work together as a team in an engaging setting compared to traditional, passive teaching methods. Moreover, they reflected on practice changes that had occurred in the time after the educational event. As identified in the scope and standards of practice, NPD staff are central to the development of innovative teaching practices that focus on identified learning needs, include the perspective of key stakeholders, are collaborative, and support positive practice change and patient outcomes (Association for Nursing Professional Development, 2016). This escape room is an innovative way to engage learners in meaningful learning that supports positive practice change.

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