

**USE OF THE PATIENT FALL PREVENTION REMINDER CHECKLIST TO
INCREASE HEALTH CARE PROVIDER AWARENESS AT THE PHILIPPINE
CHILDREN'S MEDICAL CENTER**

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ABSTRACT

BACKGROUND: Falls in the hospital are preventable. Prevention of fall requires cooperation from the health care provider, caregivers, as well as the hospital administration. This study was done to utilize standard reminders for fall to increase the awareness of health care providers of a tertiary hospital for children.

OBJECTIVES: To determine the effectiveness of the Patient Fall Prevention Reminder Checklist in increasing the awareness of health care providers of patients admitted at the Philippine Children's Medical Center.

METHODOLOGY: After obtaining permission to use an established Patient Fall Prevention Reminder checklist from the Intermountain Health Care (USA), participants were recruited after giving their informed consent. A pre-test was conducted to gauge the awareness and practices of the participants in preventing falls in the hospital. After the pre-test, the tool was introduced and discussed by the author to the participants. After 7 days, the participants were followed up to take the post-test. Data collected were encoded then analyzed through descriptive statistics.

RESULTS: There were one hundred twenty-one (121) respondents with 42 males and 79 females. There is an increase in awareness in fall prevention among the residents and nurses, based on their pre and post-test examination results. The midwives had previous awareness in preventing falls even prior to the study.

CONCLUSIONS AND RECOMMENDATIONS: The checklist served as an effective tool in increasing the awareness of most study participants. We recommend the establishment of an institutionalized Fall Prevention Reminder Checklist at the Philippine Children's Medical Center for use by health care personnel.

KEYWORDS: Fall Prevention, Fall Prevention Checklist, Health Care Provider

INTRODUCTION

Falls can lead to potential injury and other negative outcomes such as increased length of hospital stay and costs. The health care provider has a responsibility in keeping every admitted child safe.

Falls, which may occur in the hospital or at home, continue to be a heavy burden in the continuum of care of all medical professionals. Fall is one of the most common injuries requiring medical care and the most common non-fatal injury requiring hospitalization. Available data states that 2.8 million children are treated at the emergency department due to fall-related injuries; most of whom are children under five years of age probably due to curiosity and development of motor skills.¹Falls are the most frequent cause of any injury during infancy with an estimated ratio of 35.1 per 1000 infant-years.¹A retrospective chart review done by Schaffer, et. al last 2011 on 100 identified fallers and 100 non-fallers noted that most falls occur 81% of the time at pediatric inpatient units, 87% in the child's room, and 22% when the child is going to the bathroom.¹⁰In Philippine Children's Medical Center (PCMC), there is an increasing incidence of fall from the year 2013 to 2017, with an average number of 24 fall incident per year.

There are several reasons why children of all ages are at an increased risk for fall especially in the hospital setting. One of the identified reasons is that the child is in an unfamiliar place and people, rendering his/her movement to be erratic. An infant or

toddler is also still developing strength and coordination. In addition, the child may be taking certain medications during the admission that may cause numbness, dizziness or cause the child to make him/her weak, confused, or impair the senses. Another factor would be contraption-related injuries such as that sustained during use of wheelchairs, having tube drains, equipment monitors, and intravenous pumps or tubing, all of which contribute to difficulty in ambulation and predisposing the child to an increased risk for fall.

In the hospital setting, considering these factors, a fall prevention checklist was developed by the Intermountain Health Care of Utah.² It aims to ensure that patient safety is a priority of every health care team member. In this light, even a seemingly mild fall can result to serious bleeding or injury and therefore needs to be prevented.

Until better screening tools are developed to assess risk for falls in the pediatric population, nurses should monitor their patients frequently. Accomplishing a complete fall risk screen for documentation, improving the screens in practice, documenting the risk scores in the chart, noting assessment, and implementing preventive fall measures are warranted.³In addition these activities should include reassessment and notation of changes in physiologic, motor, sensory, or cognitive status of the patients. These strategies will eventually lead to critical improvements in fall prevention screening.³

There are only a few studies on pediatric falls but what is known is that it occurs less often and estimated at 0.56 to 2.19 falls per 1,000 patient days versus 1.4 to 17.9 for adults.³ But every medical practitioner must consider that children are still at risk for injuries, from minor bruises to serious head injuries.³

This study aims to increase the awareness of health care providers of children admitted at hospitals using the fall prevention reminder checklist. This study also aims to measure the efficacy of the tool when applied to a high-volume tertiary pediatric hospital.

It has been stated that children who are at increased risk for falls are those who are still developing motor skills and curiosity. A study done in Singapore by Yee, et. al in year 2013, concluded that the presence of caregivers in the room does not prevent falls among children in the hospitals because they tend to be distracted, less attentive and less vigilant in a new environment due to stress and anxiety.⁹ Although fall occurrences may be high for the infant or toddler patients, adolescents must also be monitored since incidences of falls in the toilet have been documented. Every medical personnel must have an increased knowledge or awareness of the measures that should be employed to prevent falls in children given any setting. Therefore, formulating a checklist on fall prevention while admitted in the hospital may be an effective intervention to decrease its incidence during confinement. The use of educational resources, such as written materials appropriate to language and

reading level, can augment but not replace instruction.⁷

At the Philippine Children's Medical Center (PCMC), a pediatric tertiary specialty hospital located in Quezon City, when a patient is admitted, the nurse assigned would remind the parent or guardian on precautionary measures to prevent falls while in the hospital ward. These reminders are only verbally explained and are referred to as the "Fall Safety Orientation" for the purpose of this study. The content of the reminders may vary from one nurse to another. Once the precautions are explained, the nurse would document on the nurses' notes, the verbal interaction that transpired, and have the parent /guardian sign in a designated sheet in the patient chart. Since there is no existing checklist or guide, the instructions given to the caregivers are not standardized.

The results of the study will benefit the children admitted by instituting an intervention to prevent in-patient injury occurrences, which could result in long-term developmental effects or disabilities. This will also help the management to adopt an intervention that will decrease fall incidents which is an issue of patient safety.

According to Murphy, pediatric patients have dynamic changes and the need for an individualized plan for fall prevention is not "one size fits all".⁴ Normal developmental changes could increase the risk of fall related injuries in children, such as learning to walk, learning to use the toilet, and impulsivity related to development can raise

the chances for fall.⁴ Young children may have the tendency to run through halls or bounce on beds, while adolescents, who generally desire privacy, are at greater risk because they often resist the requirements that someone remain with them while they use the toilet or shower and are reluctant to ask for help.⁴ Children can also become hypoglycemic or dehydrated quickly, an important factor in patients who may spend hours without eating or drinking prior to a procedure.⁴

In a study conducted in Ohio, USA, by Schaffer, et. al in the year 2011, 26 (83.9%) out of 31 falls involved children who were developmentally appropriate for age. Only 2 (6.5%) children were disoriented, 22 (71%) were reported to be independent and unassisted in their mobility. In addition, 13 of the falls occurred in children younger than 3 years old and 40 occurred in children older than 3 years old.¹⁰

A study on the effects of brain injuries secondary to a trauma or fall in childhood can lead to a widespread deficit in a range of functions and the effects may be long-term. Most of the deficits occurred in higher learning skills such as organization, planning, and reasoning, which are centered in the frontal area of the brain where most brain injuries occur.⁸

There are four types of fall, namely: 1) Accidental, which includes environmental hazards like tripping or slipping or falls from bed surfaces; 2) Developmental, mainly comprised of infants or toddlers as they are learning to walk or run; 3) Anticipated

Physiological, wherein the patient's diagnosis or characteristics may predict their likelihood of falling (e.g. procedural sedation, post procedure recovery, unsteady gait); 4) Unanticipated Physiological, with no obvious risk factors identified on assessment or falls related to conditions not anticipated such as first-time seizure, adverse reactions to medications.⁵

Many risk assessment tools have been developed, and one of the most popular is the Humpty Dumpty Fall Scale.³ Although the sensitivity is 65%, the specificity of the said tool is only 26% meaning there is a 74% false positive rate.³ Another tool used was the Little Schmidy.⁴ While it performed as well as or better than other tools, some elements were not helpful in identifying patients at risk for falls, such as evaluating mental activity or cognitive impairment – an important fall predictor in adults, but less so in children.⁴

At least two factors make the development of scientific assessment tools for pediatric falls difficult. First, falls are a low-incident event in children's hospitals, and the development of valid and reliable screening tools for rare events is difficult. Second, many of the institutions where fall prevention tools are being developed and evaluated already have fall prevention programs thereby leading to a spuriously large number of false positives which overestimates the effectiveness of the checklists.

The Royal Children's Hospital Melbourne has specifically cited that the

following factors could influence the risk for fall⁶:

- Environmental Issues: Common cause of falls, some examples include inappropriate use of cot side or side rails, equipment clutter, wet floors, nurse call buttons out of patient reach or the use of faulty equipment.
- Age: Incidence data identified the adolescent group (10-17 years) have the highest risk of falls in hospital closely followed by the toddler group (1 -2 years). The developmental stage and ambulation capabilities are key potential fall risk factors.
- Medical Diagnosis: Various medical conditions may increase a child's risk of falling. Some high-risk diagnosis includes drop seizures, severe ataxia, epilepsy surgery or patients who have had a craniectomy.
- Mental State: Altered mental state is the most commonly identified risk factor for falling and is perhaps the most difficult to manage in terms of minimizing the risk of falling.
- Mobility: Impaired mobility and orthopedic restrictions are key potential fall risk factors.
- Elimination: Special toileting needs are a factor for increased risk of falling.

- Bedrest: Majority of falls occur at the patient's bedside due to inappropriate bed positioning, defective brake locks, and defective or inappropriately used bed rails.
- Medications: Use of medications such as barbiturates, phenothiazines, sedatives, hypnotics, antidepressants, laxatives and diuretics may increase the risk of falls.
- Length of Stay: Incident data showed that most of the patients had a fall injury in the first 5 days of admission and have had previous admissions in the hospital.
- History of Falls: Patients who have a history of falls in hospital or at home have an increased risk of falling again.

While normal developmental growth may explain why younger children have the highest incidence of hospital falls, the cognitive and motor impairments commonly seen in hospitalized adolescents who have experienced traumatic brain injury or neurological impairment may explain why this age group is reported to have the second highest incidence of falls.⁷

A study on fall prevention in the presence of caregivers was done in Singapore by Yee, et. al in 2013 showed a reduction of in-patient fall incidents with the use of posters and reminders list.⁹The experience gained from this project led to improvement in communication among staff members and caregivers which led to a

positive change in practice.⁹This study therefore aims to employ a similar strategy to increase the knowledge of the medical professionals as an initial step towards fall prevention.

A medical practitioner must bear in mind that hospitalization of children provides an opportunity to reinforce information and education among caregivers regarding normal psychological and motor development of small children which is related to risk of fall thereby decreasing incidence of fall inside and outside the hospital.⁶

OBJECTIVES OF THE STUDY

General Objective

To determine the effectiveness of the Patient Fall Prevention Reminder Checklist in increasing the awareness of caregivers of patients admitted at the Philippine Children's Medical Center.

Specific Objectives

1. To describe the demographic profile of healthcare provider participants in this study.
2. To determine if the use of the Fall Prevention Reminder checklist increased the awareness of health care professionals

METHODOLOGY

This research used a descriptive paired sample study design. Convenience sampling was used. Doctors, nurses, and midwives of PCMC were recruited to participate in the study from September 19 to October 19, 2019.

Inclusion Criteria

All resident physicians, nurses, and midwives at the Emergency Room, Intensive Care Units, Pay and Service wards.

Exclusion Criteria

Nurses, midwives, and physicians on leave for 3 or more days during the 7-day study period.

Study Procedure

The following identified clinical areas of PCMC were utilized in this study: 1) Service wards, 2) Pay wards, 3) Short Stay Unit at the Emergency Room, 4) Intensive Care Units. Before implementation, the principal investigator secured a license from the Intermountain Health Care from Salt Lake City of Utah for reproduction and internal distribution of the adapted checklist at PCMC valid for a year. The checklist, pre-test and post-test examinations underwent tool validation and appropriate revisions were made prior to data collection.

Informed consent was obtained from the study participants. A pre-tested 10-item questionnaire which used a 5-point Likert Scale was administered, followed by the

provision of the fall prevention reminder checklist. A short explanation of the checklist was given to the participants in the ward. In the interim, monitoring of any incidences of fall injuries was done. The investigator inquired for the subject's schedule on the following days for the follow-up. After seven days from the pre-test date, the same study participants underwent a post-test using the same pre-test questionnaire. The post-test also has a portion for comments and suggestions by the participants for the purpose of systems improvement. Results of the pre-test and post-test were evaluated through a scoring system and analyzed using of t-test to determine any change in score after introduction of the intervention. Each participant took 2 minutes and less to answer the pre and post-test questionnaires.

This study underwent review by the Institutional Review and Ethics Committee (IR-EC). Data collection only commenced upon approval of the board. All subjects signed an informed consent form and queries were addressed before proceeding to the study proper.

Participation in this study was entirely voluntary and they could withdraw anytime without giving any explanation. The principal investigator ensured confidentiality among the subjects as well as reassurance that their answers and scores were to be used solely for this study. There was no monetary compensation provided.

The data gathered were encoded using the Microsoft Excel. Prior to encoding,

completeness, accuracy, and consistency were checked. Control numbers represented each subject response. Each column represented the questions asked and their respective answers during the pre-test and post-test represented by nominal numbers.

Descriptive statistics such as mean and standard deviation were used to summarize the pre-test and post-test scores of the respondents. Wilcoxon signed rank test was used to determine if there was significance change in their scores from pre-test to post-test. All statistical tests were two-tailed. Shapiro-Wilk was used to test the normality of the continuous variables. Null hypothesis was rejected at 0.05 α -level of significance. STATA 13.1 was used for data analysis.

RESULTS

There were 132 respondents recruited initially in the study. However, only 121 respondents were included and 11 dropped out and were lost to follow up. Of the 121 respondents, 49 were pediatric residents in training (40.5%), 67 were nurses (55.4%), and 5 were midwives (4.1%). Forty-two (42) were males, and 79 were females.

Table 1 shows the comparison of the pre-test and post-test results of the participants of the study. There was statistical improvement of post-test scores among the residents and nurses across all items in the questionnaire based on a significant P-value of < 0.05 . As for the midwives, there was already an observed high score during the pre-test, and this was maintained during the post-test examination.

Table 1. Comparison of pretest and post-test results

	Pre test	Post test	P-value
	Mean \pm SD		
Overall (n=121)	3.90 \pm 0.68	4.35 \pm 0.66	<0.001
Resident (n=49)	3.36 \pm 0.56	3.9 \pm 0.66	<0.001
Midwife (n=5)	4.1 \pm 0.26	4.58 \pm 0.35	0.087
Nurse (n=67)	4.29 \pm 0.48	4.66 \pm 0.48	<0.001
Item 1: Brakes of beds and stretchers are locked	4.40 \pm 0.85	4.66 \pm 0.64	<0.001
Resident	3.84 \pm 0.96	4.37 \pm 0.73	<0.001
Midwife	5	5	-
Nurse	4.76 \pm 0.50	4.85 \pm 0.50	0.083
Item 2: Side rails are up and functional	4.50 \pm 0.67	4.69 \pm 0.55	0.001
Resident	4.18 \pm 0.73	4.45 \pm 0.61	0.018
Midwife	4.4 \pm 0.89	5	0.208
Nurse	4.75 \pm 0.50	4.85 \pm 0.43	0.019
Item 3: Help is made available to patients while sitting up and walking to the bathroom	3.45 \pm 0.90	4.06 \pm 0.99	<0.001
Resident	2.98 \pm 0.85	3.61 \pm 0.98	<0.001
Midwife	3	4 \pm 0.71	0.034
Nurse	3.82 \pm 0.80	4.39 \pm 0.89	<0.001
Item 4: Room has enough light	3.98 \pm 1.0	4.43 \pm 0.85	<0.001
Resident	3.29 \pm 0.89	3.88 \pm 0.93	<0.001
Midwife	4.2 \pm 0.84	4.8 \pm 0.45	0.071
Nurse	4.48 \pm 0.77	4.81 \pm 0.53	<0.001
Item 5: Talked to caregivers to prevent falls	4.28 \pm 0.99	4.64 \pm 0.65	<0.001
Resident	3.65 \pm 1.11	4.29 \pm 0.79	<0.001
Midwife	4.8 \pm 0.45	5	0.374
Nurse	4.70 \pm 0.63	4.87 \pm 0.39	0.004

Item 6: Hourly checking of patients	3.46 ± 1.18	3.97 ± 1.12	<0.001
Resident	2.55 ± 0.911	3.18 ± 1.11	<0.001
Midwife	3.4 ± 0.55	4.2 ± 0.84	0.099
Nurse	4.13 ± 0.92	4.52 ± 0.75	<0.001
Item 7: Removal of unused equipment in patient's room	3.68 ± 1.22	4.17 ± 1.06	<0.001
Resident	2.69 ± 1.04	3.33 ± 1.07	<0.001
Midwife	4.8 ± 0.45	4.8 ± 0.45	1.000
Nurse	4.31 ± 0.82	4.75 ± 0.56	<0.001
Item 8: Door is always kept open	3.96 ± 1.15	4.31 ± 0.96	<0.001
Resident	3.67 ± 0.99	4.08 ± 0.86	0.001
Midwife	4.4 ± 0.89	4.4 ± 0.89	1.000
Nurse	4.13 ± 1.24	4.46 ± 1.02	0.021
Item 9: Bed is kept in lowest position	3.79 ± 1.02	4.40 ± 0.86	<0.001
Resident	3.33 ± 0.97	3.96 ± 0.96	<0.001
Midwife	4.4 ± 0.55	4.6 ± 0.55	0.621
Nurse	4.09 ± 0.97	4.72 ± 0.65	<0.001
Item 10: High risk patients are placed close to the nurses' station	3.54 ± 1.09	4.17 ± 1.02	<0.001
Resident	3.37 ± 0.97	3.86 ± 1	<0.001
Midwife	2.6 ± 1.14	4 ± 1.73	0.052
Nurse	3.73 ± 1.12	4.40 ± 0.92	<0.001

The investigator also included additional questions in the post-test examination. The first question is, "Did the Fall Prevention Reminder Checklist helped you increase your awareness to prevent fall?" which is answerable by yes or no. All 121 respondents answered yes.

The second question was, "Do you have comments or suggestions to prevent incidences of fall in the hospital?" which

was optional for the participants to fill in. Most of the responses pertain to changing of the busted hospital beds and stretchers as well as adding more beds to increase occupancy therefore preventing 5 children in 1 bed. This is most true at the Emergency Room. Others commented on adding more hospital staff to be able to monitor patients more closely. While others commented on agreeing with the development of the checklist, some also suggested putting the

checklist on the walls of the hospital premises. There were also concerns about permitting another watcher at the bedside so that they will be able to take turns in taking care of the patient especially when they feel sleepy and exhausted. Previously reported cases of fall were children sleeping on the lap of the watchers who also fell asleep. There was one respondent who suggested to tag patients who are at increased risk for fall to alert other medical staff.

In summary, most of the concerns were included in the checklist hence, positive feedbacks from the respondents were gained.

DISCUSSION

Fall in an already hospitalized child is an event that every healthcare provider must prevent. In a study conducted by the American Academy of Sleep Medicine, 40% of in-hospital pediatric accidents result from fall.¹¹ Not only does it increase hospital stay, but the fear of a serious sequelae that it could do to a growing child's brain and bones are the greatest consideration.

Fall is one of the most preventable events in a pediatric hospital. With proper education and reminders to the caregivers of these patients, incidences of fall may be reduced. However, for this to happen, increased awareness of health care providers is needed to deliver appropriate education to caregivers and patients. Also, prevention of fall should always be a joint effort with the hospital administration in order to address external factors including replacement of

defective beds and stretchers, standardization of a fall prevention program, and proper dissemination of information to all health care providers in an institution.

Checklists are effective tools in reinforcing standard of care. A study conducted in Australia using checklist and reminders in clinical pathways to improve hospital in-patient care revealed significant improvements in the quality of patient care.¹² Another study conducted by Ethics consultants aiming to improve quality of ethics consultation by providing reminders about process steps that are important for most patient-centered ethics consultations and consistency, showed improvement in overall quality of the subjects.¹³

An article by Physician-Patient Alliance for Health and Safety discussing the benefits of adopting patient safety checklists stated that these tools provide a sense of confidence that you have taken all the right steps, are effective at reducing medical mistakes therefore reducing litigation costs, provide technical solutions for technical problems and are free.¹⁴ Checklists are gaining popularities not only in the in-hospital patient care but as well as the out-patient care. Health care professionals should continue to explore and device checklists in improving health care system.

Data analysis of the scores of the pre-test and post-test in each question showed a statistically significant increase in awareness in both the residents and nurses ($p < 0.05$).

This study was conducted to develop an institutionalized fall prevention checklist that is applicable for health care providers in a tertiary pediatric hospital in a developing country with increasing incidence of fall. Installation of call lights in each room in the wards may be made part of the priority equipment to be procured by the hospital. Replacement of beds and stretchers with busted side rails and locks is warranted. Moving patients at risk for fall close to the nurse station is not always applicable given the setting of this institution. The treatment room, which is closest to the nurse station, is where patients who are critically ill are placed. However, this room can only contain 1 to 2 patients.

CONCLUSION

We were able to administer the Fall Prevention Reminder Checklist to 121 participants after administering a pre-test examination. The pre-test examination assessed the baseline awareness of the participants seen through pre-test scores which notably increased in the post-test examination done after 7 days from the time of the administration of the checklist. Results showed that a fall prevention reminder checklist significantly increased the awareness of health care providers which would help in preventing the occurrence of fall. In addition, educating caregivers about ways to prevent fall would become more effective if the health care providers are more knowledgeable on fall prevention practices.

Development of a standardized Fall Prevention Reminder Checklist for PCMC is recommended based on the findings of this study. This will promote uniformity and standardization of fall prevention reminders. In addition, educating caregivers about ways to prevent fall would become more effective if the health care providers are more knowledgeable on fall prevention practices.

We commend research that directly involves the caregivers, as in the use of a fall prevention checklist written in vernacular, or reminders in illustration, whichever is most effective. Use of Risk Assessment Tools for Fall which can be effective in identifying patients who should be closely monitored may also be used in future studies.

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