

# Nursing Students' Intention to Report Medication Errors

## *Application of Theory of Planned Behavior*

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### ABSTRACT

**Background:** Reporting, investigating, and full disclosure of medication errors (MEs) is a fundamental component of patient safety. Therefore, determining nursing students' intention to report MEs is important.

**Purpose:** This study examined the factors related to nursing students' intention to report MEs and the use of the Turkish version of the Theory of Planned Behavior Medication Safety Questionnaire (TPB-MSQ-T).

**Methods:** A descriptive cross-sectional design was used with a sample of 227 undergraduate nursing students in Istanbul, Turkey. Students' intentions to report MEs were measured using an online TPB-MSQ-T. Quantitative analysis was conducted.

**Results:** Attitudes and perceived behavioral control (PBC) were significant predictors of intention to report MEs ( $P = .05$  and  $P = .01$ , respectively), but subjective norms did not predict it ( $P = .11$ ). The Cronbach's  $\alpha$  of the questionnaire was 0.88.

**Conclusions:** Attitude and PBC are important determinants of nursing students' intention to report MEs. The TPB-MSQ-T can be used for identifying the main determinants of intention to report MEs.

**Keywords:** intentions, medication error, nursing students, theory of planned behavior

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Efforts to enhance medication safety are a global health priority.<sup>1-4</sup> Medication errors (MEs) are among the ones that have potential risks to decrease medication safety worldwide.<sup>2,3,5</sup> Internationally, the cost associated with MEs has been estimated at \$42 billion USD annually.<sup>4</sup> According to reports of the Agency for Healthcare Research and Quality, hospitalized patients have a major risk for MEs, with 5% experiencing an avoidable adverse event from an ME. The high rates of MEs have led to dissatisfaction and fear among patients and health care professionals, and delayed treatment and care.<sup>2,6</sup> Thus, preventing MEs is a high priority, and the World Health Organization (WHO) has a goal of globally

reducing avoidable harm related to medications by 50%, by 2022.<sup>4</sup>

A process that comprises error reporting, investigating, and full disclosure is important to reduce MEs.<sup>1</sup> Various approaches have been used to report MEs in health care settings. It is known that voluntary, timely, accurate, and nonpunitive reporting promotes medication safety.<sup>1</sup> Nurses have important roles in preventing and reporting MEs. However, several studies have reported that ME reporting rates among nurses, especially novice nurses and nursing students, are low.<sup>6-10</sup> Results from 2 systematic reviews suggest higher rates but underreporting of MEs among nursing students.<sup>11,12</sup> Issues identified in the literature include complex reporting systems and working conditions; fear of the reaction to disclosure of the error from superiors and colleagues; lack of knowledge, experience, and guidance; lack of ME reporting systems; the fact that MEs did not result in the death or inability of the patient; and attitudes, which were potential factors associated with reporting MEs among nursing students.<sup>9,12-15</sup>

In Turkey, most research on factors related to ME reporting has been conducted with nurses, and little is known about the associated factors related to reporting MEs among nursing students. Some studies among nursing students identified lack of knowledge and experience, poor communication, and carelessness were factors associated with reporting.<sup>10</sup> In another study involving nursing

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students, fear of getting low grades and limited access to an error report system were factors.<sup>8</sup>

In addition to environmental and organizational factors, ME reporting is an individual behavior that is strongly influenced by intention, which is a predictor of actual reporting behavior. It is known that behavioral intention toward ME reporting is an important factor associated with reporting.<sup>14-16</sup> The Theory of Planned Behavior (TPB), designed by Ajzen, is one of the most common used theoretical approaches for understanding behaviors and attitudes and has been used to examine medication safety practices.<sup>14,17-19</sup> Behavioral intention is the basic determinant of the behavior according to the TPB and is determined independently by 3 constructs: attitudes, subjective norms, and perceived behavioral control.<sup>17</sup> Attitudes refer to an individual's positive or negative disposition when performing a particular behavior. Subjective norms refer to perceptions about how others would judge a person for performing a specified behavior. When applied to medication safety, it is a measure of how students perceive the opinions of other health professionals, patients, and family members. The third component—perceived behavioral control refers to self-assessment of one's capability or skill and the actual opportunity to perform the desired behavior. It is also a critical factor that influences students' intention to practice in a way that improves ME reporting.

A tool based on the TPB, the Theory of Planned Behavior Medication Safety Questionnaire (TPB-MSQ), has proved to be valid and reliable when used to assess behavioral intention in relation to medication safety.<sup>14</sup> A search of literature showed that there was no formal translation of the TPB-MSQ in Turkish, and there is no other tool to evaluate behavioral intentions related to ME reporting that has a multidimensional measure in Turkey. As the intention is the important priori of actual behavior, it is essential to understand it for designing interventions to improve ME reporting in practice. Although studies investigating the factors of behavioral intentions in relation to ME reporting have increased in several countries,<sup>14-16</sup> no studies have investigated this issue based on a TPB construct in Turkey. Therefore, the aim of this study was to determine factors related to the intention to report MEs and the use of the Turkish version of the TPB-MSQ (TPB-MSQ-T).

## Methods

### Design, Sample, and Setting

A descriptive cross-sectional design was used. A convenience sample of 227 undergraduate students was recruited from the bachelor's degree nursing program at 2 state universities in Istanbul, Turkey. The inclusion criteria for the study were nursing students who were in their final year of a 4-year BSN program during the spring term of 2018 (March to June 2018) and agreed to participate in the study. The exclusion criteria were nursing students in other years of the program. Ethical approval was obtained from Istanbul University Social Sciences and Humanities Ethics Committee (IRB number: 2017/118), and the support for the study was also obtained from the 2 nursing schools' principals to access undergraduate nursing students.

## Instruments

The instrument used was the TPB-MSQ developed by Lapkin et al.<sup>14</sup> It is based on the TPB and adapted for this study according to the recommendation of the WHO.<sup>20</sup> It was translated into Turkish and back-translated into English. Its validity was examined by 9 experts who were nursing academicians. After their evaluations, the Turkish version of the questionnaire (TPB-MSQ-T) was formed. The content validity index (CVI) for the questionnaire was 0.93.

The TPB-MSQ included 4 scenarios and 44 items. The scenarios focused on behaviors related to (1) managing MEs, (2) open disclosure, (3) managing interruptions during prescribing and administering, and (4) person-centered care in relation to educating patients about their medications. In the questionnaire, items assess the attitudes (15 items), behavioral control (13 items), and subjective norms (12 items), and a single item measures behavioral intention in relation to each scenario.<sup>14</sup> The questionnaire uses a 7-point Likert scoring method (1, strongly disagree, to 7, strongly agree), with higher scores indicating a stronger intention to perform the target behavior. The 4 intention questions were scored using binary response options (yes/no). The TPB-MSQ-T revealed a Cronbach's  $\alpha$  of 0.88, and Cronbach's  $\alpha$ s for the subscales are as follows: 0.72 for attitude, 0.76 for perceived behavioral control, and 0.69 for subjective norm (Table). The sociodemographic information form measured age in years, gender (female or male), and having had experiences about medication safety.

## Procedures

A questionnaire composed of demographic questions and the TPB-MSQ-T was administered through an electronic survey software and a paper-based questionnaire. The questionnaire took approximately 15 minutes to complete.

## Statistical Analysis

Data were entered into an electronic survey and were downloaded into a Microsoft Excel file. The SPSS version 23.0 (IBM Corp, Armonk, New York) was used for the analysis. Descriptive statistics were performed for the demographic characteristics of the sample and items, including the skewness and kurtosis indices to ascertain normality.

**Table. Means, Standard Deviations, and Cronbach's  $\alpha$ s of Research Variables**

Variables <sup>a</sup>	No. Items	Mean	SD	Cronbach's $\alpha$
Attitude	15	5.12	0.76	0.72
Subjective norm	12	4.64	0.80	0.69
Perceived behavioral control	13	4.44	0.81	0.76
Total TPB-MSQ-T	40	4.76	0.68	0.88

<sup>a</sup>Range of all variables is 1-7.

The reliability was assessed using the Cronbach's  $\alpha$ , and the validity was assessed using the CVI.

Multiple linear regressions were conducted to further explore the association between these variables. In all analyses, the dependent variable was the behavioral intention (yes/no questions), and the independent variables were attitude, perceived behavioral control, and subjective norm. The level of significance was set as .05.

## Results

### Sample Characteristics

Two hundred sixty-three participants completed the survey for a response rate of 53%. After data collection, 36 individuals were excluded from the analysis because they did not answer all the relevant items in the survey. This resulted in 227 individuals included into the analyses of this study. The mean (SD) age of the participants was 22.58 (2.57) years. Most participants were female (92%) and had experiences about medication safety only in their courses (80%).

### Factors of Intention to Report MEs

The mean score of TPB-MSQ-T was 4.76 ( $\pm 0.68$ ), skewness was  $-0.37$ , and kurtosis was  $0.07$ . The mean (SD) scores of attitude, subjective norm, and perceived behavioral control were 5.12 (0.76), 4.64 (0.80), and 4.44 (0.81), respectively (Table).

Behavioral intention was significantly and positively correlated with perceived behavioral control,  $r = 0.410$ ,  $P < .01$ ; attitude,  $r = 0.392$ ,  $P < .01$ ; and subjective norm,  $r = 0.380$ ,  $P < .01$ . Attitude was also positively correlated with the other 2 predictor variables: subjective norm,  $r = 0.638$ ,  $P < .01$ , and perceived behavioral control,  $r = 0.624$ ,  $P < .01$ . In addition, there was a significant positive correlation between perceived behavioral control and subjective norm,  $r = 0.627$ ,  $P < .01$ .

It was found that only attitude ( $\beta = 0.168$ ,  $P < .05$ ) and perceived behavioral control ( $\beta = 0.222$ ,  $P < .05$ ) were significantly and positively related to behavioral intention. Attitude emerged as the most significant predictor accounting for 15% (15% adjusted) of the variance in behavioral intentions. The addition of subjective norm increased the amount of variance explained in intention (18% adjusted). When all the variables were entered into the regression equation, they emerged as significant predictors and explained 21% (20% adjusted) of the variance in behavioral intention in relation to practicing in a way that enhances medication safety (Supplemental Digital Content, Table, <http://links.lww.com/NE/B10>).

## Discussion

Medication errors have important implications for medication safety, and reporting them is vital to reduce MEs in health care settings. Engaging in reporting MEs is intentional; therefore, developing a deeper understanding of the processes involved in volitional behavior such as intention to report MEs is important. In the current study, the factors related to the intention to report MEs were examined. To

our knowledge, this is the first study reporting the factors of behavioral intention toward ME reporting of nursing students using the TPB. The study results showed that the constructs of intention could successfully predict the intention to report MEs among nursing students.

Consistent with the TPB, the constructs of attitude, subjective norms, and perceived behavioral control were found to have significant correlations of varying intensity with students' intention to report. That is, the more positive students' attitude concerning reporting MEs, the higher their perceived behavioral control to report, and the higher the subjective norms, the higher their intention to do so. These results are similar to findings from several studies in Japan, Israel, and Australia.<sup>14,16,21</sup> However, results of the regression analysis identified that only attitude and perceived behavioral control were significantly and positively related to intention in this study. Similar findings were reported in several studies. In a study by Lapkin et al,<sup>14</sup> educational approaches that aimed to improve communication, teamwork, and confidence with colleagues influence students' attitudes and intentions. Similarly, Natan et al<sup>15</sup> reported that improving students' awareness about medication safety issues made them self-confident and more responsible to report MEs. Additional research is needed to clarify the relationship between subjective norms and intention to report MEs behavior in Turkish students.

Consistent with previous studies,<sup>14,15,21-23</sup> attitudes were found to be the strongest predictor of intention to report MEs in this study. The need to increase positive attitudes toward reporting MEs among students is important, and thus, teaching strategies should be implemented to encourage development of these attitudes. An attractive strategy for students could be simulation-based nursing education that gives students opportunities to gain real-life situational experience, which could improve their attitudes.<sup>14</sup>

The use of innovative approaches such as multimedia resources and e-learning activities for teaching may also improve attitudes.<sup>16</sup> Furthermore, previous studies have suggested interprofessional education (IPE) as a method for influencing the attitudes of health professional students to promote communication, collaboration, and medication safety.<sup>14,24,25</sup> In addition, it is strongly suggested to integrate IPE into curricula for teaching medication safety.<sup>14,26</sup>

In this study, perceived behavioral control was also a predictor of intention to report MEs indicating that, as the students' control over their behavior increases, their intention to report MEs increases. The behavioral control score was rated the lowest compared with the other factors. This could be due to students feeling that, as students, reporting MEs may not be completely within their control. In Turkey, students give medications under the supervision of an RN. Teaching students behavior control is therefore important for intention to report MEs. This can be taught by empowering students through role playing, and role modeling a clinical scenario may enable them to enact their intention to report MEs in clinical situations. Including control

expectations for each step of ME reporting and identifying and addressing barriers to the behavior might be beneficial. To this point, as mentioned by Levett-Jones et al,<sup>26</sup> the TPB-MSQ used in this study may provide educators with a valid tool for assessing learning outcomes in relation to safe medication administration practices and the evaluation of IPE activities.

### Limitations

Data were collected from a convenience sample from only 2 state nursing schools, so the findings may not be generalizable to all nursing students in Turkey or in other countries. Future studies should involve larger, representative samples of Turkish nursing students. This study explored students' intention to report rather than actual reporting, so there may be a social desirability bias.

### Conclusion

The study results reveal that attitude and perceived behavioral control were significant predictors of intention to report MEs, but subjective norms did not predict it. A clear understanding of the factors of behavioral intention toward MEs among undergraduate nurses is important to facilitate students' active involvement in medication safety and for the design of effective interventions and preventive efforts to reduce MEs. The TPB-MSQ-T can be used for measuring intentions and the main determinants of intention as a proxy for actual clinical behaviors in relation to medication safety.

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