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Factors and Strategies Influencing Chemotherapy Safety Among Oncology Nurses: A Qualitative Descriptive Study

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Abstract

The purpose of this research is to describe the factors that affect chemotherapy exposure and strategies to foster chemotherapy safety among oncology nurses. Fifteen oncology nurses and 5 oncology nurse managers were recruited from 2 medical centers in the Midwest United States through convenience purposive sampling. A qualitative descriptive approach was employed. Semi-structured interviews were conducted with the participants and analyzed using the content analysis method. Five main themes emerged: 1) description of chemotherapy exposure incidents, 2) nurse's personal health beliefs, 3) cues to adhere to chemotherapy handling guidelines, 4) invisible exposure to chemotherapy, and 5) strategies to promote chemotherapy safety at the workplace. Important strategies that promote chemotherapy safety for nurses are providing continuous education on chemotherapy safety, offering chemotherapy-specific equipment and personal protective equipment in several sizes, promoting nurses' health beliefs toward chemotherapy safety (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and perceived self-efficacy), supporting a culture of safety at the workplace, having policies on handling guidelines and exposure incident reporting, monitoring nurses' adherence to chemotherapy handling guidelines, using hazard labels and alerts, and monitoring chemotherapy contamination on common surfaces in oncology settings. Oncology nurses and nurse managers should be involved in designing strategies that promote nurses' chemotherapy safety.

Keywords

adherence; chemotherapy; exposure; guidelines; occupational health; oncology nurse; safety

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BACKGROUND

Health care workers who handle chemotherapy drugs experience the health effects of exposures to these hazardous drugs if not handled appropriately. Chemotherapy exposure happens when direct contact with chemotherapy occurs through dermal absorption, ingestion, aerosol inhalation, or injection with chemotherapy-contaminated sharp objects.[1] The exposure to chemotherapy occurs during chemotherapy preparation, administration, disposal, and cleaning up spills. Further, chemotherapy exposure could occur while handling chemotherapy-contaminated patient body fluids.[1]

Chemotherapy handling guidelines were published in the 1980s.[2] While exposure rates have decreased since the publication of these guidelines, oncology nurses are still experiencing exposures. Among the 1814 oncology nurse participants in the study by DeJoy et al,[3] approximately 14% indicated that they were exposed to chemotherapy through skin or had chemotherapy spill incidents in the week preceding the study. In a separate study by Friese et al,[4] 51 oncology nurses reported 61 chemotherapy spill incidents over a 2-year period from 2015 to 2017.

Chemotherapy exposure at work has been linked to serious health problems such as cancer, genetic material mutations, miscarriages, and reduced fertility.[5] Several factors have been identified that influence chemotherapy exposure among nurses. Examples of these factors are knowledge pertaining to chemotherapy safety, adherence to safe chemotherapy handling guidelines, nurses' health beliefs regarding the adherence to the guidelines as preventive health behaviors, workload, managerial support for nurses, and the availability of institutional policies regarding chemotherapy safety in oncology settings.[6-8]

There is limited evidence in the literature on factors that influence chemotherapy exposure and strategies to foster chemotherapy safety among oncology nurses from the perspective of oncology nurses. Further, very few studies involved oncology nurse managers to understand the factors at the administrative levels and ways these factors could be addressed. The purpose of this research was to describe the factors that affect chemotherapy exposure among oncology nurses and strategies to foster chemotherapy safety by eliciting the perspectives of nurses and nurse managers.

METHODS

A qualitative descriptive approach was employed.[9] The institutional review board approval and waiver for consent documentation were obtained.

Participants and Setting

Participants were recruited from 2 large medical centers in the Midwest United States (US) through convenience purposeful sampling. Directors in the medical centers were contacted and asked to send the study flyer to their oncology nurses through email. The flyer contained information on the study, a link to the study information sheet in REDCap (Research Electronic Data Capture), a web-based data collection application,[10,11] eligibility criteria, and the contact information of the principal investigator. Eligibility criteria for participation

were as follows: 1) age ≥18 years, 2) working as an oncology nurse or oncology nurse manager for at least 3 months, and 3) handling chemotherapy drugs if the participant was an oncology nurse. Interviews were scheduled with interested participants who contacted the principal investigator.

Data Collection

Semi-structured, individual interviews were conducted with the oncology nurses and oncology nurse managers by phone. Oncology nurses were asked to describe their experience of handling hazardous drugs, as well as the personal and workplace factors that predispose them to be exposed to chemotherapy, using open-ended questions. Questions on personal health beliefs and cues to adhere to chemotherapy handling guidelines were based on the Health Belief Model.[12,13] According to this model, oncology nurses' health beliefs toward chemotherapy safety (perceived susceptibility to acquire the health complications of chemotherapy exposure, perceived severity of the exposure effects, perceived barrier to adhere to handling guidelines, perceived benefits of adherence to the guidelines, and perceived self-efficacy to adhere to handling guidelines) and relevant cues in the environment influence their adherence to the chemotherapy handling guidelines as preventive health behaviors. Figure 1 presents the conceptual model of the study that is based on the Health Belief Model. Oncology nurse managers were asked about their viewpoints of the contributing factors to chemotherapy exposure among their nurses at the administrative levels. Both oncology nurses and managers were asked to provide relevant strategies that may promote chemotherapy safety for oncology nurses. The interviews were audio recorded and transcribed verbatim. Each participant was paid $30 as compensation for their time.

Data Analysis

Content analysis was used to analyze the transcribed interviews.[9] Initially, 2 investigators independently read each transcript several times to obtain a general essence of the data. During the second reading, the investigators began assigning a label for each strand of text using line-by-line coding, then proceeding to sentence-by-sentence coding when redundancy appeared.[9] Initial codes were grouped into main categories. In the focused coding phase, the investigators met and agreed on the most frequent and significant codes and clustered the codes into themes. The Health Belief Model was used to identify the themes related to the factors that affect oncology nurse exposure to chemotherapy.[9]

Trustworthiness

Several strategies were adopted to enhance trustworthiness based on Lincoln and Guba.[14] These strategies included conducting all the interviews by 1 investigator, recording the interviews and transcribing them verbatim, performing the analysis by 2 investigators separately, and describing the study results very closely to participant responses.

RESULTS

Fifteen oncology nurses and 5 oncology nurse managers were interviewed. On average, each interview lasted 22 minutes. Table 1 presents the demographic characteristics of the

participants. The average age of the participants was 38.2 years (standard deviation [SD] = 10.8), all the participants were female, 95% (n = 19) were white, and 75% (n = 15) had a Bachelor's degree. The average clinical nursing experience for the participants was 12.7 years (SD = 10.3), and the average oncology nursing experience was 11.2 years (SD = 9.9). Four participants (20%) reported that they were exposed to chemotherapy previously, and only 1 participant (5%) stated that she was exposed to chemotherapy in the past 12 months. The routes of chemotherapy exposure were skin and mucus membrane absorption and inhalation.

Five main themes emerged from analyzing the transcribed interviews: 1) description of chemotherapy exposure incidents, 2) nurse's personal health beliefs, 3) cues to adhere to chemotherapy handling guidelines in the workplace, 4) invisible exposure to chemotherapy, and 5) strategies to promote chemotherapy safety at the workplace. Below is a detailed description of each of these themes.

Description of Chemotherapy Exposure Incidents

The following subthemes emerged from participants' description of chemotherapy exposure incidents: sharing incidents of chemotherapy exposure by other nurses, causes of chemotherapy exposure incidents, and procedures for handling the exposure incidents. Most of the exposure incidents reported by participants were witnessed by the participants or shared with them by other nurses. Participants reported that sharing these incidents with them by other nurses was informal; however, they indicated that hearing about these incidents was helpful, as they learned techniques to prevent future exposures to chemotherapy. The incidents described occurred during the procedures of chemotherapy preparation, administration, handling contaminated patient excretions, and cleaning chemotherapy spills. The reported exposure routes were skin and mucus membrane absorption and inhalation. Based on participant responses, the routes of exposure corresponded to failing to wear the appropriate personal protective equipment (PPE). For example, exposure to chemotherapy through skin occurred for a nurse who handled a chemotherapy pill without applying gloves, while exposure to splashes happened for a nurse who was not wearing a face shield while administering chemotherapy to a patient.

Participant 4 (Oncology nurse) "… we had diluted the chemotherapy in apple juice and were giving to the patient, and the patient spit out the chemotherapy, and it went on to a co-worker… but she wasn't wearing like a safe shield."

Participant 20 (Oncology nurse) "…I had touched that pill. And it's a cancer pill."

Participants described several contributors to chemotherapy exposure incidents. One of these contributors is human errors such as failure to securely connect the chemotherapy infusion set parts. Complicated chemotherapy intravenous (IV) administration set-up procedures, particularly when the patient receives several IV infusions simultaneously, increases the chance of these errors. As reported by participants, system-related factors could lead to chemotherapy exposure incidents such as the unavailability of chemotherapy-specific equipment, equipment malfunction, and the nurse's responsibility to prepare chemotherapy (most frequently, oral forms of chemotherapy that often need to be crushed and diluted

before administering them to patients). Patient-related factors were mentioned as factors leading to exposure incidents such as exposure to chemotherapy-contaminated patient's body fluids or chemotherapy spills resulting from the patient manipulating the chemotherapy infusion set.

Participant 4 (Oncology nurse) "The bag of chemotherapy was just spiked incorrectly, …, and it leaked down like all over the pump. And it got all over the floor."

Participant 11 (Oncology nurse) "I was wearing gloves, um, but when I dumped the urine into the toilet it, like, splashed back on my skin. So, I think that was really the only time I've actually had an exposure."

All participants indicated that addressing the exposure incidents was based on specific institutional procedures to handle these incidents. For example, cleaning chemotherapy spills is performed by a trained chemotherapy nurse using a chemotherapy spill kit. Additionally, most nurse participants who were exposed to chemotherapy during handling procedures reported the incidents to the chemotherapy team, leadership, and occupational health team. However, nurses identified barriers to reporting exposure incidents such as being stigmatized for making a mistake, time constraint, and the lack of long-term follow-up after an exposure incident.

Participant 13 (Nurse manager) "… we also have like policies in place for chemotherapy spills and clean up as well."

Participant 11 (Nurse manager) "We would call after the exposure if there was any follow-up needed … just the immediate (follow-up)."

Participant 20 (Oncology nurse) "I should ask her should I have done a safe care report, but I did not. I guess just being busy."

Nurses' Personal Health Beliefs

Nurses' health beliefs regarding chemotherapy safety were classified into the following subthemes: perceived susceptibility, perceived severity, perceived barriers, perceived benefits, and perceived self-efficacy. Nurse participants' health beliefs are consistent with the level of adherence to chemotherapy handling guidelines as reported by them.

Perceived Susceptibility to Acquiring Chemotherapy Exposure Health Complications

Participants' perception of the likelihood of themselves developing health complications following exposure to chemotherapy ranged from low susceptibility to high susceptibility. Based on participant responses, there are several factors that influence the likelihood of developing health complications associated with chemotherapy exposure. These factors include the type of chemotherapy drug to which the nurse is exposed, the amount of the drug to which the nurse is exposed, the route of exposure, the length and frequency of exposure, and the PPE used during the exposure incident.

Several participants indicated that the health complications associated with chemotherapy exposure, such as infertility and cancer, might not necessarily develop due to chemotherapy

exposure. A nurse's general health and health habits are examples of non-occupational factors that could lead to these complications. Some participants reported that this makes them underestimate the individual hazardous effect of chemotherapy exposure on health. Noteworthy, several participants believe that when the exposure to chemotherapy is minimal or occurs through skin contact, the risk of developing health problems is low.

Participant 6 (Oncology nurse) “I think there is a very high possibility that there is health complications.“

Participant 3 (Oncology nurse) "I feel like if we were exposed, it wouldn't be as much of a – like we wouldn't be exposed with too much of the chemotherapy, so I don't think it would cause that many complications."

Perceived Severity of Chemotherapy Exposure Health Complications

Nurses' perceptions of the severity of chemotherapy exposure health complications range from mild to severe depending on factors such as the type and amount of chemotherapy drug to which the nurse is exposed, the route of exposure, the length and frequency of exposure, and the PPE used during the exposure incidents. Many nurse participants were unaware of examples of severe chemotherapy exposure complications such as cancer. Several participants reported that they noticed trends of fertility problems and miscarriages among peers, even those who adhere to chemotherapy handling guidelines. This influenced their perceived susceptibility to developing chemotherapy health complications and the perceived severity of these complications.

Participant 11 (Oncology nurse) "How severe? Um, I feel like it depends on the exposure. Um, like if it was like an IV-like dose, and it got on your skin."

Participant 8 (Oncology nurse) "I mean obviously severe. It's not great that you should get exposed to that, especially if you are not the one getting it."

Perceived Benefits of Adhering to Chemotherapy Handling Guidelines

Most nurse participants mentioned that by adhering to chemotherapy handling guidelines, they could protect themselves from chemotherapy exposure health complications. Also, this helps prevent contaminating common areas in the workplace with hazardous substances.

Participant 7 (Oncology nurse) "I feel like if you take the proper precautions with wearing the face shield, the gown, and double gloving, then you are doing everything to protect yourself from the hazards of chemotherapy."

Perceived Barriers to Adhering to Chemotherapy Handling Guidelines

Participants reported several barriers to adherence to chemotherapy handling guidelines. Unavailability of chemotherapy-specific PPE and equipment was the most frequently reported barrier by the participants (n = 9), followed by time constraint due to high workload (n = 8), insufficient education and training on chemotherapy safety (n = 8), lack of formal supervisory monitoring of nurses' adherence to the guidelines (n = 7), unavailability of chemotherapy-specific equipment in several sizes (n = 5), and negative

influences from coworkers who underestimate the importance of following chemotherapy handling guidelines (n = 4).

Participant 2 (Oncology nurse) "I would say time constraints. If you're rushed and trying to do something really quickly, and you feel like you don't have time to put on all of those things."

Participant 6 (Oncology nurse) "I think it's – you know, you can get a little bit of groupthink, and so, if somebody is like anti-wearing a gown, all of a sudden, the whole shift of people is anti-wearing the gowns."

Perceived Self-Efficacy to Adhere to Chemotherapy Handling Guidelines

All nurse participants reported moderate to high confidence in their ability to adhere to chemotherapy handling guidelines. The level of confidence to adhere to the guidelines reported by the participants corresponds to the degree to which they adhere to the guidelines as reported by them.

Participant 9 (Oncology nurse) "I'm pretty confident. I know how to protect myself and family members in the room from it."

Cues to Adhering to Chemotherapy Handling Guidelines in the Workplace

The nurse participants indicated that environmental cues help in improving their preparedness to adhere to chemotherapy handling guidelines. Examples of these cues are the presence of posters displaying these guidelines in the work setting, hazard signage on chemotherapy bags that illustrate the potency of the drug and the health complications associated with the exposure to it; information in the electronic health record on the hazardous effects of a chemotherapy drug and the precautions that should be taken when handling it; informal personal reminders from peers to adhere to chemotherapy handling guidelines; and the requirement that 2 nurses verify, administer, and document the chemotherapy administration process.

Participant 12 (Oncology nurse) "… the labeling of the chemotherapy agents themselves have labels on them … that we document med administration in the computer also flags what type of agent it is."

Participant 8 (Oncology nurse) "Like someone telling you, like, 'Hey, like don't forget your gown' or 'Hey, don't forget your mat' … Like actual verbal cues."

Invisible Exposure to Chemotherapy

Several nurse participants stated they were exposed to chemotherapy via indirect exposure. Many of them believe that indirect exposure to chemotherapy could lead to chemotherapy exposure health complications (ie, infertility, miscarriage) among peer oncology nurses who follow chemotherapy handling guidelines. Moreover, some participants mentioned behaviors by other nurses that could lead to contaminating common work areas and break rooms with chemotherapy, such as touching the outer surface of chemotherapy bags with bare hands, placing chemotherapy bags on the counter or nurse computer desks, and failure to wear the

necessary PPE when handling chemotherapy. Additionally, a nurse participant mentioned that equipment in patient rooms that undergo only regular cleaning procedures could be a source of invisible exposure to chemotherapy for nurses and other staff who touch this equipment without wearing chemotherapy-specific PPE.

Participant 5 (Nurse manager) "I think making all of our gloves chemotherapy safe on our unit is huge, um, because, like, that silent exposure that we don't really, um, know about."

Participant 16 (Oncology nurse) "My concern, really, is not even so much as formal exposures … my main concern is really the exposures that we may not know about – … if chemotherapy ends up on the pumps or on our computers or things like that, and then we go behind and touch that equipment with our bare hands."

Strategies to Promote Chemotherapy Safety at the Workplace

The participants mentioned several strategies to promote chemotherapy safety among oncology nurses and foster their adherence to chemotherapy handling guidelines. They stated that education regarding chemotherapy exposure and training on proper techniques of handling chemotherapy are essential. Easily accessible sources of information, such as books, websites, pharmacists, and chemotherapy-trained health care workers, are important to address any inquiry that nurses have. New and novice nurses should be monitored and supervised by experienced nurses while handling chemotherapy until they master safety practice skills. Regarding the educational posters on chemotherapy exposure risks and handling guidelines, participants suggested that these posters and their locations should be changed periodically to maintain nurses' interest and attention toward them. Moreover, participants indicated that incorporating pop-up messages in the electronic health records regarding hazardous drug handling would be better than including a link to this information. Nurses under time pressure may skip accessing these links and overlook important information on safety practices. Particularly important, the participants suggested that descriptions of chemotherapy exposure incidents should be formally shared with other nurses to provide an opportunity for all nurses to learn from real-life incidents.

On the other hand, nurse participants stressed the importance of offering all chemotherapy-specific equipment and PPE, storing them in multiple convenient locations in the work area, offering PPE in several sizes, and regularly checking the functionality of chemotherapy-specific equipment. The nurse participants indicated that preparing and priming the chemotherapy IV set by the pharmacists protects them from being exposed to chemotherapy during these procedures.

To better track invisible chemotherapy exposure, participants underscored the importance of engineering controls by performing wipes testing for chemotherapy in common work areas, patient rooms, and break rooms frequently. Furthermore, participants indicated that all nurses should be screened for chemotherapy exposure health complications through self-report surveys as well as physical examinations and laboratory tests to early detect and treat any health complications associated with chemotherapy exposure. Regularly sharing aggregated summary of the results from these surveys and screening tests with

oncology nurses would increase their awareness on the occupational hazards associated with chemotherapy exposure.

Most participants acknowledged the effect of their peers on their adherence to chemotherapy handling guidelines. Therefore, health care organizations should enforce a culture of safety in which safety practices are encouraged and modeled by each member of the team. Moreover, nurse participants mentioned that nurses should be supported by the management, particularly when they experience exposure situations. Most importantly, the process of reporting an exposure incident should not be punitive but supportive to an oncology nurse even when the incident results from a human error.

DISCUSSION

The purpose of this research study was to describe the factors that affect chemotherapy exposure and strategies to foster chemotherapy safety among oncology nurses. By identifying these factors and strategies, interventions could be developed to foster chemotherapy safety among oncology nurses. This study is unique, as it elicited the perspective of oncology nurses and nurse managers on the factors and strategies that influence chemotherapy safety among oncology nurses.

In agreement with the Health Belief Model, the findings of this study reveal that personal health beliefs and workplace-related factors affect chemotherapy safety among oncology nurses by influencing their preventive health behaviors in terms of adherence to the safe handling guidlines.[12,13] Further, previous studies of quantitative designs show that there are significant relationships between nurses' adherence to chemotherapy handling guidelines and their health beliefs,[7] knowledge on chemotherapy exposure,[15] interpersonal influences, supportive work environments, workload,[16] and types of cues to action.[17]

The study results provide insights on the factors that shape nurses' personal health beliefs regarding chemotherapy exposure. These factors should be taken into consideration when developing interventions targeted to influence nurses' health beliefs regarding chemotherapy exposure. Knowledge is an important factor influencing an individual's health beliefs.[12,13] The findings of the current study indicate that some nurses perceive the likelihood of acquiring the health complications of chemotherapy exposure as low because most of the exposure incidents occur through skin and in trace amounts. Similarly, the findings of Boiano et al[18] show that the most important barrier to adhering to chemotherapy handling guidelines among nurses is underestimating the dangerous effects of minimal exposures. This underscores the importance of educating nurses and assessing their knowledge on chemotherapy exposure consistently to influence their health beliefs regarding chemotherapy exposure.

It is not surprising that workplace-related factors affect nurses' chemotherapy safety, as they have a direct influence on nurses' readiness to adhere to chemotherapy handling guidelines. Even when nurses have positive health beliefs regarding chemotherapy exposure, they would not be able to follow the safe handling guidelines if the work environment does not support safety practices by offering education, providing required equipment and

resources, and having clear policies and procedures to monitor adherence and support nurses' chemotherapy safety. On the other hand, workplace conditions and resources that support workers' safety influence workers' perception of a safety climate that reflects workplace management values and attitudes toward safety.[19] Workers' perception of a safety climate enhances their adherence to safety practice guidelines.[20]

With one of the 15 nurse participants in the current sample reporting being exposed to chemotherapy in the last 12 months, this equates to a 7% annual exposure rate among oncology nurses. Moreover, several participants believe that they have been exposed to chemotherapy indirectly. Also, they believe that indirect exposure is the reason behind several oncology nurses' experience of health complications associated with chemotherapy exposure despite their consistent adherence to handling guidelines. Evidence from the literature shows that indirect exposure is a significant source of chemotherapy exposure in oncology work settings.[21] Even more, chemotherapy contamination with several types of chemotherapy drugs predisposes health care workers to mixed occupational exposure, in which the combined effect of exposure to these drugs on health is more harmful that the effects of each drug separately.[22]

Participants in this study proposed several strategies to enhance oncology nurses' chemotherapy safety. In addition to these proposed strategies to prevent chemotherapy exposure among nurses, health care institutions should adopt policies, procedures, and strategies that promote nurses' health and safety in a way consistent with the National Institute for Occupational Safety and Health Total Worker Health® approach.[23] Based on this approach, efforts should not only be directed to prevent or minimize the hazards at work but also to promote the health and well-being of workers through focused and tailored programs to their health needs.[23,24]

LIMITATIONS

The limitations of this study include recall bias because nurse participant responses were based on previous events and experiences. Another limitation is recruiting a small sample of participants from 2 medical centers in the Midwest US, which limits the transferability of these research findings to other health care institutions in other regions. Moreover, the convenience sampling method was used, and most participants have homogeneous demographic characteristics; different findings could result from a larger and more heterogeneous sample.

Implications for Nursing

Based on the findings from this study, several personal and workplace factors affect oncology nurses' chemotherapy safety. Health care institutions should take these factors into account when developing strategies to foster oncology nurses' chemotherapy safety. Oncology nurses' health beliefs can be effectively shaped by regular education and training, facilitating access to reliable and up-to-date information, providing ongoing support, and using positive reinforcement strategies to encourage adherence. In addition, providing required equipment and resources, supporting a culture of safety, addressing the barriers to adhering to chemotherapy handling guidelines, and having clear policies and procedures

to support nurses' chemotherapy safety are important to enhance the occupational health of oncology nurses. Equally important, behaviors by health care workers and patients that lead to contaminating common areas with chemotherapy should be monitored and prevented. Also, oncology health care settings should implement frequent wipe testing of common areas and break rooms to assess for chemotherapy contamination.

Future research should be directed toward investigating interventions targeted to promote chemotherapy safety among oncology nurses. Further, research on methods for tracking and preventing indirect exposure to chemotherapy as well as methods for chemotherapy decontamination are warranted.

CONCLUSION

Oncology nurses who handle chemotherapy can experience the health effects of exposures to these hazardous drugs. Oncology nurses' health beliefs, cues to adhere to chemotherapy handling guidelines, and the indirect exposure to chemotherapy are important factors affecting nurses' chemotherapy safety. These factors should be considered when developing interventions to promote oncology nurses' occupational health and safety. Oncology nurses and nurse managers should be involved in designing strategies that promote nurses' chemotherapy safety. Oncology nurse managers have a significant role in advocating for nurses' chemotherapy safety at the department and institutional levels.

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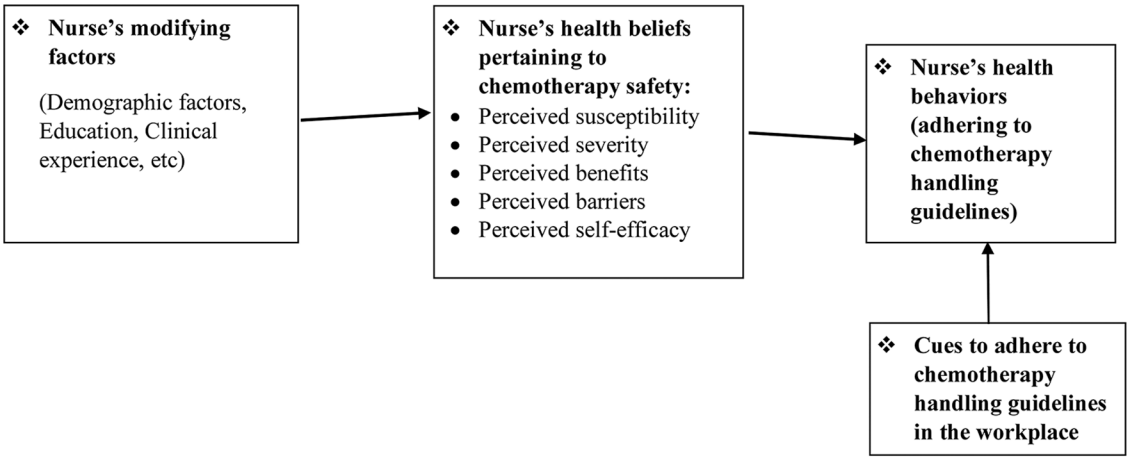

Figure 1.
The conceptual model of the study based on the Health Belief Model.

TABLE 1.

Participant Demographics (n = 20)

Variable	Category	Frequency	Percent	M	SD	Range
Age				38.2	10.8	24-63
Gender	Female	20	100%			
Race	White	19	95%			
	African American	1	5%			
Education	Associate degree	3	15%			
	Bachelor's degree	15	75%			
	Master's degree	2	10%			
Nursing clinical experience (years)				12.7	10.3	1-44
Oncology experience (years)				11.2	9.9	1-42
Exposure to chemotherapy in the past 12 months	Yes	1	5%			
	No	19	95%			

Abbreviations: M, mean; SD, standard deviation.