Oncology Nurses' Perceptions About Involving Patients in the Prevention of Chemotherapy Administration Errors

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Medication errors are among the most serious class of errors and may cause considerable harm. Although any drug is susceptible to errors, chemotherapy presents special dangers because many agents have a narrow therapeutic index and are toxic even at therapeutic dosages, chemotherapy regimens are highly complex, and patients with cancer are a vulnerable population with little tolerance (Muller, 2003). Adverse event studies have reported that errors in administration of chemotherapy occur frequently (Gandhi et al., 2005; Lustig, 2000). Walsh et al. (2009) observed an error rate of 8.2 per 1,000 medication orders among adult patients with cancer in the outpatient setting. Five medication errors per 1,000 orders had the potential to cause harm, and one error per 1,000 orders resulted in injury (Walsh et al., 2009). Common errors included under- and overdosing, schedule and timing errors, and other incidents, such as infusion rate errors. Analysis of the MEDMARX® database revealed that, of 310 pediatric chemotherapy errors reported, 85% reached patients and 16% required additional monitoring or intervention (Rinke, Shore, Morlock, Hicks, & Miller, 2007). Almost 50% of errors occurred in medication administration. The diffusion of oral and infusion chemotherapy to the outpatient setting introduces additional hazards. For example, parents have major difficulties in preparing, dispensing, and administering medication to their children (Taylor, Winter, Geyer, & Hawkins, 2006).

In addition to professional activities such as electronic prescribing and standardized ordering entry, involving patients in error prevention has been recommended widely by the Institute of Medicine (2000), the American Hospital Association, and oncology experts (Coulter, 2006; Kloth, 2002; Vincent & Coulter, 2002).

Purpose/Objectives: To explore oncology nurses' perceptions and experiences with patient involvement in chemotherapy error prevention.

Design: Qualitative descriptive study.

Setting: In- and outpatient oncology units of a community hospital in Switzerland.

Sample: 11 actively practicing oncology nurses working in an ambulatory infusion unit or on wards.

Methods: Oncology nurses participated in two focus groups on two occasions. Participants discussed their personal experiences with patients intervening to intercept errors, attitudes toward patient involvement in error prevention, and changes in relationships with patients. A content-analysis framework was applied to the transcripts and analytical categories were generated.

Main Research Variables: Perceptions about patient involvement in error prevention.

Findings: Participants shared affirmative attitudes and overwhelmingly reported positive experiences with engaging patients in safety behaviors, although engaging patients was described as a challenge. Nurses intuitively chose among a set of strategies and patterns of language to engage patients and switch between participative and authoritative models of education. Patient involvement in error prevention was perceived to be compatible with trustful relationships. Efforts to get patients involved have the potential for frustration if preventable errors reach patients. Considerable differences exist among organizational barriers encountered by nurses.

Conclusions: Nurses acknowledged the diverse needs of patients and deliberately used different strategies to involve patients in safety. Patient participation in safety is perceived as a complex learning process that requires cultural change.

Implications for Nursing: Oncology nurses perceive patient education in safety as a core element of their professional role and are receptive to advancing their expertise in this area.

Evidence from survey studies shows that patients frequently observe, report, and intercept errors (Fränneby, Sandblom, Nyren, Nordin, & Gunnarsson, 2008; Schwappach, 2008; Weingart et al., 2005, 2007; Weissman et al., 2008). For example, patients recognize—often by accident—that incorrect drugs or incorrect doses of the correct drug are being given or that devices such as infusion pumps have malfunctioned (Muller, 2003; Schulmeister, 1999). As patients are the only individuals present during every treatment and consultation, they are a valuable resource for safe and effective cancer treatment systems. As described by Unruh and Pratt (2006), patients with cancer with recurring episodes of care commonly identify errors by checking concordance of prior experiences and information that is obtained randomly more or less to formulate rules and check reality against these rules.

A central and crucial element for patients' ability and effectiveness to participate in error identification is information. However, available data also suggest that information provision, recognition, and possibly interception of medication errors occur largely at random. The observation that patients frequently engage in their own safety but commonly face suboptimal conditions to be effective in doing so has led to considerations to systematically support and strengthen patients' awareness and use their potential in approaching errors. Several organizations now provide educational materials that motivate patients to engage in safety. For example, the Speak Up initiatives of the Joint Commission present several advisories that include instructions on how to participate in prevention of medication errors. The instructions recommend, "If you are given an IV, ask the nurse how long it should take for the liquid to run out. Tell the nurse if it doesn't seem to be dripping right" (Joint Commission, 2008, p. 2). Some U.S. cancer centers now provide patients with a card listing their medications, which patients can update as they receive treatment at different sites (Finkelstein, 2006). Patients' continuous self-reporting of toxicity symptoms during chemotherapy has been described as a successful approach that is well accepted by patients (Basch et al., 2005, 2007).

Oncology nurses play a central and challenging role in engaging patients in safety. Nurses are confronted with informing and instructing patients, building a trustful environment in which patients feel welcomed to speak up, positioning patients' engagement in safety in the context of professional responsibility, responding adequately to patients' engagement, and dealing with difficult situations after errors occur. However, evidence is lacking on clinicians' perspectives toward active engagement of patients in safety, despite the proliferation of patient involvement initiatives. As a result, the current study aims to explore clinical oncology nurses' attitudes and experiences toward patients' roles in the prevention of chemotherapy administration errors.

Methods

Design

This descriptive study used focus group discussions with oncology nurses to explore their perceptions and experiences with patient involvement in error prevention. The authors chose the focus group method to access the collective concepts held by nurses and to benefit from discussion among participants. The authors anticipated that oncology nurses would have important and valuable knowledge and experiences, but that information would not necessarily be readily accessible because of unfamiliarity with the current study's questions. The authors expected that focus group participation would intensify oncology nurses' observations and interpretations of their reality and clinical practice. To gain insight into these experiences, the focus groups were repeated with the same participants 10 weeks after the initial meetings. Therefore, each nurse participated in two focus group meetings at two points in time.

The current study took place in a large community hospital in Switzerland. This hospital serves a population of about 500,000 inhabitants from rural and urban areas in Switzerland. Chemotherapy is provided in a large outpatient ambulatory infusion unit and on inpatient wards of several departments (e.g., internal medicine, surgery). The organizational characteristics differ significantly between the two modes of care. For example, ambulatory infusion unit nurses are highly specialized and work in continuous small teams, whereas ward nurses encounter a large variety of tasks and staff assignments can fluctuate. Nurses providing care in either setting were approached. The authors obtained ethical approval from the local ethics committee as part of a larger study on patient involvement in chemotherapy error prevention.

Participants

Nurses working on wards or in the ambulatory infusion unit with personal experience in chemotherapy administration were recruited for participation in the focus groups. Two nursing experts approached candidates and provided verbal and written information on the study. Nurses who agreed to participate signed an informed consent form and provided information on years of nursing experience. Ward nurses and ambulatory infusion unit nurses participated in distinct groups because the authors expected them to share systematically different experiences. Two focus group sessions were conducted for each group.

Data Collection and Analysis

The researchers developed two question sets for the first and second meetings, respectively (see Figure 1). Main themes discussed in the initial sessions were personal

experiences with patients intervening to intercept errors in chemotherapy administration, attitudes toward patients' active involvement, risks and barriers, and nurses' potential role in engaging patients in safety. At the end of the first session, participants were invited to actively monitor patients' work in ensuring safe care and any changes in their own behavior. In the second session, the main themes discussed were observations and experiences, anticipated or perceived changes in relationships with patients, responses to failures in empowering patients to participate in error prevention, and concrete interventions to engage patients in safety. Focus groups were led by one of the authors, a trained moderator with a strong background in patient safety management. Each focus group session lasted 90–120 minutes. The sessions were recorded digitally and transcribed verbatim. All transcripts were verified by one researcher prior to data analysis.

An inductive theme-identification content-analysis framework was applied to the transcripts (Graneheim & Lundman, 2004; Hsieh & Shannon, 2005; Mayring, 2000; Sandelowski, 2000). After the transcripts were read several times, texts were divided into units of meaning (words, sentences, or paragraphs), which then were coded, grouped, and condensed into categories (Elo & Kyngas, 2008). Emergent themes and recurring ideas were identified and classified in terms of con-

cepts. Categories were abstracted as far as possible by grouping subcategories as categories and categories as themes (Graneheim & Lundman, 2004). To provide triangulation, two researchers independently analyzed the transcripts in an iterative process. Areas of disagreement were discussed and feedback-loops were used to ensure validity (Vaughn, Shay Schumm, & Sinagub, 1996). New codes were added as additional themes emerged from the second sessions, and some codes were eliminated. The finalized code structure then was applied to all transcripts by both researchers (Bradley, Curry, & Devers, 2007; Sandelowski, 2000). Data were organized into themes and comparisons were made within and between the two groups. Representative quotes were selected. Finally, results and interpretations were presented and discussed in a meeting with focus groups participants (i.e., member checking) (Murphy & Dingwall, 2003).

Results

Eleven oncology nurses (six working on wards and five from the ambulatory infusion unit) participated in the focus groups. Participants reported 6–40 years of practice with a mean of 16.8 years ($\overline{X}$ years on wards = 15.5; $\overline{X}$ years on ambulatory unit = 18.4). Ten nurses were women. During the two sessions, four major themes related to patient involvement in error prevention were identified: involving patients; challenges, strains, and barriers; responsibility for safety; and learning and reflecting on patient involvement.

Involving Patients

Participants reported several occurrences of patients who detected and intercepted errors. Errors included omitted drugs and doses (missing pre- and comedications in particular), lack of information (e.g., regarding oral care), deviations from treatment plans, and incorrect infusion rates. The errors often occurred because of communication failures between doctors and nurses.

[The patient and physician] then discuss adjustments to therapy, because, to mitigate side effects, for example . . . but this information is often not transmitted from doctors to [nurses] in due time before we get the patient from the waiting area to the infusion unit. . . . Patients correct drug preparations like, "The doctor said I should get a second tablet."

In general, nurses had strong positive attitudes toward patients who intervened to intercept errors and toward supporting patients' engagement in safety. Activating patients was described as a challenge. Participants welcomed any patient activities that would help to prevent errors and increase safety. A common experience was

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First Focus Group Session
- Did you ever experience a patient who noticed an error or close call in chemotherapy administration? What happened and how did the patient intervene?
- How did you feel, or would you feel, if a patient pointed you to an error or intervened to intercept error?
- Do you fear that a patient will detect an error in the care you provide?
- Can patients contribute to identifying or preventing errors?
- How do you see your personal role—if at all—in involving patients in safety and error prevention?
- What problems or risks may be associated with involving patients?
- Do you see potential for conflict between nurses and patients with increased vigilance of patients?

Second Focus Group Session
- Since the last meeting, did you experience patients who detected or prevented errors?
- Since the last meeting, has anything changed for you in how you communicate with your patients and involve them in their care?
- Today, how is your perspective toward actively involving patients in error prevention?
- Do you think you can make a difference in empowering patients?
- If you motivate patients to look for any errors or deviations from routines and to speak up, how do you think this would affect trust between you and your patients?
- What kind of interventions would be useful to help you to engage patients in error prevention?

Figure 1. Focus Group Protocol

discussing safety issues; patients accepted their role in detecting and preventing errors, which strengthened nurses' relationship with patients rather than undermining it.

> Patients perceive it as strength if we say, "We give our best that everything is correct and ideal, but if you observe . . . inconsistencies or discrepancies, then please speak up." . . . That's rather a strength.

> They are already informed that errors do occur, through the media, the Internet . . . they know that things can go wrong. Talking about it, it increases trust.

Despite a general commitment toward involvement of patients in both groups at both sessions, the diversity of patients receiving chemotherapy was discussed as an important aspect of patient involvement. Participants argued that willingness, abilities, and resources vary considerably among and within patients in the course of treatment. Although "diversity of patients" was used as a diffuse descriptor in the first focus group session, nurses in both groups proactively identified distinct groups of patients at the second meeting. Nurses were aware of the different capabilities patients have and reported diverse strategies to use various roles at different stages of the treatment process. A participant said, "If you strike the right note . . . I'm consistently amazed how well they perform!"

One participant from the ambulatory unit noted that even patients who seem unmotivated should be encouraged. Participants strongly agreed that most patients would engage in safety if they were informed that "this is being expected from them," but several nurses said that the underlying motivation would differ between patient groups. Although younger patients would appreciate being involved in their care and being taken seriously, older patients in particular would follow nurses' instructions mainly because of nurses' authoritative character. Others would act to oblige nurses. Clearly, nurses used different concepts and languages to engage different patients.

> I ask them for their help . . . that they support me in my work. For example, "It would help me a lot if you could also watch out that everything is correct." I mandate them to read the labels with me. I mandate them to report anything they feel is not okay. I use this term "mandate," and I feel that is something they can understand and accept.

> Elderly patients are sometimes concerned if you use the terms "error" or "safety." It is better to frame "safety" as "quality." Something like, "Let's work together to ensure the quality of your care."

One nurse emphasized the learning process of patients and that nurses should activate and assist patients by asking questions, using teach-back methods, eliciting patients' observations, and observing a sense of success.

> It also needs positive feedback. [Patients] have to make the experience that if they ask questions, if they observe something, even if it turns out that everything is okay, that this is good, and that we welcome that. And that our response is constructive.

One participant said that patients' contributions would be important feedback for consolidating safety management within the team and identifying unsafe practices. Ambulatory infusion unit nurses noted that continuous, joint, and honest efforts are needed to engage patients in safety. Participants said,

> To educate [patients] one time, that's not enough. It's a continuous process, and needs a culture . . . and it has to start at the consultation with doctors. Doctors need to get patients involved, because . . . if they do not, it will hardly be possible for us to motivate patients. Doctors need to signal that there is room for questioning staff, that this is wanted and acknowledged.

> It needs a culture. [Patients] have to experience that this is not just a flowery phase. That it is honest . . . we live it that way.

Challenges, Strains, and Barriers

Although nurses in general shared positive attitudes about engaging patients, participants also acknowledged that involvement of patients has the potential for frustration if patients fail to communicate adverse events or errors quickly even though they have received intensive education.

> There is a certain feeling of helplessness . . . disappointment. We could have prevented [the error] from reaching the patient if she only had said something. You explain it all over again, and keep asking, "Please, please, do not hesitate to call us, just in case . . ." and she just won't do it. There is nothing left then, and that's disappointing. What a shame.

Nurses also described two strong emotional responses to patients who noticed an error in their care: a moment of shock that an error occurred at all and relief and gratefulness if the error was detected prior to reaching the patient. Participants agreed that the occurrence of an error was distressing, not that a patient detected it. However, some participants reported instances in which their trust in nurses was lost after noticing an error. The involved nurses recognized that patients' trust was deeply eroded.

> It's just that I felt that she did not trust me anymore. She was uncomfortable with me and full of doubt. She didn't say anything though, but I felt she was

uneasy having me preparing her drugs. I asked her whether she would prefer that somebody else would take care of her. She acknowledged that and so that's what we did.

Nurses felt that these situations were challenging and sometimes difficult to manage, but support from other team members and professional development were perceived to be helpful.

Ward nurses identified several barriers to involving patients, including general time constraints and organizational processes that prevent them from educating patients (e.g., high degree of fluctuation within teams, few continuous relationships with patients, little awareness of doctors ordering chemotherapies). Nurses also recognized that variability in procedures and administration techniques often irritate patients, lead to false alarms, and, therefore, may decrease patient's engagement as "patients cannot identify patterns of routines."

It's somewhat misleading to teach [patients] to speak up in case something goes different from the standard if the standard changes every time they get chemo. . . . I then say, "You know, we all make it slightly different, but this is okay, no need to worry for you, it's all slightly different, but essentially the same." They are sometimes alarmed if something differs from their last chemo, but this is not error in what we do.

Some also felt that they had little support and expertise in engaging patients.

If [patients] start chemotherapy in the evening, this is just stress for us. There is simply no time to get patients informed.

How can I teach patients about side effects to monitor if I, myself, am only cursorily informed? There are so many different regimes.

Participants from the ambulatory infusion unit noted that their emotional response to errors detected by patients also would be influenced by the general safety culture and their connection to doctors. Some nurses felt that doctors used information about errors detected by patients to degrade nurses.

Responsibility for Safety

Nurses had clear ideas of responsibility for ensuring a safe treatment process. Participants strongly agreed that safety in chemotherapy administration was nurses' responsibility and that involving patients does not discharge nurses from liability; rather, patients' vigilance was perceived as a complementary "last hurdle." Nurses involved in outpatient treatment discussed how they ensured education in safety prior to placing responsibility on patients.

As long as [patients] are here, it's clearly our . . . duty to ensure safe chemo. It is also our responsibility to ensure that they are aware of all safety concerns. . . . We then have to . . . test, whether they got it, whether they are well prepared. I let them explain to me all the issues. And yes, when we are really sure that it is okay . . . we give back a part of responsibility to them when they go home. Then, they have to carry a part of it. We call them the next day . . . let them explain how they took their drugs . . . and again, we give a little more responsibility to them. It's always like the same process: educate, check back, feedback, and pass back another small "packet" of responsibility.

Learning and Reflecting on Patient Involvement

Of note, participants in the second sessions reported considerable efforts in patient involvement after the first session, even though the efforts were not requested. Many reported changes in practice, increased sensitivity in communicating with and motivating patients, attentiveness in monitoring patients' behaviors, and reflections on their own and patients' needs. For example, one ward nurse learned at the first meeting about the ambulatory infusion unit's practice of controlling and reading IV bag labels together with patients. The nurse reported,

That impressed me. I tried to transfer that to my setting. It doesn't work with all patients, though. Younger patients are receptive and interested. I did not experience any rejection. It also gives *me* more safety, I recognize. I'm now checking all details on the bags with patients, like their names. . . . I also instructed the trainee on the ward to do so.

Since our last meeting, I reflect more on, "Did I really reach the patient? How can I ensure he understood?" I'm implementing more checks to validate whether I informed them in ways they can understand.

I used to check treatment plans together with patients earlier, but that got lost in daily routine. I changed back to that practice [after the last meeting]. I . . . now explain more intensively again. I . . . use the original treatment plan and prescription documents now.

Ward nurses also perceived intervening patients as a positive confirmation of their successful communication of information. Nurses regarded the proactivity of patients as a direct positive outcome of their efforts.

Comments from the second session showed that ward nurses changed their practice as individuals without being supported by colleagues or supervisors, whereas ambulatory infusion unit nurses seemed to have a more common understanding and awareness of emerging

areas of unsafe practices in patient involvement. For example, participants reported to have extended their practice of providing written information to patients with IV medications to those with oral chemotherapy.

> I think, with oral chemo, we have no optimal solution for patients available yet. It seems to me that these patients need something special. . . . I'm now providing patients a treatment sheet that includes which pills to take, when to take them, and how. I'm not sure how well this works yet.

All nurses reported positive feedback from patients and their families and felt respected for their efforts. Many factors that counteract patient involvement also were observed in the two meetings and reflected on at the second session. Factors included involvement of foreign-language patients, involvement of relatives, and contradictory information provided to patients by nurses and doctors.

Discussion

The current study assessed oncology nurses' perceptions and experiences with involving patients in the prevention of chemotherapy administration errors. Participants shared affirmative attitudes and mostly reported positive experiences with engaging patients in safety behaviors, but they acknowledged that activating patients is a challenge. The authors observed considerable differences in the environmental factors nurses encounter according to mode of chemotherapy care (wards versus ambulatory infusion unit). Ward nurses perceived strong organizational barriers (e.g., time constraints, team fluctuation) and felt unprepared to involve patients in chemotherapy safety.

Participants from both care settings reported that they did not experience or expect nurses' activities to engage patients or patients' interception of errors to erode trust. Entwistle and Quick (2006) concluded from their conceptual analysis that patient participation in safety is compatible in principle with trust in providers if trust is viewed as a bidirectional characteristic of a partnership rather than a unidirectional attribute of a dependent relationship. Participants' experiences in the current study generally confirm Entwistle and Quick's (2006) analysis and also point to individual occurrences in which patients' trust were severely eroded after detecting an error. Encouragingly, nurses seemed well aware of even subtle changes in patients' trust and succeeded in responding accurately to such occurrences, although their actions were not supported by organizational policies. However, active involvement of patients in safety requires cultural and organizational change in healthcare institutions to be successful. For example, chemotherapy administration procedures should be standardized to allow patients to detect deviations

from routines, and clinicians need practical support in encouraging patients by responding adequately to patients that intervene, positioning patients' engagement within providers' responsibility for safety, and maintaining trustful relationships. Nurses identified several organizational barriers to successful engagement of patients in safety and acknowledged that patients' detection of errors may complicate relationships with physicians or be misused to blame nurses. In addition, participants acknowledged that increased efforts to involve patients may cause frustration if errors that are perceived as preventable reach patients. Focus groups revealed that nurses felt little support to handle such situations.

The results suggest that patient participation in safety is perceived as a complex learning process in which nurses adopt strategies to provide education according to patients' states of health and stages of treatment. Although the authors did not assess nurses' communication with patients directly, participants' reports suggest that nurses intuitively choose among a set of differentiated strategies, role models, and patterns of language toward different groups of patients. Nurses seem to switch between participative and authoritative models of education relative to their perception of individual patients' capabilities and personality traits. The finding reflects preliminary evidence on patients' willingness to engage in safety (Schwappach, 2009). In a survey study of patients undergoing surgery, patients were more likely to ask staff challenging safety-related questions if they were instructed to do so (Davis, Koutantji, & Vincent, 2008), indicating that the same perception of medical authority that prevents patients from performing challenging behaviors can be helpful in instructing patients to execute the behaviors. However, whether the changes in intention are caused by altering patients' perceived subjective norms (e.g., "It is welcomed by staff that patients participate and question staff.") or simply by embedding unfamiliar behavior within the same expectations attributed to authorities (e.g., "Nurses expect that behavior from patients.") is unclear.

Empiric research confirms the framework of theory of planned behavior and suggests that self-efficacy, behavioral control beliefs, the preventability of incidents by patients, and the perceived effectiveness of actions seem to be central for patients' intentions to engage in their safety and subsequent behavior (Hibbard, Peters, Slovic, & Tusler, 2005; Luszczynska & Gunson, 2007; Peters, Slovic, Hibbard, & Tusler, 2006). Therefore, oncology nurses should attempt to approach these elements by presenting examples of patients who engage in their own safety effectively or by detailing the preventability of errors. Surprisingly, the initial focus group session appeared to have had interventional character. Many participants changed their practice—

at least temporarily—and experimented with actions to get patients involved. The finding strongly suggests that oncology nurses perceive patient education in safety as a core but challenging element of their professional role and are receptive to advancing their expertise in this area.

Limitations

The main limitation of the current study is that nurses were sampled from only one hospital and the results should be interpreted in this context. Therefore, the generalizability of results to other settings of care is questionable. However, the authors explicitly addressed diversity of mode of chemotherapy administration within the same institution.

Conclusion

Oncology nurses supported patients' involvement in error prevention and mainly reported positive experiences. Nurses acknowledged the diverse needs of patients at different stages of chemotherapy and deliberately used different strategies to involve patients in their own safety. However, nurses faced several organizational and cultural barriers, particularly when chemotherapy administration was provided in a setting with diverse tasks, fluctuant team organization, and little structural professional support. In addition, the authors did not find any indications in the context of this study that patients' involvement in safety conveys the shifting of responsibility of safety toward patients.

References

Basch, E., Artz, D., Dulko, D., Scher, K., Sabbatini, P., Hensley, M., . . . Schrag, D. (2005). Patient online self-reporting of toxicity symptoms during chemotherapy. *Journal of Clinical Oncology, 23,* 3552–3561. doi: 10.1200/JCO.2005.04.275

Basch, E., Artz, D., Iasonos, A., Speakman, J., Shannon, K., Lin, K., . . . Schrag, D. (2007). Evaluation of an online platform for cancer patient self-reporting of chemotherapy toxicities. *Journal of the American Medical Informatics Association, 14,* 264–268. doi: 10.1197/jamia.M2177

Bradley, E.H., Curry, L.A., & Devers, K.J. (2007). Qualitative data analysis for health services research: Developing taxonomy, themes, and theory. *Health Services Research, 42,* 1758–1772. doi: 10.1111/j.1475-6773.2006.00684.x

Coulter, A. (2006). Patient safety: What role can patients play? *Health Expectations, 9,* 205–206. doi:10.1111/j.1369-7625.2006.00405.x

Davis, R.E., Koutantji, M., & Vincent, C.A. (2008). How willing are patients to question healthcare staff on issues related to the quality and safety of their healthcare? An exploratory study. *Quality and Safety in Health Care, 17,* 90–96. doi: 10.1136/qshc.2007.023754

Elo, S., & Kyngas, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62,* 107–115. doi: 10.1111/j.1365-2648.2007.04569.x

Entwistle, V.A. & Quick, O. (2006). Trust in the context of patient safety problems. *Journal of Health Organization and Management, 20,* 397–416. doi: 10.1108/14777260610701786

Finkelstein, J.B. (2006). E-prescribing first step to improved safety. *Journal of the National Cancer Institute, 98,* 1763–1765.

Fränneby, U., Sandblom, G., Nyren, O., Nordin, P., & Gunnarsson, U. (2008). Self-reported adverse events after groin hernia repair: A study based on a national register. *Value in Health, 11,* 927–932. doi: 10.1111/j.1524-4733.2008.00330.x

Gandhi, T.K., Bartel, S.B., Shulman, L.N., Verrier, D., Burdick, E., Cleary, A., . . . Bates, D.W. (2005). Medication safety in the ambulatory chemotherapy setting. *Cancer, 104,* 2477–2483. doi: 10.1002/cncr.21442

Graneheim, U.H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures, and measures to achieve trustworthiness. *Nursing Education Today, 24,* 105–112. doi: 10.1016/j.nedt.2003.10.001

Hibbard, J.H., Peters, E., Slovic, P., & Tusler, M. (2005). Can patients be part of the solution? Views on their role in preventing medical errors. *Medical Care Research and Review, 62,* 601–616. doi: 10.1177/1077558705279313

Hsieh, H.F., & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research, 15,* 1277–1288. doi: 10.1177/1049732305276687

Institute of Medicine. (2000). *To err is human. Building a safer health system.* Washington, DC: National Academy Press.

Joint Commission. (2008). Speak up initiatives. Retrieved from http://www.jointcommission.org/PatientSafety/SpeakUp

Kloth, D.D. (2002). Prevention of chemotherapy medication errors. *Journal of Pharmacy Practice, 15,* 17–31. doi: 10.1106/EXK5-5F5M-T5QV-45CW

Lustig, A. (2000). Medication error prevention by pharmacists—An Israeli solution. *Pharmacy World and Science, 22,* 21–25. doi: 10.1023/A:1008774206261

Luszczynska, A., & Gunson, K.S. (2007). Predictors of asking medical personnel about handwashing: The moderating role of patients' age and MRSA infection status. *Patient Education and Counseling, 68,* 79–85. doi: 10.1016/j.pec.2007.05.008

Mayring, P. (2000). Qualitative content analysis. Retrieved from http://www.qualitative-research.net/fqs-texte/2-00/2-00mayring-e.htm

Muller, T. (2003). Typical medication errors in oncology: Analysis and prevention strategies. *Onkologie, 26,* 539–544. doi: 10.1159/000074148

Murphy, E., & Dingwall, R. (2003). *Qualitative methods and health policy research.* New York, NY: Walter de Gruyter.

Peters, E., Slovic, P., Hibbard, J.H., & Tusler, M. (2006). Why

worry? Worry, risk perceptions, and willingness to act to reduce medical errors. *Health Psychology, 25,* 144–152. doi: 10.1037/0278-6133.25.2.144

Rinke, M.L., Shore, A.D., Morlock, L., Hicks, R.W., & Miller, M.R. (2007). Characteristics of pediatric chemotherapy medication errors in a national error reporting database. *Cancer, 110,* 186–195. doi: 10.1002/cncr.22742

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing and Health, 23,* 334–340.

Schulmeister, L. (1999). Chemotherapy medication errors: Descriptions, severity, and contributing factors. *Oncology Nursing Forum, 26,* 1033–1042.

Schwappach, D.L. (2008). "Against the silence": Development and first results of a patient survey to assess experiences of safety-related events in hospital. *BioMed Central Health Services Research, 8,* 59. doi: 10.1186/1472-6963-8-59

Schwappach, D.L. (2009). Engaging patients as vigilant partners in safety: A systematic review. Retrieved from http://mcr.sagepub.com/cgi/rapidpdf/1077558709342254v2

Taylor, J.A., Winter, L., Geyer, L.J., & Hawkins, D.S. (2006). Oral outpatient chemotherapy medication errors in children with acute lymphoblastic leukemia. *Cancer, 107,* 1400–1406. doi: 10.1002/cncr.22131

Unruh, K.T., & Pratt, W. (2006). Patients as actors: The patient's role in detecting, preventing, and recovering from medical errors. *Inter-national Journal of Medical Informatics, 76*(1, Suppl.), S234–S244. doi: 10.1016/j.ijmedinf.2006.05.021

Vaughn, S., Shay Schumm, J., & Sinagub, J. (1996). *Focus group interviews in education and psychology.* Thousand Oaks, CA: Sage.

Vincent, C.A., & Coulter, A. (2002). Patient safety: What about the patient? *Quality and Safety in Health Care, 11,* 76–80. doi: 10.1136/qhc.11.1.76

Walsh, K.E., Dodd, K.S., Seetharaman, K., Roblin, D.W., Herrinton, L.J., Von Worley, A. . . . Gurwitz, J.H. (2009). Medication errors among adults and children with cancer in the outpatient setting. *Journal of Clinical Oncology, 27,* 891–896. doi: 10.1200/JCO.2008.18.6072

Weingart, S.N., Pagovich, O., Sands, D.Z., Li, J.M., Aronson, M.D., Davis, R.B., . . . Phillips, R.S. (2005). What can hospitalized patients tell us about adverse events? Learning from patient-reported incidents. *Journal of General Internal Medicine, 20,* 830–836. doi: 10.1111/j.1525-1497.2005.0180.x

Weingart, S.N., Price, J., Duncombe, D., Connor, M., Sommer, K., Conley, K.A., . . . Ponte, R.R. (2007). Patient-reported safety and quality of care in outpatient oncology. *Joint Commission Journal on Quality and Patient Safety, 33,* 83–94.

Weissman, J.S., Schneider, E.C., Weingart, S.N., Epstein, A.M., David-Kasdan, J., Feibelmann, S., . . . Gatsonis, C. (2008). Comparing patient-reported hospital adverse events with medical record review: Do patients know something that hospitals do not? *Annals of Internal Medicine, 149,* 100–108.