STUDENT NURSES' EXPECTATIONS OF SERVICE QUALITY VERSUS ACTUAL EXPERIENCES OF A SIMULATION AT A HIGHER EDUCATION INSTITUTION

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ABSTRACT

Simulations may assist students to deal with differences in focus between what they learn in the classroom with what is expected in the clinical practice situation – more specifically the needs of the patient. In addition, simulations assist students to become active participants in their own learning and use their knowledge when thinking and applying what they have learned in a healthcare setting. The aim of the study was to determine the relationship between nursing students' expectations regarding the quality of simulated training and their actual evaluation of the experience of such simulations. Using convenience sampling, a total of 30 student nurses completed two questionnaires that measured their expectations regarding service quality (SERVQUAL) and their actual satisfaction with the simulation. Both questionnaires had acceptable levels of reliability,

except for the responsiveness and assurance dimensions of the SERVQUAL instrument. Student nurses reported high expectations related to the following aspects of service: assurance, reliability and tangibles. In addition, the majority of these expectations, except for assurance, had substantial correlations (r>0.4) with numerous dimensions associated with the actual experience of simulated training. In essence, 27 (90%) student nurses reported that they were very satisfied that the simulated training had met their expectations, and that the School of Nursing had the necessary capacity to host such simulations. Moreover, 27 (90%) students also viewed the simulations as being helpful to stimulate critical thinking. Finally, 24 students (79%) were of the opinion that simulations helped them to effectively communicate as a team.

Keywords: empathy, reliability, responsiveness, service quality, simulation, tangibles

INTRODUCTION AND BACKGROUND INFORMATION

Traditionally, nursing education has focused on an apprenticeship model of healthcare. Such an apprenticeship usually took place within a healthcare setting that facilitated in-service learning. However, the current training model integrates practical exposure with classroom learning at universities or colleges (Berragan, 2013). Hence, there are two systems that may be used to train nurses – in-service and classroom training. Both these systems have different aims and purposes. It seems as if simulations may be one of the better approaches to nursing education that may assist students to understand and appreciate both systems and settings. Student nurses engage the simulation as well as the patient and begin to 'respond, behave, and feel' like nurses (Berragan, 2013:251). This emotional component is one of the key areas of education in nursing when using simulations (Cant & Cooper, 2010). Previous researchers (Bradley & Bleakley, 2006) are of the opinion that simulation-based learning allows for the integration of classroom-learning with work-based learning. In addition, students are able not just to apply their knowledge, but also to understand, learn, and apply appropriate cultural practices relevant to the healthcare setting (Bradley & Bleakly, 2006). Hence, the application of theory is first simulated and practised before student nurses apply it in a healthcare setting.

Simulations are useful when they can support the following key areas of education in nursing (Cant & Cooper, 2010): 1) developing technical skills through the practice of psychomotor skills and repetition, 2) assistance provided by experts to address students' needs, 3) contextualised learning, and 4) incorporating the emotional component of learning. In essence, simulations allow students to integrate their knowledge with their clinical skills together with their understanding of effective multidisciplinary communication to successfully navigate real-time clinical situations requiring critical thinking (Prion, 2008).

Types of simulations

Simulations can range from low to high fidelity depending on the degree of similarity with the real working environment (Cant & Cooper, 2010). According to Alinier (2007:e243), there are six different types of simulations: 1) written simulations, 2) three-dimensional models, 3) multimedia simulators, 4) standardised patients, 5) intermediate-fidelity patient simulators, and 6) interactive patient simulators. According to Prion (2008:e69), student nurses can also role-play various scenarios fulfilling specific role requirements.

Benefits of simulations

It has been found that students who are trained using simulations have higher levels of satisfaction that may positively impact learning (Alinier, Hunt, Gordon & Harwood, 2006; Cant & Cooper, 2010). However, without proper debriefing, students may experience the simulation as intimidating, leading to feelings of anxiety that may eventually negatively impact the overall learning experience (Cant & Cooper, 2010; Jeffries & Rizzolo, 2006).

The following benefits are also highlighted by Haluck, Satava, Fried et al (2007:1224–1225). Student nurses are able to learn more by doing, hence there will be enhanced information transfer when using simulations. When students are given the opportunity to practise their clinical skills during a simulation, they become more proficient, which enables them to perform better as nurses. Simulations require student nurses to think critically and analyse the information presented in the simulation. Although the initial costs of setting up a simulation centre may be high, simulators become more cost effective when the instructor starts to decide which simulations and aids are needed to best assist with the training of nursing students.

Models to evaluate the effectiveness of simulations in Nursing Education

In order for universities or colleges to reap the benefits associated with simulated learning, it is important to have a model that can be used to design and measure simulations for nursing education (Prion, 2008). Two models will be discussed: 1) the Input-Environment-Outcome (I-E-O) model of Astin (1991), and 2) the five component model proposed by Jeffries (2005).

The I-E-O model suggests that those wanting to design and measure the impact of simulations for nursing education need to focus on three variables. Firstly, there are input variables that emphasise the student nurse. Examples of such variables include previous academic performance, previous exposure to healthcare settings, previous exposure to simulations, and knowledge of nursing practice and theory. In

addition, current levels of self-confidence may also be relevant (Prion, 2008:e72). Secondly, environmental variables emphasise the role played by instructors and the training they have received to conduct and facilitate simulations. It also includes the equipment used during the simulations as well as the fidelity and quality of the simulation (Prion, 2008:e72). The third set of variables in the I-E-O model suggests the need to focus on the outcomes of the simulation. More specifically, student learning outcomes that could be included are student nurses' levels of knowledge and understanding after they have participated in the simulation, their ability to apply critical thinking during the simulations, and the degree to which their self-confidence has increased after completing the simulation (Prion, 2008:e72).

Jeffries (2005) proposes a model, consisting of five dimensions, including teacher factors, student factors, educational practices, simulation design, and outcomes that can be applied to all types of simulations. At the most basic level, the model suggests that the outcomes to be achieved through simulations can only be achieved through both high quality educational practices as well as adhering to the basic principles of designing simulations. It is important to note that best practices, related to educational practices, depend on the quality of interaction between the student nurses and their instructors. The quality of such interactions is influenced by a clear definition of the roles played by students and instructors and their expectations of one another and the simulation.

In traditional classroom-based learning, emphasis is placed on the instructions of the instructor. In contrast, during simulations, instruction is student-centred. Hence, instructors are required to adapt their roles when using simulations. Instructors need to be able to provide appropriate instructions to the student nurses before the simulation as well as be able to deal with debriefing after the completion of the simulation. In addition, instructors need to be able to assist with the design of the simulations, use appropriate technology and equipment to enhance the fidelity of the simulation (Jeffries, 2005:e98). Student nurses who participate in simulations need to be highly motivated and self-directed to benefit from such experiences. In addition to these two student factors, it is also important to ensure that students actively participate during the simulation, processing relevant information, and apply it correctly (Jeffries, 2005:e98).

Educational practices (Jeffries, 2005:98–100) that may enhance the integration of student and facilitator factors include the active participation of students in the simulation as well receiving feedback from the instructor or peers regarding their performance. Simulations are helpful to facilitate collaborative learning where student nurses are required to work as part of a team to successfully complete the simulation. Such collaborative learning may assist in accommodating different learning styles that students feel comfortable with (Jeffries, 2005). Finally, students can learn how to manage their time when dealing with a challenging simulation. The more time they spend on certain tasks during the simulation, the less time they have

to complete others. Simulations allow students to learn from such mistakes and take corrective steps during another simulation (Jeffries, 2005).

In order for simulations to be designed correctly (Jeffries, 2005:e100-e101), the following aspects need to be attended to: firstly, objectives need to be clarified that will enhance the student nurses' knowledge and experience of a particular procedure. To support such objectives, it is important to have a plan to implement the simulation. The third and fourth aspects that need to be considered during the design of a simulation are the degree of fidelity and complexity of the simulation (Jeffries, 2005:e100–e101). Depending on the degree of information provided by the simulation, it can be classified as either less complex or more complex. The fifth, and final aspect, relates to debriefing (Jeffries, 2005:101).

The final dimension of the model suggested by Jeffries (2005) focuses on the outcomes to be achieved by student nurses after they have participated in a simulation. The outcomes are similar to those suggested by Prion (2008).

The need to evaluate service quality

Although both the previous models highlight important components for the design and evaluation of simulations, Haluck, Satava, Fried et al (2007:1228) are of the opinion that the financial considerations to start and maintain the simulation must also be part of such evaluations. More specifically, they advocate the need for the unit responsible for the delivery of the simulations to consider the following questions: 1) Who is the customer? 2) What is the most appropriate way to accomplish the service? 3) What resources are available to provide the service? and 4) How is the quality of the product ensured? These authors therefore seem to suggest the inclusion of some or other metric that can be used to determine the quality of the service delivered by the unit, in order for it to be financially viable.

STATEMENT OF THE RESEARCH PROBLEM

Given the high costs associated with simulated learning (Haluck, Satava, Fried et al, 2007), it is crucial to understand those factors that may influence its effectiveness. Integrating service quality into the models of both Astin (1991) and Jeffries (2005) may assist the unit that delivers the simulation training to: 1) measure the student nurses' (the customers) expectations and the unit's performance on several dimensions of service quality, 2) compare student nurses' expectations with actual performance to identify strengths and weaknesses, and 3) take corrective steps to deal with the weaknesses and to build on the strengths (Asubonteng, McCleary & Swan, 1996:76). Although both the Simulation Design Scale as well as the Student Satisfaction and Self-Confidence in Learning instrument are very good and relevant questionnaires (Kardong-Edgren, Adamson & Fitzgerald, 2010), they unfortunately do not incorporate any aspects related to service quality expectations.

PURPOSE OF THE STUDY

The purpose of the current study was to determine the relationship between nursing students' expectations regarding the quality of a simulation managed by the School of Nursing that was part of their training programme and their actual evaluation of the experience of such a simulation.

Definitions of keywords

Empathy relates to the expectations that individuals have regarding the degree to which employees, who provide the service, are caring and provide individualised attention (Parasuraman, Zeithaml & Berry, 1988:25).

    Reliability refers to individuals' expectations related to the consistency of the performance and dependability with which the service is delivered (Parasuraman, Zeithaml & Berry, 1988:25).

    Responsiveness represents the willingness of employees of the service provider to provide the service (Parasuraman, Zeithaml & Berry, 1988:25).

    Service quality can be defined as individuals' expectations regarding the perceived overall performance of an organisation or unit providing a specific service (Parasuraman, Zeithaml & Berry, 1988:15).

    Morgan (as cited by Berragan, 2013:253) defines a **simulation** as an 'educative environment where students have access to authentic tasks, plentiful interactions, and learning in preparation for nursing practice. Simulations may offer an "educative environment" providing opportunities to confront the emotional climate within which nursing skills are performed in the confines of a "safe" or controlled learning environment'.

    Tangibles emphasise the physical evidence of the service being provided, especially in terms of physical facilities, appearance of personnel, and equipment used to provide the service (Parasuraman, Zeithaml & Berry, 1988:25).

RESEARCH METHODOLOGY

Research approach

In order to execute the research, the current study employed a cross-sectional design with a survey data collection technique.

Ethical considerations

Students had the right to refuse to participate. They were also ensured that their responses would be anonymous and that data would only be used and interpreted

for the total group. Ethical clearance was obtained from the Ethics Committee of the Faculty of Health Sciences, University of the Free State.

Data collection

All forty-five nursing students in their third year of training were asked to participate in the study. These students had to have had at least two previous exposures to patient simulations. Data were collected during the second half of 2013 (July through September). Usable data were obtained from 30 nursing students. Students were required to complete the questionnaires using an online platform. The 22-item version of the SERVQUAL measure was used (Parasuraman, Zeithaml & Berry, 1988). Respondents used a 5-point Likert scale to indicate the degree to which they agreed with each statement – the higher the score the more they were in agreement. More specifically, this instrument was used in the current study to operationalise student nurses' expectations regarding service quality of the simulations and support within the School of Nursing. The developers reported acceptable levels of reliability for the various subscales, ranging between .52 and .80 (Parasuraman, Zeithaml & Berry, 1988:25). The current study found the following estimates of reliability (tangibles: α = .78, reliability: α = .60, responsiveness: α = .36, assurance: α = .38, and empathy: α = .60). It is clear that two of the dimensions (Responsiveness and Assurance) have low estimates of reliability.

To measure the student nurses' actual levels of satisfaction with the simulations and support within the School of Nursing, an adapted version of the questionnaire, developed by Bailey and Pearson (1983), was used. The developers reported a reliability of .93 for the complete questionnaire. This adapted questionnaire consisted of 28 dimensions, including relationship between students and the simulation team, quality of feedback received during and after debriefing, the degree to which the simulation is 'lifelike', and the degree to which students believe that the simulation has prepared them for what they need to do in the real world. The current study found an acceptable reliability of .97.

Statistical analyses

In order to determine the relationship between nursing students' expectations regarding the quality of the service delivered by the School of Nursing (specifically the simulation component) and their actual experiences, point-biserial correlations were used. To help with the interpretation of the correlation coefficients, Guilford's informal interpretation of r was used. More specifically, only correlations of .4 and above were considered to be substantial (Tredoux & Durrheim, 2002).

ANALYSIS

Most respondents were female (97%, n = 29) while 60% (18) were from an African ethnic group between 18 and 23 years of age.

Table 1: Descriptive Statistics

Variable	Number of respondents	Minimum	Maximum	Mean	Standard Error
Tangibles	30	3.00	5.00	4.3011	.10533
Reliability	30	4.00	5.00	4.5600	.07265
Responsiveness	30	1.00	4.00	2.2667	.13924
Assurance	30	4.00	5.00	4.7489	.06139
Empathy	30	1.00	4.00	2.5075	.16410

From Table 1 it is clear that students had higher expectations with regard to tangibles, reliability, and assurance as these relate to expectations of service quality.

Table 2: Correlations

Reliability	Tangibles	Responsiveness	Empathy
Feedback received after the simulation (r = .449)	Management showed interest, enthusiasm, support, and participation in the simulation (r = .524)	Harmonious and cooperative relationship between students and facilitators (r = .457)	Effective communication between student nurses and those facilitating the simulations (r = .438)
Reliability of received feedback (r = .454)	Management allocated enough resources (r = .582)	Feedback received after the simulation (r = .443)	
Knowledgeable facilitators to facilitate the simulations (r = .480)	Facilitators had the necessary clinical knowledge (r = .695)	Commitment exhibited by the facilitators (r = .496)	
The School of Nursing has the capacity to host the simulations (r = .457)	Facilitators had the capacity to facilitate simulations (r = .570)	The School of Nursing has the capacity to host the simulations (r = .454)	

Reliability	Tangibles	Responsiveness	Empathy
The School of Nursing made every effort to understand student nurses' needs as applicable to the simulation (r = .410)	Appropriate feedback was received during the simulation (r = .477)	Competent facilitators to facilitate the simulations (r = .482)	
	Facilitators had the necessary interpersonal skills to facilitate debriefing sessions (r = .570)		

It is evident from Table 2 that the variable tangibles (SERVQUAL) have several significant relationships above 0.4. In addition, the variable reliability (SERVQUAL) is significantly related to several of the dimensions. The variables responsiveness and empathy (SERVQUAL) also have some substantial correlations (r>0.4). However, the variable assurance (SERVQUAL) does not have any substantial correlations (r>0.4) with the dependent variables.

DISCUSSION OF RESEARCH RESULTS

The aim of the current study was to determine the relationship between nursing students' expectations regarding the services delivered (more specifically the simulations) by the School of Nursing and the actual experiences of such simulations.

Assurance, a component of service quality, refers to the degree of knowledge and courtesy of the employees who provide the service as well as their ability to inspire trust and confidence. The participants in the current study rated assurance as the most important expectation regarding service quality of the simulation facility hosted and managed by the School of Nursing (mean = 4.8). However, there were no substantial relationships (r>0.4) between this variable and any of the dimensions related to the actual experiences students had with regards to the simulations.

Reliability was the second most important expectation regarding service quality that students had regarding the simulation facility (mean = 4.6). There was a substantial relationship (r>0.4) between this expectation and the actual experience with regards to the feedback they got after the simulation (r = .449) as well as the reliability of such feedback (r = .454). More specifically, the student nurses felt that the facilitators were knowledgeable enough to facilitate the simulations (r = .480), that the School of Nursing had the capacity to host the simulations (r = .457), and that the School of Nursing made every effort to understand their needs as applicable to the simulation (r = .410). It is clear that the student nurses' expectations regarding

the reliability of the service being delivered by the School of Nursing may have been influenced by their experiences related to the feedback they received from the facilitators. In addition, the capacity of the School of Nursing to properly manage the facility and ensure that the facilitators are knowledgeable also might have influenced these students' expectations regarding reliability.

Tangibles were the third most important expectation regarding service quality that students had regarding the Open Space simulations (mean = 4.3). It seems as if their expectations were indeed met with regard to the experiences of the simulation and the Management of the Simulation Facility. More specifically, students found that their needs were met and were related to the degree to which management showed interest, enthusiasm, support, and participation in the simulation (r = .524) as well as the allocation of resources (r = .582). In addition, students felt that the facilitators had the necessary clinical knowledge (r = .695) as well as capacity (r = .570) to host the simulation facility. The students also felt that their expectations had been met regarding the quality of the feedback they received during the simulation (r = .477) and facilitators' interpersonal skills (r = .570) to facilitate the debriefing sessions. Tangibles, such as knowledgeable and caring facilitators as well as the capacity of the School of Nursing to host the simulations, were therefore likely to influence students' expectations regarding service quality.

Students did not have high expectations regarding responsiveness (mean = 2.26). However, their expectations had been met with regard to the harmonious and cooperative relationship between students and facilitators (r = .457), including competence of such staff members (r = .482), the feedback they received after the simulation (r = .443) as well as the commitment exhibited by the facilitators (r = .496) to the simulations. Indeed, students felt that these facilitators did contribute to their overall experience of the School of Nursing's ability to host the simulations (r = .454).

Finally, the students in the current study did not rate empathy as being very important to their overall expectations of service quality (mean = 2.5). However, there was a substantial correlation (r>0.4) between these expectations and their actual experiences related to the communication between themselves and those facilitating the simulations (r = .438).

CONCLUSIONS

When applying the simulation model suggested by Jeffries (2005), the following seems to emerge with regards to the current study. Students had high expectations with regards to the quality of service delivered by the School of Nursing, especially in terms of 1) the degree of knowledge and courtesy of the lecturers who provide the service as well as their ability to inspire trust and confidence, 2) the consistency of the performance and dependability with which the service is delivered, and 3) the physical evidence of the service being provided, especially in terms of physical

facilities, appearance of personnel, and equipment used to provide the service. These three categories of expectations (comprising part of Jeffries's educational practices) seem to have been met when investigating the substantial correlations (r>0.4) between these expectations and their perceptions regarding the outcomes they experienced after participating in the simulations.

When looking at the design characteristics and simulation (Jeffries, 2005), the students seemed to have fairly positive views. More specifically, students felt that the simulation was 'lifelike' and believable (97%) – similar to Jeffries's fidelity dimension – and prepared them for what they needed to do in the real world (93%). In addition, students felt that the complexity of the simulation scenario – similar to Jeffries's complexity dimension – was very good. In addition, students seem to have very positive experiences related to the debriefing they obtained during (96%) and after (92%) the simulation. Debriefing is one of the dimensions associated with the design characteristics and simulation of Jeffries's (2005) simulation model. Previous research has found that discussions between facilitators and student nurses promoted the achievement of course objectives (Jeffries, 2005:99). Discussing issues with the facilitator that might arise during the simulation could lead to better problem solving by student nurses (Weis & Guyton-Simmons, 1998). In addition, debriefing allows the student nurses to link theory with practice, think critically, and may assist them to behave professionally in complex situations (Jeffries, 2005:101).

Considering the outcomes highlighted by Jeffries's (2005) simulation model, the students were very satisfied (90%) that the simulations had met their expectations and that the School of Nursing has the necessary capacity to host the simulations (93%). These findings were fairly similar to those reported by Jeffries (2005:102) as applicable to the learner satisfaction dimension. Finally, when considering the dimensions of skill performance and critical thinking, related to the proposed outcomes of the simulation model (Jeffries, 2005), the simulations seemed to have stimulated their critical thinking by requiring them to respond using a multidisciplinary approach (90%) as well as requiring them to effectively communicate as a team (79%).

Kirkpatrick (1979) suggested that the impact of training could be evaluated at four different levels. When applying these four levels to nursing, the first level emphasises how satisfied student nurses are regarding the simulation. The second level focuses on the degree of learning that has taken place during the simulation. The third level underscores the impact of the simulation to foster appropriate behaviours such as teamwork or communication. Finally, the fourth level highlights the impact of simulation-based learning on patient care and safety. Students were asked to indicate the degree to which their expectations were met by the simulations. The majority of the students (90%) responded positively, viewing it as useful and positive. It seems as if the respondents were very satisfied with their experiences, which is associated with level 1. When looking at Kirkpatrick's level 3, which relates to the impact of the simulation to foster appropriate behaviours, 28 students (93%) responded positively,

stating that the simulations had prepared them sufficiently for what they needed to do in the real world. In addition, 26 students (86%) felt that the simulations encouraged multidisciplinary responses to adequately complete the simulations.

Various characteristics of the simulations contributed to the positive experiences of the students. To ensure that the School of Nursing maintains the capacity to host simulations in future, as well as maintain positive experiences from students, they should have caring and well-trained staff who can facilitate learning using state of the art equipment and facilities. In addition, they would do well to constantly maintain high levels of quality in terms of the training provided to student nurses. In addition, students should receive feedback during and after a simulation regarding their performance. All these aspects are likely to result in students having positive experiences related to service quality. Finally, staff members who are willing to help students during the simulations are more likely to result in positive service experiences by students.

RECOMMENDATIONS

Although the current study took the first tentative steps to conduct research regarding the relationship between service quality expectations related to simulations and the actual experiences of such simulations among a group of nursing students, there are suggestions for future research (Issenberg, Ringsted, Østergaard & Dieckmann, 2011).

Using Kirkpatrick's four levels of evaluating training outcomes, future research focusing on the outcomes of simulations may try to answer some of the following questions (Issenberg, Ringsted et al, 2001:161):

What kind of learning needs assessment is required regarding simulation-based learning, and what instruments need to be developed to better estimate learning needs accordingly?

What is the effect of simulation-based learning on 'preparation for future learning' and how can this construct be defined and measured?

How should behavioural complexity be measured at the individual, team and organisational level and the interconnections between these levels and their influence on behaviour?

Research questions related to the design of simulations, and how such simulations could impact on learning acquisition, the retention of skills, and cognitive load may also be fruitful topics for future research. Future research focusing on the outcomes of simulations should try to answer some of the following questions (Issenberg, Ringsted et al, 2011:157):

How do theories of cognitive load inform the design and structure of simulation programmes, courses and concrete scenarios based on the complexity of the tasks required for learners to acquire and maintain? (Issenberg, Ringsted et al, 2011:157).

For example, simulations where nursing students have to perform basic life support may require less cognitive load, than simulations that require advanced life support.

What are the relevant characteristics of debriefing that lead to effective learning? More specifically, 'What are the differences in outcomes between faculty-led and peer-led or self-guided debriefings?' (Issenberg, Ringsted et al, 2011:157).

LIMITATIONS OF THE STUDY

Although the current study found encouraging results related to high satisfaction levels of nursing students who had previous exposure to simulations, there is still room for improvement.

Future researchers should try to sample from more than one school to facilitate comparisons among programmes. Hopefully with a bigger sample, researchers should be in better position to use a higher correlation as indicative of a substantial relationship.

Two of the dimensions of the SERVQUAL instrument used in the current study (Assurance and Responsiveness) had low reliability estimates. Previous researchers reported acceptable reliability estimates for these two dimensions. Although the current study checked the wording of the questionnaire for clarity and understanding, these two dimensions might require additional inspections within the field of nursing. Although lower reliability estimates might have impacted the results of some of the correlations, only the assurance dimension had no substantial correlations ($r>0.4$) with any of the dimensions associated with the student nurses' levels of satisfaction regarding the simulation and the management thereof.

The current study could only determine training effectiveness, as proposed by Kirkpatrick, with regards to satisfaction and the impact of the simulation to foster appropriate behaviours. Future studies should try to incorporate all four levels of training effectiveness.

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