

Critical thinking skills and clinical decision making in nursing and midwifery students: A case study of Masvingo provincial hospital in 2014 in Zimbabwe

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Abstract

Objective (s): To establish the level of critical thinking skills of student nurses and student midwives at Masvingo Provincial Hospital in Zimbabwe.

Materials and Methods: A descriptive correlation quantitative research was employed as the design. Stratified and convenience sampling method was used to recruit 125 study participants. Questionnaires were used to collect data. A Pearson's correlation coefficient matrix was used to explore the relationship between critical thinking and clinical decision-making. The Holistic Critical Thinking Scoring Rubric was used to rate responses to the case-study based questionnaire. Analysis of data was conducted using SPSS-20 software.

Results: Results showed a positive significant relationship between critical thinking and clinical decision-making ($r = 0.207$, $p = < .01$) $r = 0.207$ implies that as critical thinking increase clinical decision-making marginally improves and ($p = < .01$) explains 10% variance in Critical Thinking and Clinical Decision-Making. ($F = 5.501$) implies that the linear relationship between critical thinking and clinical decision-making is significant. $R^2 = 0.035$, the co-efficient of determinant 0.035 implies that critical thinking is responsible for 3-5% of changes in clinical decision-making. $\beta = 0.207$ implies that when critical thinking changes by one unit clinical decision-making improves by 0-20 times. The findings of the study indicated that if student nurses and student midwives are given knowledge of critical thinking skills their clinical decision-making would improve by 3-5%. This shows that there are other factors determining critical thinking skills which should be identified and addressed.

Conclusion: Utilisation of teaching methodologies that instill critical thinking skills in schools of nursing and midwifery may improve critical thinking in student nurses/midwives.

Keywords: Critical thinking, clinical decision-making, clinical judgement, clinical reasoning, holistic critical thinking scoring rubric

1. Introduction

The availability of sufficient and competent health professionals with appropriate skills is central to the success of the transformation process of the health care system (South African Nursing Council Scope of Practice, 2008). Critical thinking, as a graduate attribute, is considered by many authorities to be an essential quality for nursing and midwifery practice (Jones: 2010). Ashcroft (2009) on the other hand, supports this assertion that critical thinking skills are vital in making safe and efficient clinical decisions. Students' theoretical performance has improved greatly as compared to the past decade at Masvingo Provincial hospital in Zimbabwe. Despite the good pass rate ranging from 80% to 100% for each intake, there has been a public outcry that the quality of nursing/midwifery should improve in Zimbabwe. The gap in theoretical and clinical performance is vast. This trend has raised concerns within the local nursing/midwifery profession regarding the critical thinking skills and clinical decision making abilities of students. Therefore this study focused on the level of critical

thinking skills of nursing/midwifery students in relation to clinical decision making.

2. Methodology

Nursing and midwifery students were selected from Masvingo Provincial Hospital School of nursing and midwifery. The researcher assumed that there was no correlation between critical thinking and clinical practice in about 25% of the participants, therefore decided to use 10% as margin random error and 95% confidence interval. This means that the researcher was 95% confident that the percentage of no correlation between critical thinking and clinical practice was going to be between 15% and 35%. Alfa significance level was less than 0.05 and response rate was 80% using 2 standard deviations. The sample size was calculated as follows:

$$\begin{aligned} N &= (SD/SE) \text{ squared} \\ &= (10/1) \text{ squared} \\ &= 100 \text{ sample size, } 80\% \text{ power} \end{aligned}$$

$N = 100/0.80 = 125$. Therefore this research study used a sample size of 125 subjects.

2.1 Ethics

Only participants who gave documented voluntary consent where involved in the study and were supposed to be on site during that period. The student nurses in their second and third year of training were included since they had done obstetrics. Student midwives who were in the introductory block and those who had completed or were in the senior block who gave consent were also included. Permission to carry out the study was sought from the Medical Research Council of Zimbabwe, Provincial Medical Director of Masvingo Province and the Medical Superintendent of Masvingo Provincial Hospital. MRCZ is an ethical review board for protection of human subjects in a study. A written informed consent form was utilised for the protection of the subjects' rights. Potential benefits of the study were highlighted to subjects which thereafter subjects gave permission to participate in the study. The subjects were given objectives of the study and informed consent obtained.

2.2 Data Management

Data was collected in five days using questionnaires on 125 subjects.

2.3 Data Presentation and Analysis

The researcher entered data directly from the instrument into the computer outlet. It cleaned and detected coding and input errors by checking raw data on the collection tool against the data that were entered into the computer. A statistician was utilised to assist in data analysis. The data was analysed using the statistical package of social sciences (SPSS-PC20). Simple demographics were analysed using descriptive statistics such as frequencies, percentages, mean, mode and standard deviation.

Clinical decision making as the dependent variable was analysed using the descriptive statistics. The researcher used correlation and Pearson's regression analysis to examine the relationship between critical thinking skills and clinical decision making. Inferential statistics were used to determine the relationship between the independent and dependent variables. Linear regression analysis was used to test the strength of the relationship between critical thinking skills and clinical decision making. The relationship is reflected by the research question: 'What is the correlation between critical thinking skills and clinical decision making? The results were presented in table format using frequencies and percentages.

3. Results

One hundred and twenty-five respondents were included in the study. The response rate was 100 percent. The highest number of participants was within the 25-30 and 31-35 years age group which is mature and productive. There were more females 106 (84.8%) than males 19 (15.2%) in training. Eight four (67.2%) participants had ordinary level passes and 41 (32.8%) had advanced level passes. This gave them an advantage of being able to search, evaluate and analyse information as a guide of developing one's thinking. There were 47 (37.6%) student nurses and 78 (62.4%) who

participated in the study. Student midwives are more than student nurses because there are three intakes of midwives per year and two intakes of student nurses. This is done to fulfil the goal of the Ministry of Health and Child care in Zimbabwe which aims to achieve its target in ensuring that health services are accessible to the majority of the population of Zimbabwe through midwifery training in order to achieve the millennium developmental goals 4 and 5 (Midwifery Diploma Curriculum, 2012). Senior midwifery students were the highest level of training with 54 (43.2%) participants, 23 (18.4%) junior student midwives, 14 (11.2%) third year students and 32 (25.6%) second year student nurses. All levels of students who had done obstetrics were represented.

Generally, the overall performance was good because 98 (78.4%) respondents were rated in level three and four which is acceptable and 27 (21.6%) of the respondents were rated level one and two which is very poor. However, the number of critical thinkers outnumbered the non-critical thinkers so they could be assisted through collaboration as highlighted by Lemire (2007)^[16]. This means that those who were rated level two and one could be assisted by employing strategies like; critical thinking through collaboration; discussions, task-related group work, peer review and debates. Group collaboration is effective for promoting critical thinking because: An effective team has the potential of producing better results than an individual; students are exposed to different perspectives while clarifying their own ideas. (Lemire, 2007)^[16]. Those who scored lowest marks especially the third year students who were attending their revision block perhaps were concentrating on achieving grades or pass mark as highlighted by Yildirim (2010) that students' attitudes can hinder learning critical thinking skills such as resistance to active learning so they focus on grades rather than learning. Responses on strategies that can stimulate critical thinking in students. 90 (72%) stated that it is true that thinking through inquiry can stimulate critical thinking, 31 (24.8%) stated that it is not true and 4 (3.2%) left blank spaces. 91 (72.8%) agreed that inquiry based instruction can stimulate critical thinking, 31 (24.8%) thought it is false and 3 (2.4%) left blank spaces. 111 (88.8%) stated that critical thinking through collaboration can promote critical thinking, 10 (8.0%) disagreed that it is false and 4 (3.2%) left blank spaces. 77 (61.6%) agreed that clinical logs can promote critical thinking, 44 (35.2%) stated that it is not true and 4 (3.2%) left blank spaces. 101 (80.8%) agreed that experiential learning promotes critical thinking, 20 (16.0%) stated that it is false and 4 (3.2%) left blank spaces. 88 (70.4%) expressed that it is true that student-led rounds promote critical thinking, 33 (26.4%) stated that it is false and 4 (3.2%) left blank spaces. 107 (85.6%) thought that it is true that simulated clinical experiences promote critical thinking, 14 (11.2%) thought that it is false and 4 (3.2%) left blank spaces. Ninety-seven (77.6%) stated that social interaction promotes critical thinking. 23 (18.4%) thought it is not true and 5 (4.0%) left blank spaces implying lack of knowledge. An average of 95 (76%) expressed that it is true that thinking through inquiry, inquiry-based instruction, critical thinking through collaboration, clinical logs, experiential learning, student-led rounds, simulated clinical experiences and social interaction. 30 (24%) expressed that

the mentioned strategies do not promote critical thinking skills. This indicates knowledge deficit. Those who stated that it is true agree to what was highlighted by Kuhn & Dean (2010) that instructional activities such as problem-based learning, inquiry-based learning, social interaction, nature of course content, technology integrated instruction and extracurricular activities.

4.15 indicates that there is a relatively significant relationship between qualification and critical thinking. Low levels of critical thinking are needed when making minor decisions for major decisions high levels of critical thinking are more related to higher qualifications and advanced age. Correlation is 0.214 implies there is a weak positive relationship between critical thinking and qualifications. $r^2 = 0.038$. F statistic= 5.908 (significant) ($p = < .01$) as qualifications increase that is academic and level of training, critical thinking also increases=5.908 implies that the linear relationship between critical thinking and qualification is significant. $R^2=0.038$ the coefficient of determination, 0.038 implies that qualification is responsible for 3-8% of changes in critical thinking=0.214 implies that when qualification changes by one unit, critical thinking improves by 0-21times.

Table 1: Critical Thinking versus Clinical Decision Making, N=125

Variable	B	SEB	Beta
X			0.207***
Constant	104.93	9.19	
$r = 0.207$	$r^2 = 0.035$	F= 5.501	
* $P < 0.05$	** $P < 0.01$	*** $P < 0.001$	

The above table shows the strength of relationship between the independent variable Critical Thinking and dependent variable Clinical Reasoning at a significance level of 0.05. Results came out at a significance level of $r = 0.207$, ($p = \leq 0.01$). Application of the Pearson Correlation coefficient test of critical thinking showed that there is a weak positive relationship between critical thinking and clinical decision-making. This means that as critical thinking increases, clinical decision-making marginally improves. F statistic is 5.501; this implies that the linear relationship between critical thinking and clinical decision-making is significant. The co-efficient of determination r^2 is 0.035 implies that critical thinking is responsible for 3.5% of changes in clinical decision-making. Beta 0.207 implies that when critical thinking changes by one (1) unit clinical decision-making improves by 0-20 times.

4. Summary of Findings

The purpose of this study was to determine the level of critical thinking skills and examine the relationship between critical thinking skills and clinical decision-making of nursing and midwifery students at Masvingo Provincial Hospital School of nursing and midwifery using the critical thinking model adapted from The Holistic Critical Thinking Score Rubric which was used to come up with the critical thinking ratings of different levels of students. Data analysis using descriptive statistics making use of frequencies, percentages, means and averages were used to describe the knowledge levels of student nurses/midwives on critical thinking and clinical decision-making. Inferential Statistics

especially the Pearson Product Moment test was used to examine the relationship between independent variable; critical thinking and dependent variable; clinical decision-making. Simple regression analysis was used in order to examine the strength of relationship between the independent variable and dependent variable at a significance level of 0.05. Results came out at a significance level of $r = 0.207$, ($p = \leq 0.01$). Application of the Pearson Correlation coefficient test of critical thinking showed that there is a weak positive relationship between critical thinking and clinical decision-making. This means that as critical thinking increases, clinical decision-making marginally improves. F statistic is 5.501; this implies that the linear relationship between critical thinking and clinical decision-making is significant. The co-efficient of determination r^2 is 0.035 implies that critical thinking is responsible for 3.5% of changes in clinical decision-making. Beta 0.207 implies that when critical thinking changes by one (1) unit clinical decision-making improves 0-20 times. Regarding knowledge, a regression analysis was also done where the independent variable was the qualifications. The qualifications included academic and level of training. The dependent variable was critical thinking, the correlation was $r = 0.214$ implies weak positive relationship $r^2 = 0.038$ implies that qualification is responsible for 3.8% of changes in critical thinking F statistic=5.908(significant) which implies that the relationship is significant. This means that as qualifications increase, critical thinking also increase. The mean score for clinical decision-making was determined as 10.64(SD± 2.9) for student nurses and 10.52 (SD± 3.44) for student midwives. No significant statistical difference was noted between the two groups. The mean score for Critical Thinking was 51.66(SD: ± 7.10) for student nurses and 53.27 (± 4.98) for student midwives. The student midwives got higher marks on Critical Thinking but no statistical significance was revealed. Correlation between Critical Thinking ability and age, gender and qualifications were assessed using Pearson Correlation Co-efficient and Linear Regression Analysis. In contrast, the mean score of Clinical Decision Making had significant statistical correlation with age and total qualification.

The scores of critical thinking were high and those of Clinical Decision Making were low. There is a weak positive relationship between scores of Clinical Decision and Critical Thinking skills. This is in accordance with the findings of other studies carried out by Shin, Hill and Martin (Iranian Journal of Nursing and Midwifery Research Winter 2007; Vol., 12, No 1). In contrast, other studies carried out by Gordon and Hicks (2003) could not reveal significant correlation between the two skills. Duchescher (2007) believes that being unable to find a correlation between Critical Thinking and Clinical Decision Making abilities results from the absence of suitable tools to measure them, rather than lack of correlation. There is need for further studies to evaluate the validity and practicality of the tools. Another study conducted in Trinidad and Tobago in 2008 revealed that the average Critical Thinking ability of the group was below the acceptable level 3 on the Critical Thinking rating scale. In contrast, this study revealed the average Critical Thinking ability of the student nurses as above level 3 with 98 (78.4%) of the participants rated level

4 and 3. This implies that the students have knowledge on critical thinking but they fail to synthesise and act on clinical information.

It was shown that there was cognitive failure in 106 (84.8%) of the respondents to identify adverse clinical events, synthesise and act on clinical information. Only 19 (15.2%) of both the nursing/midwifery students were able to analyse the given scenario. Most of the responses were missing in this section. This is supported by Del Bueno (2005) who postulated that although nurses/midwives had good content knowledge and adequate procedural skills, they frequently lacked the clinical reasoning skills needed to respond appropriately to critical situations. On the other hand, Benner (2007)^[4] further professes that clinical reasoning is challenging and requires a different approach from that used when learning routine nursing/midwifery procedures. According to Erickson *et al* (2007) learning to reason effectively does not happen automatically but it requires determination and active engagement in deliberate practice for continued learning. It also requires reflection, particularly on activities designed to improve performance.

4.1 Theoretical Framework

Critical Thinking model for nursing/midwifery judgement that was used to guide the study was adapted from Kuiper *et al.* (2011)^[15]. Increasingly, the characteristic that distinguishes a professional nurse is cognitive rather than psychomotor ability (Halpen, 2008). Critical Thinking is an essential component of nursing/midwifery, yet no clear definition or conceptualization of Critical Thinking for nursing judgement has existed. Fisher (2011)^[9] supports this assertion that lack of consensus and overlapping definitions may diminish the profession's ability to articulate this concept and facilitate its development. Critical Thinking Model for nursing judgement specifies five components namely: Specific knowledge base, Experience, Competencies, Attitudes and Standards. The model has three levels which are: basic, complex and commitment.

The model emphasises that, to be a critical thinker one should have specific knowledge base and with experience and commitment one becomes competent to make sound clinical decisions when rendering care to the clients/patients. In addition, to knowledge, positive attitudes and standards must be maintained. Clinical reasoning can be possible if one has critical thinking skills (Gocsik, 2006)^[11]. Alfaro (2011) highlights that critical thinking is an umbrella term that includes many aspects of reasoning inside and outside the clinical setting. One's ability to reason outside of the clinical setting affects one's ability to reason in the clinical setting. This means that if the student fails to reason in the classroom, then it would be difficult for that person to make sound professional clinical judgement in the clinical setting. Without critical thinking skills it is difficult to correlate theory into practice (Alfaro, 2011). In this study, thinking ahead was demonstrated by respondents when they managed the woman in the given scenario though most of the respondents failed to anticipate what could happen and decided to leave blank spaces. Thinking in action was also difficult to implement since most of them could not apply the nursing process to determine, prevent and manage the patient's problems. The respondents did not realise that it was an obstetric emergency so did not call for help, most of

them managed the patient alone and some even prioritised breastfeeding instead of establishing the source of bleeding. In this study reflective thinking was supposed to be seen on analysis of the given scenario whereby respondents were supposed to recall other similar situations and how they managed the patients. What they did right and what they did not do well so that they could be able to manage the patient instead of basing on assumptions. Use of the critical thinking model in this study helped to identify the knowledge of students on the Nursing/Midwifery process.

4.2 Implications to Nursing/Midwifery Education

The study findings revealed that most students study to achieve grades. If this is left unchecked, more and more students will be produced but being of poor quality. They will be unable to correlate theory into practice. This is supported by the Australian Nursing/Midwifery Council (2005)^[2] which highlighted that universities are committed to adequately prepare Nurses/Midwives but the health services complain that the graduates are not work-ready. Many Nurse/Midwifery graduates fail to make sound clinical decisions so there is need for nursing/midwifery education to foster critical thinking skills for nurses to be diligent in management of patients. This may involve giving practical advice on the importance of critical thinking in Nursing/Midwifery practice.

The findings of the study also indicated that if student nurses and student midwives are given knowledge of critical thinking skills their clinical decision-making would improve by 3 to 5%. This shows that there are other factors determining critical thinking skills which should be identified and addressed. Some of the factors are; socialisation, work culture, power relations, exposure to higher education, shortage of human and material resources, students' attitudes and lack of faculty time to develop appropriate teaching strategies. This indicates the need for Nurse/Midwifery educators to incorporate critical thinking into the curriculum. They must either lobby for an increase in classroom time or decrease content in order to teach concepts rather than facts. According to Lemire (2007)^[16] the body of nursing is too vast for students to memorise facts. They must learn to synthesize and analyse information. Lemire (2007)^[16] further argued that critical thinking has been positively associated with active learning strategies and the degree to which students interact with instructors and each other. If content can be clustered and presented efficiently, students gain additional time for critical thinking reflection (Lemire, 2007)^[16].

4.3 Implications to Nursing/Midwifery Research

Perceptions and experiences of Nursing/Midwifery educators about critical thinking skills need to be explored. If research does not address these issues through scientific inquiry to bring out evidence-based information on the implementation of the critical thinking skills teaching strategies, they will continue to make inappropriate choices. This was professed by De Bueno (2005) that although Nursing/Midwifery students have good content knowledge and adequate procedural skills, they frequently lacked the clinical reasoning skills needed to respond appropriately to critical situations.

4. Conclusion

Regarding low scores student nurses and student midwives got on clinical decision-making, the Nursing/Midwifery students should learn to reason effectively but it requires determination and active engagement in deliberate practice for continued learning. It also requires reflection, particularly on activities designed to improve performance.

5. Recommendations

Based on the findings, the main recommendations are:

1. Education and guidance are required in empowering nurse/midwifery tutors about the benefits of critical thinking through workshops and in-service training.
2. Nurse/midwifery leaders to advocate for inclusion of critical thinking skills in the curriculum by influencing policy, to enable educators to have adequate time to concentrate on teaching critical thinking skills than content.
3. Need for nurse/midwifery educators to incorporate critical thinking into the curriculum. They must either lobby for an increase in classroom time or decrease content in order to teach concepts rather than facts.
4. Content to be clustered and presented efficiently so that students gain additional time for critical thinking reflection.
5. Educators and nurse administrators should come up with a clear acceptable definition of critical thinking as applied to clinical practice.
6. Educators should stop spoon-feeding the course-content since it does not stimulate critical thinking instead they should utilise teaching strategies that foster critical thinking such as case studies, inquiry-based instruction, collaboration, discussions, experiential learning and problem-based learning.
7. Educators should give students practical advice on the importance of critical thinking in nursing/midwifery practice.
8. Educators to utilise open-ended questions and encourage students to ask questions.
9. Educators should give students reading assignments to stimulate critical thinking whereby students are asked to summarize the main points, identify implications for change, propose counter arguments, analyse strengths and weaknesses of articles.
10. All schools of nursing/midwifery should encourage students to have clinical log books as this help them to go through the critical thinking model where they would look ahead when confronted by a certain situation in the clinical area, critically evaluate their own thought processes and actions. This would also help them to reflect on past management and were they went wrong and correct themselves.
11. The faculty should emphasise to the students that clinical time must be utilised to master clinical skills and become proficient at a variety of nursing procedures and it is also time to improve thinking skills.
12. Inquiry-based learning should be done at each level of training whereby students are asked to formulate a research question associated with nursing/midwifery problems encountered at each level. This will encourage them to be familiar with current nursing/midwifery literature and utilise research

findings to improve patient care.

13. Students to be taught to see the connection between abstract theory concerning what we believe and actual observations we make on real patients. This will help them to be able to link research and clinical practice as well as to associate nursing/midwifery theory, research and critical thinking with real life nursing/midwifery actions.
14. Educators to enhance critical thinking skills of students by making them lead the ward rounds; this would help them to gather, organise and prioritise assessment data, distinguish between relevant and irrelevant data and develop appropriate nursing/midwifery diagnoses.
15. Further studies need to be conducted to find out educators' perceptions and experiences on critical thinking skills of student nurses and midwives. This will enable use of information in counselling students.

6. References

1. Alfaro-Lefvre R. Critical Thinking and clinical judgment: A practical approach to outcome focused thinking. 4th Edition. St Louis, Elsevier, 2009.
2. Australian Nursing and Midwifery Council (ANMC). National Competency Standards for the Registered Nurse, 2005.
3. Bandura A, Locke E. Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*. 2003; 88:87-99.
4. Benner P. From novice to expert: Excellence and Power in clinical nursing practice. Uppersaddle River. Prentice Hall, 2007.
5. Botman Y *et al*. Research in health sciences. Cape Town. Pearson Education, 2010.
6. Burns N, Grooves SK. The practice of nursing research appraisal, synthesis and generation of evidence. 7th edition. Missouri. Saunders, 2013.
7. Cooper D, Schindler P. Business Research Methods. 11th edition. McGraw-Hill, 2010.
8. Facione PA, Facione NC. Holistic Critical thinking scoring Public. Millbrae CA: California Academic Press, 2006.
9. Fisher A. Critical thinking an introduction. Cambridge: Cambridge University Press, 2011.
10. Friedman NP *et al*. Individual differences in Executive functions are almost entirely genetic in origin. *Journal of Experimental Psychology General*. 2008; 137:201-225.
11. Gocsik K. Teaching critical thinking skills, UTS Newsletter. 2006; 11(2):1-4.
12. Gordon JM. Congruency in defining critical thinking by nurse educator and non-nurses scholars. *Journal of advanced nursing*. 2010; 39(8):340-350.
13. Halpern DF. Thought and knowledge: An introduction to Critical Thinking. 4th edition
14. ICM Triennial Report. 2008-2011, 2008.
15. Kuiper RA *et al*. Thinking strategies of baccalaureate nursing students prompted by self-regulated learning strategies. *Journal of Nursing Education*. 2011; 49(8):429-436.
16. Lemire J. Leader as critical thinker nursing leadership forum, 2007.
17. Mun J. Critical Thinking. An Exploration of Theory

- and Practice. Routledge, London/New York, 2008.
18. Polit, Beck. Essentials of nursing research. 3rd Edition. London. Stanley Thomes, 2014.
 19. Quinn's Principles of practice of nurse education. 7th Edition. London. Stanley, 2013.
 20. Sandstrom S. Use of case studies to teach diabetes and other chronic illnesses to nursing students. Educational Innovation. 2006; 45(6):229-232.
 21. Saunders Lewis, Thornhill A. Research methods for business students. Pearson Education. Delhi. India, 2007.
 22. Scheffer B, Rubenfeld MG. Critical thinking tactics for nurses, achieving the IOM competencies.3rd Edition. Michigan. Jones and Bartlett, 2015.