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The identification of the role and competencies of the graduate nurse in recognising and responding to the deteriorating patient in an acute ward environment: A mixed methods study

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Chapter 5

Quantitative Data Collection and Analysis

Introduction

The previous chapter discussed phase one of the study design and the development of the Q-Role and Q-Comp questionnaires. This chapter focuses on phase two providing a description of the sample population, including permission and recruitment processes. It will discuss the data collection and data analysis used for the questionnaires including the statistical methods employed.

Phase 2 Data Collection

Population and sample.

The target population for the study were newly qualified graduate registered nurses (GRNs) working within an acute hospital setting in the Perth metropolitan area. This area comprises around 28 metropolitan hospitals, 14 are considered acute hospitals, ten of which have an Emergency Department. At the time of undertaking this study, there were approximately 1226 GRNs registered on the GradConnect program conducted by the Department of Health, Western Australia. This number of GRNs equated to around 75% of all newly qualified nurses who had completed their pre-registration nursing studies in Western Australia for the year of 2012 (Chief Nurse C. Stoddard personal communication, August 7th 2012).

Recruitment of graduate registered nurses.

Recruitment of the graduate registered nurses was multifaceted. Following approval to undertake the study by the University of Notre Dame (UNDA), Human Research Ethics Committee (HREC), contact was made with the Department of Health Western

Australia via an email to the Chief Nurse, the Research Projects Manager and the GRN Connect program coordinator. The email outlined the study and sought permission to contact the GRNs enrolled in the program for the Perth metropolitan area. Following discussions and clarification of the research objectives, permission was granted by the Chief Nurse of the Department of Health, Western Australia to contact the GRNs enrolled on the program. A list of 998 email addresses for the 2012 intake of the GRN Connect program was supplied. This number equated to 90.72%.

The next step in the recruitment process was to contact the 998 GRNs via email. The email contained a hyperlink to a "youtube" multimedia video clip which introduced the researcher and provided information regarding the study (see Appendix 8). By visualising the researcher and listening to an informal overview of the project and its aims, it was hoped graduates would be more immersed and inclined to participate in the research.

Sample inclusion criteria.

The criteria for the sample selection included: completion of an undergraduate nursing degree or equivalent; current registration with the Australian Health Practitioner Regulation Agency (AHPRA) as a Division 1 registered nurse in Australia; working currently within the Perth metropolitan area; employment in an acute hospital setting; and enrolled on the GradConnect program. Both public and private acute hospitals were included as both utilise the Department of Health GRN Connect program

Risks and benefits outlined to participants.

The risks and benefits of participating in the study were outlined to potential participants (see Appendix 8). A benefit was the opportunity to provide valuable information and insight into their role and competencies used in managing the deteriorating patient. The risks in participating were determined to be low. The participants were all informed of the UNDA policy relating to the protection of research participants, and provided with the contact details for any enquiries.

Data collection process

The data collection process required the Q-Role and Q-Comp to be administered online over a two month period. Part 1 consisted of the Q-Role and parts 2, 3 & 4 were related to the Q-Comp questionnaire. Each of the four separate parts of the questionnaires was sequentially administered at intervals of two weeks to the participants to complete and submit.

Role questionnaire (Q-Role)

An initial email concerning the Q-Role was sent to the potential participants containing information about the aims of the study and outlining the process for completing the questionnaire (see Appendix 8). The email provided information regarding confidentiality and consent for participation in the study along with a time frame for completion of the Q-Role. After a period of one week, an email was sent as a reminder to complete the questionnaire before the deadline.

Within the initial email, there were several hyperlinks for participants to follow. One of the hyperlinks directed them to the initial Q-Role questionnaire and an information page. The page asked the participants to confirm their consent for participation in the study before moving to begin part 1 Q-Role. A hyperlink allowed participants to "opt out" of the study. By clicking this link participants were automatically removed from the email contact list and no further contact regarding the study was made.

Following the initial instruction and consent page, the Q-Role contained ten demographic questions. A unique code was assigned to each participant to ensure that anonymity was maintained but allowed demographic data to be matched to later responses provided by the same participant in phase 2 of the study.

The Q-Role data was collected using 75 closed ended statements on 14 pages, and related to the eight core themes identified from the literature review. These included: definition, detection & frequency of clinical deterioration; undergraduate &

postgraduate preparation; role in deterioration; knowledge levels; confidence; competence; clinical management of deterioration; and clinical support of graduates. Several statements were presented together on a single page. The participants were instructed to read each statement and rate their level of agreement with the statement using a 5 point Likert scale response: Strongly Agree; Agree; Undecided; Disagree; Strongly; Disagree. A progress bar provided the participant with a visual indication of their progress in completing the Q-Role. The participants could return to previously answered ratings and alter them before submission. Once all of the 75 statements had been rated, participants could click a submit button to save their responses for collation. Two weeks from the initial email, the Q-Role was closed.

Competency questionnaire (Q-Comp)

Over a period of six week, three further emails were sent to the participants who remained on the contact list from completing the Q-Role. The emails were sent at intervals of two weeks and contained information regarding the three parts of the Q-Comp. Each of the emails contained an embedded hyperlink to the relevant part of the Q-Comp for completion by the participant. The three parts represented the five domains identified by the UKDH (2009) "Acutely Ill Competency Framework". The three parts of the Q-Comp were (see Appendix 9):

1. Airway, Breathing, Ventilation and Oxygenation Domain (contained 15 competency groups in total)
2. Circulation Domain (contained 27 competency groups in total)
3. Acute Neurological Care Domain, Transport & Mobility Domain, Patient Centred Care: Team Working and Communications Domain (contained 37 competency groups in total)

Each part of the Q-Comp had a similar format in that each contained an introductory instruction page and secondary consent. Once the participant had given their consent, they could progress to through the remainder of the questionnaire. Each competency group was presented on a separate page. Participants were requested to rate the competency for importance to their current clinical role using a four point

Likert scale; Very important; Important; Of little importance; Not important. Once this task was completed an algorithm within the online survey software determined the next question for the participant to answer. A bar provided the participants with a visual indication of their progress. Participants could return to previous answers prior to submission. Once all of the competency groups within the domain had been rated, the final page of the Q-Comp requested participants to save and submit.

Data Analysis Process for Q-Role and Q-Comp

The data from Q-Role and Q-Comp were both nominal and ordinal levels of measurement. Descriptive statistical analysis was used to provide structure, and elicit meaning from the data (Polit & Beck, 2004). These statistics were the numerical procedures or graphical techniques that were used to describe and organise the characteristics of the sample. Such characteristics included the measure of central tendency, as well as the dispersion or variance within the scores (Fisher & Marshall, 2008). These were successfully completed within the study.

Several statistical techniques were applied to the data. Initially ordinal data from the Likert scale ratings of the Q-Role and Q-Comp was recoded from string data into numerical data. This involved changing the Likert scale responses into numerical categories by creating spreadsheets using the Microsoft Excel (2010) program. Conversion from a string to numerical format made the data easier to use within the SPSS™ Ver.24 (IBM SPSS, 2016) statistical analysis software package. The formatted data was separated into the-Q-Role and Q-Comp parts.

On discussion with the UNDA biostatisticians, there were no significant gain from differentiating between those participants that agreed and those that strongly agreed with the statements posed in the Q-Role. In effect all were "agreeing" and this was the item being measured. The same stance was taken with regards to differentiating between those participants that strongly disagreed and those that disagreed with the statements presented. The scale was subsequently collapsed and

simplified for data analysis purposes. This process transformed the Likert scale responses from a 5 point scale into a 3 point scale; 1 = Agree; 2= Undecided & 3 = Disagree.

Analysis of the nominal demographic data was undertaken using frequency distributions. Nominal data analysis relates to the sorting of cases into categories and measuring dispersion based on the count (frequency) of cases in each of the categories, termed the frequency distribution (Fisher & Marshall, 2008). The participants to each of the four parts of the questionnaire were analysed and summarized by grouping them into nominal demographic categories of age, gender, area of speciality, private or public hospital and university of undergraduate study. These demographic details utilised frequency distributions and cross tabulation statistical analysis in SPSS™ Ver.24 (IBM SPSS, 2016). This procedure was done by separating the nominal demographic categories and analysing the frequency distributions from the ordinal data of the Likert scale responses with the demographic categories.

The ordinal level of measurement involved placing participants into hierarchically ordered categories, such as those generated by Likert scale responses (Fisher & Marshall, 2008). The ordinal data from the Likert scale responses to Q-Role and Q-Comp were initially analysed using rank-ordered frequency distributions to summarize the levels of agreement or disagreement with the statements posed in each questionnaire. This rank-ordered data was then further analysed using measures of central tendency including median and modes for the responses provided. This process allowed analysis of distribution and variance to be undertaken. The ordinal data for each of the questionnaire parts was also cross tabulated with demographic data to identify the rank-ordered frequencies, dispersion and variance across age, gender, area of speciality, private and public hospital and university of undergraduate training using the SPSS™ Ver.24 (IBM SPSS, 2016).

The ordinal and nominal data were then analysed for statistical independence using the chi-square test for independence. The chi-square test compares two variables to establish if they are related, testing whether distributions of categorical variables differ from each other (Fain, 2015). This was done using the SPSS™ Ver.24 (IBM

SPSS, 2016) program to calculate the chi-squares and p values from cross tabulated data comparing the nominal demographic categories with the ordinal Likert responses for each of the 4 parts of the questionnaires.

It was evident during the statistical analysis that in some of the chi-square contingency cross tabulation tables, the cell values were less than five. This was assumed to be due to the small sample of participants in certain categories such as age and gender which is consistent with an inaccurate chi-square estimation and p value (Campbell, 2007). The chi-square statistic is an approximation and is therefore more prone to error with smaller sample sizes (Freeman & Campbell, 2007). Fishers exact was purported to be a more appropriate test for independence when using a smaller sample as it calculates exactly the difference of independence (Freeman & Campbell, 2007). Accordingly, the Fisher's exact test of independence was applied for analysis of the cross tabulated variables.

Summary

Within this chapter, the data collection and data analysis processes used in phase 2 of the study were discussed. The population, sample and recruitment processes used were also outlined. The chapter also discussed the administration and data collection processes used for the two questionnaires and the statistical analysis techniques employed to describe the data.