A Quantitative Research Critique

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The article "Stress in emergency departments: experiences of nurses and doctors" is authored by Sonya Healy and Mark Tyrrell. It is a study on the acute stress that health care providers endure on a daily basis in the emergency department, and how this stress can be anticipated and managed. The study concludes that a very high percentage of health care professionals do indeed suffer from acute stress in the emergency department, mainly from the work environment itself and aggression/violence from the patient and patient family, and the authors recommend hospital administrations to properly recognize and manage the effects of stress.

 In the findings section of the study, the authors gave an overview of various existing studies on acute stress suffered by health care professionals who work in the emergency department. "ED's are high-stress environments and the repeated exposure of ED staff to stressful events such as sudden death, trauma, patients in pain, resuscitation, aggression and violence can have devastating effects on their physical, psychological and emotional health and wellbeing, and can reduce the quality of their working lives." (Stress, 2011). The authors have clearly demonstrated the existence of the problem by citing all the existing studies on this issue and the necessity for further research on the issue in order to better prevent and manage the problem. Because the authors used a descriptive-survey method in this study, no independent variable was used. The dependent variable was the nurses and doctors who worked in three separate ED's in Ireland. The result of this research will no doubt have great significance because stress in the ED is a problem that all nurses and doctors have to deal with all around the world.

 As mentioned earlier, the authors used a descriptive-survey design for their study because it is the most appropriate for the purpose of the research. The purpose of descriptive studies is to observe, describe, and document aspects of a situation (Nursing Research, 2013, p. 160). In this study, the authors are not trying to come up with a solution for the problem of stress in the EDs. Instead, they are trying to learn more about the issue. Thus, they devised a questionnaire designed to gather data on the stress suffered by nurses and doctors. The questionnaire was sent to 150 ED nurses and doctors working in three EDs in Ireland. There was a 69 per cent (*n*=13) response rate and a non-probability convenience sample of nurses (*n*=90) and doctors (*n*=13) was made (Stress, 2011). As a result, the data collected is cross-sectional because it is collected at one point in time. However, the nature of the data pool in this study may have adverse effects on the validity of the results. According to the text book, there are four aspects of a study's validity: (1) statistical conclusion validity; (2) internal validity; (3) external validity; and (4) construct validity (Nursing Research, 2013, p.167). One of the most direct way to test statistical conclusion validity is statistical power, which is essentially to have a large enough sample. In this study, the authors only sent their questionnaire to 150 nurses and doctors working in three EDs in Ireland. Both the small number of participants and the lack of geographic diversity would affect the statistical conclusion validity because nurses and doctors working in EDs in other areas of the world may have different work experiences and stress levels, which would obviously yield different results. For these exact same reasons, the external validity of this study is also questionable. By keeping the data sample limited to only Ireland and only 150 nurses/doctors, the authors cannot guarantee the results of their study would be the same if the study was to be replicated in other parts of the world. However, because the participants in the study are homogenous (they are all in Ireland), defined by the text book as only people who are similar with respect to confounding variables are included in the study (Nursing Research, 2013, p. 165). The internal validity for this study is relative high because there is not enough diversity among the participants to create any of the possible threats. There is no issue with construct validity in this study because the questionnaire devised by the authors was very specific to the purpose of the study. Furthermore, there is no way to identify the reliability of this design because each participant only took the questionnaire once. Reliability relates to the consistency of a measure. A participant completing an instrument meant to measure motivation should have approximately the same responses each time the test is completed (Validity 2015). In the instant case, no participant took the same questionnaire more than once, and thus no data exists to measure the reliability of the design.

 Although not expressly stated in their research, the target population was obviously any nurse and doctor who worked in EDs, and as a result, there wasn't much of an eligibility criterion for the population. However, for reasons unexplained in the research article, the authors chose to collect data from three EDs in Ireland and from nowhere else. Authors did not state this was the only accessible population to them, thus the limited sampling of the overall population in this case may lead to a sampling bias as it does not take into account of the different EDs in other parts of the world, and the different reaction to stress experienced by those nurses and doctors. Based on their description of how the data was collected, it is clear that the authors conducted a nonprobability sampling, specifically, a convenience sampling, which is defined in the textbook as selecting the most conveniently available people as participants. Convenience sampling is the weakest forms of sampling, but it is also the most commonly used sampling method in many disciplines (Nursing Research, 2013, p. 178). Thus, the authors could have used much better methods in sampling, such as a probability sampling by selecting random ED's throughout the world in order to minimize the sampling bias. The problem with the sampling in this research is worsened by the fact that only 150 nurses and doctors were polled with a questionnaire. Considering the fact that the target population in this research is all the nurses and doctors working in EDs in the whole world, 150 participants seems to be insufficient sample size under the power analysis. Power is the probability of detecting an effect, given that the effect is really there. It is the probability of rejecting the null hypothesis when it is fact false. The most common use of the power analysis is to determine the necessary number of subjects needed to detect an effect of a given size (Introduction to SAS). In another words, the number of participants in this research must be sufficiently high in order for the power (or probability) of the result to be valid. This also has important effect on the statistical conclusion validity discussed earlier.

 As mentioned, the authors used a self-report method to collect their data, in the form of a questionnaire with close ended questions. For the purpose of this research, this method is the best form of data collection because the authors are trying to learn more the problems associated with stress working in ED’s. As a result, the authors chose to use a descriptive-survey method for their research, and a questionnaire was the most efficient means of collecting the data because it’s cost effective and a larger part of the population can be sampled in a less time consuming manner. In addition, there are many qualitative questions built into the questionnaire, which can then be transformed into quantitative data via scale. “Most data that are analyzed quantitatively actually begin as qualitative data. If a researcher asked respondents if they have been severely depressed, moderately depressed, somewhat depressed, or not at all depressed in the past week, they answer in words, not numbers. The words are transformed, through coding, into quantitative categories.” (Nursing Research, 2013, p.184). This is exactly what the authors have done in this research by setting up questions such as the adequacy of support for stress at work, on a scale of 1 to 5 (1 being never and 5 being very frequent). This is then translated into valuable quantitative data later on.

Although the researchers provided demographic information on the test sample, such as the age, education level, and work age of the respondents, in an attempt to reinforce the validity and reliability of the data, they forget that the overall test sample was limited to doctors and nurses working in the three ED’s in Ireland. Differences in local culture may have drastic different effects on those who work in ED’s and thus these results from the questionnaire may be similarly duplicated across the world. Thus, reliability may be a big problem for this research. There was no mention of an intervention in the article and very little information was given on how the responses to the questionnaire was actually gathered. The article only states that the questionnaire was sent to 150 doctors and nurses working in the three ED’s and then it proceeded to discuss the data collected from the responses. This may potentially raise bias concerns in the collection of the data.

Based on the nature of this research and the data chart created by the authors, it is clear that the authors used descriptive statistics to analyze the data. Descriptive statistics is a statistical method commonly used to describe the basic features in a study by providing simple summaries about the sample and the measures. This method is typically distinguished from inferential statistics, which attempts to draw conclusions about the sample population using probability of law (Descriptive Statistics, 2006). In Box 1 of the article, the authors created a list of stressful events and sorted the list based on the number of respondents who thought the event was the most stressful for them. This is a classical frequency distribution chart used in descriptive statistics, where the numerical data is organized in a certain manner in order to may analysis more efficient. However, despite the fact that the authors used the appropriate statistical method to analyze the data, they failed to show proper support for their hypotheses. The authors stated at the beginning of their article that they believe “While a certain amount of stress can motivate staff and ensure that they focus on the tasks at hand, repeated exposure to stressful events can affect them adversely.” (Stress, 2011). After examining both the questionnaire and the data (frequency distribution table – Box 1), there is nothing to indicate the “adverse” effects that the authors hypothesized. The data strongly proves both doctors and nurses who work in ED’s suffer stress as a result of various events at work. However, the data fails to show how the stress has adversely affected their lives, such loss of sleep, poor job performance, inability to carry out one’s duty etc. In another words, the authors only proved half of their hypothesis, that doctors and nurses who work in ED’s suffer from work related stress, but they failed to provide any evidence that this stress negatively impacted lives of said doctors and nurses.

The authors also used relational statistics to test for statistical significance between demographic characteristics of the sample and a number of stress variables. Statistical significance is important in the context of testing a hypothesis using the normal distribution and the p value, which is defined as probability of observing results at least as extreme as those measured when the null hypothesis is true (Statistical Significance Explained, 2018). In the article, the authors presented data to show whether the respondents’ age and number of years worked in the ED had any significance on the particular stress events. Ultimately, the authors concluded that there is no statistical significance on the respondents’ demographic backgrounds. However, the authors failed to show any data on the statistical significance of the overall hypothesis, which is work-related stress at ED’s have adversely effects on doctors and nurses who work at ED’s. Furthermore, the authors did not provide any information on the effect size of the data, which is defined as a simple way of quantifying the difference between two groups that has many advantages over the use of tests of statistical significance alone (It’s the Effect Size, 2002). The authors listed multiple stressor events and indicated the number of respondents for each event, but they did not provide any statistical analysis on the relationship between the events individually.

Over all, this research article was not very helpful based on the data that was collected and the way the data was analyzed. First, there is a big problem with the statistical validity of the data because all 150 of the respondents selected for the questionnaire all worked in ED’s based in Ireland. For a research whose results are meant to be applicable to all doctors and nurses who work in ED’s around the world, the sample pool seems to be too limited in terms of its demographics and thus potentially biased. Differences in local cultures may have drastic effect on the data. For a descriptive-based method, this significant bias in its sample pool may call into question the overall validity of the data. In addition, the authors failed to present data that would support the entirety of their hypothesis. Their hypothesis was simple: doctors and nurses who work in ED’s suffer from work-related stresses, which in turn has adverse effects on their lives. Although the authors talked about the type of adverse effects stress may have on people towards the beginning of the article, the questionnaire fails to ask the respondents how the work-related stress actually effects their lives. In another word, the data collected only establishes the first half of the hypothesis, that these doctors and nurses who work in ED do indeed suffer from work-related stress due to certain stressor events. However, the data is silent on how said stress negatively impacts them. As a result, this article may not be able to convince the appropriate administrations to take the necessary preventative measures against the work-related stress as it suggests in its conclusion.

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