



A Multi-Dimensional Study On The Relationship Of Emotional Intelligence To The Multitasking Ability Of Nursing Students: A Structural Equation Modeling Approach

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Abstract: With the gradual shift of nursing practices to a more emotional and open practice, there is now a need to evaluate the connection and interaction between emotional intelligence & nursing work. Emotional Intelligence is the ability to cope up with the external pressures and demands. Nursing work is heavy on cognitive demands because it is unpredictable and fast-paced. The act of multitasking is present in this context and is defined as the ability to achieve/execute multiple goals in the same period with frequent switches among tasks. Past studies failed to consider the interaction of all four components of emotional intelligence with the multitasking ability of a person.

Key Words: Emotional Intelligence; Multitasking; Cognitive work ability; Emotional Competence Inventory 2.0; Nurses

1. INTRODUCTION

Nurses are key people and the majority in the healthcare industry. Nursing work requires heavy demands on both cognitive and emotional resources. Traditional practice is that the nurses should conceal emotions from their patients to provide a barrier of professionalism, but as time passes, nurse practice gradually allows them to be emotionally connected to the patient for it comforts the patient during their stay (McQueen, 2003). With the gradual shift of nursing practices to a more emotional and open practice, there is now a need to evaluate the connection and interaction between emotional intelligence and nursing work, this is to be able to understand the behavior of emotions in nursing work. Goleman has identified Emotional

Quotient, a measure of Emotional Intelligence as the factor that can be used to understand one's emotional ability. Emotional Intelligence is the ability to cope up with the external pressures and demands. This can be influenced by the combination of one's non-cognitive skills, capabilities, and competencies (Martinez, 1997). Emotional Intelligence is composed of four dimensions: self-awareness, self-regulation, empathy and social skills (Goleman, 1996). Other known words used to describe some dimensions are: self-management as self-regulation, social awareness as empathy and relationship management as social skills. Earlier studies have coined emotional intelligence as a form of social intelligence that involves the ability of a person to monitor their own feelings and other people's feelings and emotions, to screen them and to utilize this information as guide

in executing action (Mayer & Salovey, 1990). Years after, Goleman showed interest in the works of Mayer & Salovey that he researched and published books on Emotional Intelligence, and he defined emotional intelligence to 4 main dimensions; self-awareness, self-regulation, empathy and social skills (Goleman, 1996). This is the popular definition of emotional intelligence up to date. Many succeeding studies on emotional intelligence have revolved around Goleman 4 dimensions of Emotional Intelligence and have been an applied to different sector such as healthcare and education (McQueen, 2003; Evans and Allen, 2002).

On the other hand, nursing work is heavy on physical and cognitive demands and failure to meet these demands can cause patient deaths. One area that nursing work is demanding is working in the intensive care unit (ICU). In this area the nurses are required to monitor and react to any shifts and changes of vital signs of the marginalized patient. In the Philippines, the nurse-to-patient ratio in the intensive care unit (ICU) can range from 1:3 to 1:20 (Rustia, 2012). Due to the low nurse-to-patient ratio in the ICU, the nurse are forced to switch from 3 to 20 patients, monitoring and attending to their vital signs. The act of multitasking is present in this context and is defined as the ability to achieve/execute multiple goals in the same period with frequent switches among tasks (Delbridge, 2000). In context, the multiple goals would be keeping the multiple patients alive for their whole stay in the hospital and the frequent switches would be the reaction of the nurse towards the shifts of individual vital signs of each patient. Past studies have dealt with the measurement of working ability in the context of nurses (Rustia & Seva, 2011; Rustia 2012). The cognitive work ability (CWA) concept established by Rustia & Seva (2011) is defined as the ability of a person to accomplish mentally demanding task effectively and efficiently. This concept was applied specifically to nurses in order to address the nursing errors due to heavy mental and cognitive workload. The cognitive workload definition and context is parallel to Delbridge's definition of multitasking in the context of nurses in the sense that the mentally demanding task of cognitive work ability is the multiple tasks present in multitasking.

The introduction should give a brief background of the study, describe relevant developments in the literature to date, and describe the objectives and scope of the study. Indent paragraphs by 0.5-inch.

1.1 Conceptual Framework

Given the gaps found in current studies on the Emotional Intelligence and Multitasking, our conceptual framework will serve as a bridge in connecting the Multitasking and Emotional Intelligence by connecting each component of Emotional Intelligence to Multitasking and seeing its effect on Performance Quality. Performance quality is based on the good decision making of a person, in the context of nurses it is how fast and accurate they handle the needs of the patients.

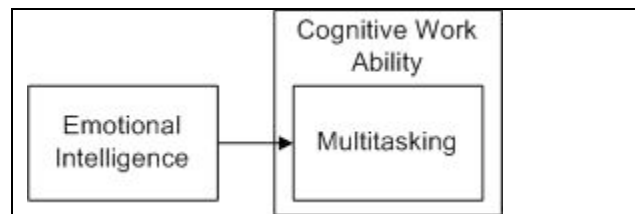


Fig. 1. Conceptual Framework

Fig. 1 proposes that emotional intelligence has an effect on nurses multitasking performance. In this relationship, the interactions of all components of emotional intelligence will be tested against multitasking and its components of perception, working memory, attentive resource and responsiveness. Rustia & Seva (2011) study on the cognitive work ability will serve as a measure of the multitasking ability of the participants. Figure 2 showed a detailed conceptual framework as shown below.

1.2. Statement of Hypothesis

Intact with the objectives of this study, the following hypotheses are based on the conceptual framework and it will serve as initial understanding of the study;

Hypothesis 1: There is a relationship between a person's Emotional Intelligence and Multitasking Ability.

Maher et al.'s (2010) study on the integration of one's emotional state to engagement

index, an index that measures one capability of cognition has proven that there is a positive relationship between one's emotional states to cognition. This research has stated that cognition and emotion are highly linked and impact each other.

Another finding by Aneja (2005) has found that as a person conditions or trains oneself to manage emotions then this promotes efficient cognition. This condition bring self-consciousness and control to one's switching ability thus giving one a better chance for efficient cognition. As one develops that learned capability a well balance Emotional Quotient can also be attained. Earning a good emotional intelligence quotient is by having a well balance level of emotional competence per dimension. This is also done through proper regulation of one's self (Goleman, 1996). Through these researches and inspiration to test a relationship between multitasking performances, considering attention and working memory and emotional intelligence was yielded.

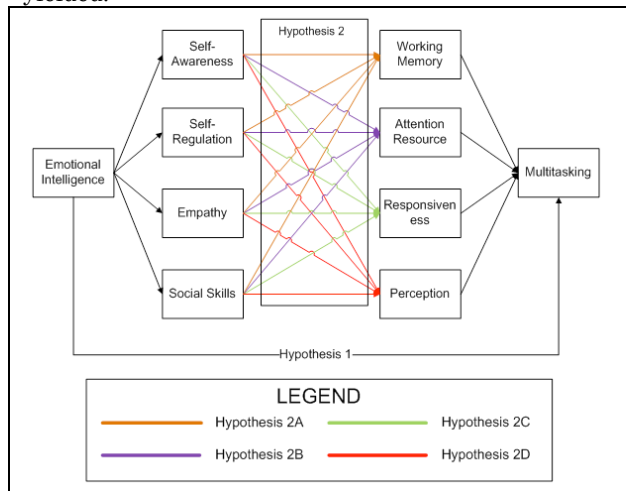


Fig. 2 Details of Conceptual Framework

Hypothesis 2: Emotional Intelligence components have multiple interactions effects on multitasking.

Many studies have taken into account taking individual components of emotional intelligence and relating it to multitasking. Ratan, Santa Cruz & Vorderer (2007) has established a relationship between self-awareness and multitasking through the use of video games. Ismail & Sharma (2012) has made a relationship between self-regulation and multitasking on how they manage cognitive and emotional processes towards a certain

goal. Lietz, et al (2011) related empathy and multitasking by dealing with how people juggle stress in social work settings. Lastly, Lieberman & Rosenthal (2000) recognized the relationship of social skills and multitasking by categorizing people to introverts and extrovert and seeing how they perform in multitasking task and it was found that there was a significant difference with the introverts and extroverts in terms of multitasking performance. Given that the components of emotional intelligence have been individually and independently related to multitasking, there has yet to be a research to see how multiple interactions of the components affect multitasking.

Hypothesis 2A: Emotional Intelligence components have multiple interactions effects on Working Memory.

Studies on working memory (Konig et al, 2005; Deprez et al, 2013; Meyer and Kieras, 1997) support our hypothesis that a well-functioning working memory can enhance and contributes to one's multitasking ability. Working memory is the cognitive system that allows the storage, retrieval and processing of information to be able to execute task by externally driven stimuli (Konig et al, 2005). Working memory also assist an individual when switching from multiple tasks, working memory stores the information in the current task and diverts attention to the next task (Meyer and Kieras, 1997).

Hypothesis 2B: Emotional Intelligence components have multiple interactions effects on Attentive Resource.

A study conducted by Malterer et al (2008) on the psychopaths supports our hypothesis that there is a relationship between emotional intelligence and proper attention allocation. This study defines emotional intelligence and relates it to cognitive measures by the following; the ability to repair one's current emotion, the clarity in making distinguishing affective emotional state, and lastly the ability to allocate attention to one's current emotion. Experimental test show that these psychopaths have lower levels of emotional intelligence. Further tests show that psychopaths with low emotional intelligence have deficits in attention allocation for both emotional and information processes. This study also shows that having low emotional intelligence has difficulty in switching attention from one stimulus to another (Malterer et al., 2008).

Hypothesis 2C: Emotional Intelligence components have multiple interactions effects on Responsiveness.



Responsiveness is how fast a person react or responses tasks. This is measured through getting the response time of the respondents in doing the task. There is to believe a relationship between emotional intelligence and responsiveness because both require attention resource (Rustia, 2012).

Hypothesis 2D: Emotional Intelligence components have multiple interactions effects on Perception.

Perception is the awareness of the complexity of stimuli and the how information is retrieved from stored memory and is interpreted by the respondent (Fisk, et al., 2006). The most common perceptive task among nurses is visual search and attention needed in executing the task. Just like responsiveness, perception and emotional intelligence both require attention. (Wickens & Holland, 2000).

2. METHODOLOGY

The sample population consists of 25 junior and senior nursing students with age ranges from 18-22 years old practicing or doing duty in hospitals and have knowledge about physician's order (PO). The experiment consists of two parts: the assessment of Emotional Intelligence through Emotional Competence Inventory 2.0 and the assessment of Multitasking Ability through playing the simulation game CASNUR. Each participant took the Emotional Competence Inventory (ECI) 2.0 test in order to measure their Emotional Quotient, measure of Emotional Intelligence, and it's components; also two (2) of their co-workers rated the participant in order to verify if the self-assessment of the participant was accurate. CASNUR is a game developed that simulates an intensive care unit emergency case wherein there is a patient that is under critical condition and is used to measure cognitive work ability (Rustia, 2012.). In the simulation, the vital sign of the patients will change over time. In the duration of the simulation, the subjects will be observed and recorded through a camera to gather data about their mental performance during the game. At the same time, their attention, working memory, perception, reaction time and response accuracy will be measured. The game lasts for 15 minutes. CASNUR's objective is to measure the Cognitive Work Ability of nurses by collecting the performance metrics from the game. The usage of such simulation game will help produce valid and unbiased data about the performance of the subjects. This program is replicated on to 3 or more computers

to be able to simulate the actual nurse to patient ratios and to be able to simulate the multitasking. The participants are also using an eye-tracker to track the movement of their eyes. After obtaining the results from the experiment, SmartPLS software was used to conduct the Structural Equation Modeling Analysis which can analyze causal relationships between observed and latent variables.

3. RESULTS AND DISCUSSION

3.1. *Structural Equation Modelling: Model Measurement*

Structural Equation Modeling (SEM), being part of the second generation of multivariate method, is chosen as the statistical tool for this research because it has the ability of evaluating model construct relationships simultaneously unlike in regression where variables has to be analyzed separately. With the help of SmartPLS, structural equation modeling analysis can now be done.

Hypothesis 1: There is a relationship between a person's Emotional Intelligence and Multitasking Ability.

After gathering the 25 nursing student participants and conducting the experiment, data was extracted and served as input to the Smart PLS program. From there, final results were yielded. Below are the final model with final parameters: Coefficient of determination and Inner path coefficient.

The coefficient of determination is the percent contribution to variance of the independent variable (Emotional Intelligence) to the dependent variable (Multitasking). As seen from figure 3.1, the Emotional Intelligence explains only 14.8% of the variance of Multitasking. It means that 14.8 % percent of the variation in the dependent variable (*Multitasking*) is reduced by taking into account the independent variable (Emotional Intelligence). Usually, in studies that involve human behavior and abilities, it has been historically proven that getting high r-squared values is very hard to achieve because humans are simply hard to predict but as long as other parameters are proven statistically significant, then it can be concluded that the relationship is still significant (Frost, 2013).

The inner path coefficients are the values between two latent variables. The coefficient will indicate the significance of the relationship between the two latent variables. The relationship will be

considered statistically significant when the inner path coefficient is greater than 0.1. From Figure 3.1, the path coefficient of emotional intelligence and multitasking is 0.385, the model suggests that the

hypothesized path relationship between Emotional Intelligence and Multitasking is statistically significant thus can be concluded that emotional intelligence can be a strong predictor of multitasking.

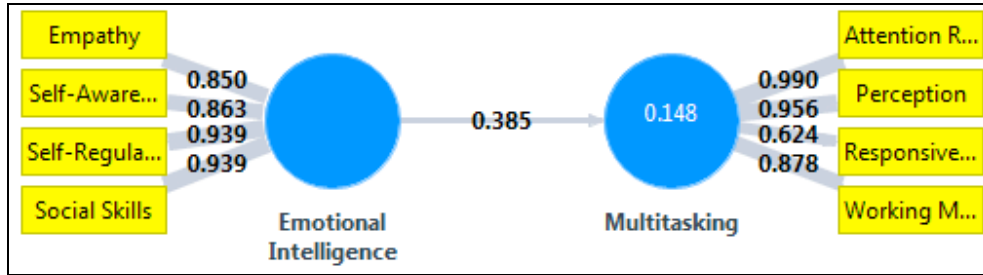


Fig. 3. Path Model Results for Hypothesis 1

Hypothesis 2: Emotional Intelligence components have interaction effects on multitasking.

Hypothesis 2A: Emotional Intelligence components have interaction effects on Working Memory.

Hypothesis 2B: Emotional Intelligence components have interaction effects on Attentive Resource.

Hypothesis 2C: Emotional Intelligence components have interaction effects on Responsiveness.

Hypothesis 2D: Emotional Intelligence components have interaction effects on Perception.

Below are the final model with final parameters; Coefficient of determination and Inner path coefficient.

Analysis on path coefficients (β) and T-statistics was used as tools to validate the hypotheses. As mentioned, path coefficients measure the significance of a relationship and relative effects of variables within the fitted equation model. For a path coefficient to be considered as significant, the value has to be at least 0.1. On the other hand, T-statistics is a single measure or a numerical summary of a data-set used to validate any hypothesis. With a confidence level of 95%, the t-value that has to be exceeded in order to reject the null hypotheses is 1.96 based from the rule of thumb of bootstrapping function.

The main hypothesis of this study, Hypothesis 1, was proved to be significant as seen in the table above. The path coefficient of 0.385 is strong enough and the t-statistic is greater than 1.96.

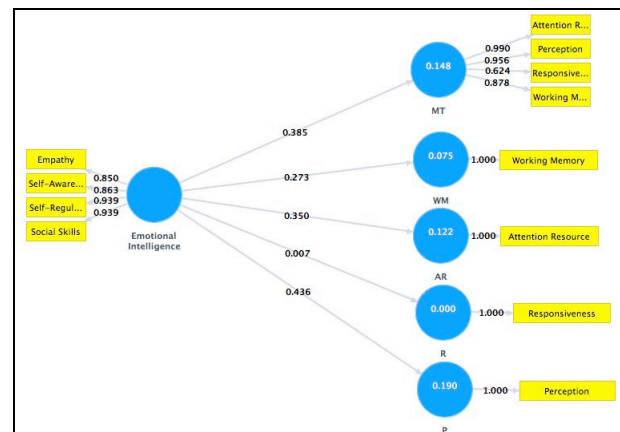


Fig. 4. Path Model Results for Hypothesis 2, 2A, 2B, 2C, 2D

It means that Emotional Intelligence is a valid and reliable predictor of the Multitasking Ability of a person. Hypothesis 2 was also proved to be significant. Among all the sub hypotheses of 2, Hypothesis 2C was the only one whose significance is rejected. The path coefficient and t-statistic is too low and far from the minimum required values before being considered as significant.

4. CONCLUSION

A job of a nurse is very vital in hospitals and clinics because they are professionally trained to take care of sick and infirm people. It is a profession that impacts the health and life of a patient. Errors in this nature of work can yield major consequences. Although there is high skill and competency needed in the field of nursing, dealing and interacting with



patients, doctors and coworkers, is another skill they need to learn. It is useful in the practice of nursing if nurses are trained and thought to have the ability to manage one's own emotions and recognize other's (Landa & López-Zafra, 2010).

The relevance of the structural equation modelling is that it allows the analysis of dependency of multiple variables, to be able to establish simultaneous multiple relationships. Structural equation modelling also enables us to define variables that are implicitly measured by relating measureable indicators to it. This makes SEM a powerful statistical tool in analyzing non-cognitive variables and behavioral variables.

The two main hypotheses of the study were proven by the results of the experiment. One is that there is a relationship between a person's Emotional Intelligence and Multitasking Ability this was proven through the path coefficient of the Emotional Intelligence to Multitasking which is 0.385, this shows that a significant positive relationship; this path's t-value is 1.973 and satisfies the 95% confidence interval. Another is that Emotional Intelligence components have interactions effects on multitasking and its components, working memory, attentive resource, responsiveness and perception. The model also outputs the coefficient of determination, the percent contribution to emotional intelligence as a predictor. The path of Emotional Intelligence to Multitasking has proven this but to further prove it for each component of multitasking, paths were created for each component. The components of multitasking that have a significant interaction effects with Emotional Intelligence are Working Memory, Attentive Resource and Perception which had path coefficients of 0.273, 0.350 and 0.436 respectively. Responsiveness is the only component, which didn't have a significant path coefficient that is above 0.1.

After simultaneously evaluating the interaction effects of the components of Emotional Intelligence to Multitasking, this study has proven that there is a significant link between Emotional Intelligence and Multitasking in the context of nurses. Based from the results of the structural equation modeling in SmartPLS, it can be concluded that the model is valid, reliable, and that Emotional Intelligence is a good predictor of Multitasking ability of nurses. The interaction of the components of Emotional Intelligence was found to have statistically significant effect on Attentive Resource and Perception. Then, the interaction of the

components of Emotional Intelligence was found to have an effect on Working Memory but was not proven significant. Lastly, the interaction of the components of Emotional Intelligence almost showed no effect and significance on the Responsiveness. The reason behind the insignificance of emotional intelligence to responsiveness is that the nurses use emotional intelligence in prioritizing these actions as shown by the relation of emotional intelligence to perception and attention resource.

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