The impact of task characteristics on the performance of nursing teams

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Abstract

Purpose: This study sought to examine the relationship between team task features and team task performance. Team task performance revolved around the team's technical knowledge and the technical core activities of the organization. On the other hand, team task characteristics include task identity, task significance, and task interdependence.

Methods: This study involved a total of 300 nursing teams (1436 individual nurses) from seven state hospitals in Peninsular Malaysia. Data were collected using two sets of questionnaires which were initially distributed to 320 teams. One set was given to the team members and another set was given to the team leaders. Of the 320 sets sent out, 300 sets were returned. Responses were then combined and aggregated to the team level to get the team's final score. Analyses of the hypotheses were done using Partial Least Squares (PLS) through assessment of the measurement and structural model.

Results: Results from the path analysis revealed that of the three dimensions of team task attributes, only task significance was positively and significantly related to team task performance ($\beta = 0.076, P > 0.05$), while task identity ($\beta = 0.076, P > 0.05$) and task interdependence ($\beta = -0.037, P > 0.05$) were found unrelated to team task performance.

Conclusions: This study demonstrated that task significance is important to predict team task performance. Task significance reflects meaningfulness and nobility of tasks, thus elevate the desire to perform better in each assigned task.

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1. Introduction

Nursing teams are important in ensuring positive health outcomes of patients. The utilization of teams, especially among nurses is advantageous as their tasks are becoming highly interdependent and unpredictable. Effective nursing teams produce greater quality of care, fewer errors, and more satisfied patients. In teams, nurses deliver safe care that affects not only patients' health but also patients' emotions. To ensure smooth operation of everyday tasks, nursing teams must always respond effectively to recurring tasks and situations among which are medication administration, patients' documentation, patients' health assessment, and team supervisions. Effective accomplishments of nursing tasks will impact the overall quality of care, the well-being of patients and the continuous achievement of the teams' task performance.

This paper analyzes the relationship between team task characteristics and team task performance among nursing teams in Malaysia. Team task performance is conceptualized as the team's technical knowledge and the technical core activities of the organization. Team task characteristics are operationalized as task identity, task significance, and task interdependence.

1.1. The imperatives of team task performance

Team task performance is established through the team's technical knowledge and learning orientation [1]. It deals with activities that contribute to an organization's technical core which are technological process, provision of materials, or provision services. Team task performance varies across jobs and it is role-prescribed. Its antecedents are more likely to involve cognitive ability than personality variables [1]. There are two classes of behavior included in task performance at an individual level [2].
The first class characterizes the activities that directly transform raw materials to goods and services that an organization produces. The second class contains activities that service and maintain the technical core by furnishing the supply of raw materials; distribute end products; and provide planning, coordination, and staffing functions (including supervising) to enable effective functioning of the technical core [2].

Team task performance is established by accomplishing a team’s technical knowledge and learning orientation [3]. Although it does not necessarily require interdependent interactions between the team members [4], the teammates must still be aware of each other’s technical capabilities to facilitate achieving the team’s mission. Salas, Sims, and Burke [5] posited that team task performance requires an effective coordination between team tasks, tools, machines, and systems involved, suggesting that in achieving greater performance, the skills of the team members must be effectively coordinated with tasks at hand.

In nursing teams, team task performance is reflected through the full understanding of patients’ clinical information [6]. High understanding of clinical and technical knowledge will influence how the team reacts during critical incidents [6]. With sufficient knowledge on assigned tasks, high performance teams will have less duplication of work and are able to locate resources efficiently [7]. In definition, a good management of task will reflect a high pursuit of task performance among nursing teams.

1.2. The impact of team task characteristics on team task performance

Many earlier studies have documented the positive influence of team task characteristics on team performance. The way team tasks are designed affect the performance of a team and team tasks not only positively navigate the team towards greater performance, but also bring notable impact on how teams execute their missions. The following sub-section discusses the three main task characteristics focused in this paper.

1.2.1. Task identity

Task identity allows team members to take charge of their tasks because they are allowed to finish a task from beginning to its end [8]. Although one study found a relation between this component and team performance [9], other studies found otherwise [10]. Identity is important because members who identify with a team are more likely to perform better than those who do not [11]. Task identity is illustrated through the accomplishment of a whole piece of work. The team’s sense of worth is achieved through completing a whole task rather than through contributing selective efforts to certain parts of an assigned task [10]. To successfully complete a whole piece of work, members’ knowledge and expertise need to be fully utilized. Team task identity is achieved when team members collectively finish a specific duty. Based on the aforementioned discussion, a positive relationship between task identity and task performance can be expected. Thus, the following hypothesis is put forth:

Hypothesis 1. Task identity has a positive relationship with task performance.

1.2.2. Task significance

Besides task identity, task significance has been found to affect team performance. Task significance creates meanings to team tasks and will in turn increase performance. Specifically, the extent of significance created by a task will induce a sense of “experienced meaningfulness”, which in turn, will encourage high internal work motivation, high quality work performance, high satisfaction with work, low absenteeism, and low turnover [8]. Campion et al. [10] revealed that task significance positively relates to team performance because the tasks carried out by a team will have an impact onto other people’s life. Task significance will motivate members to successfully perform tasks and thus, will create higher passion for performance. In addition, Grant [12] advocated that task significance has a strong influence on team performance because it increases employees’ perception that their jobs are meaningful to others. In particular, this particular component shapes the behaviors of team members and will eventually increase team performance following a successful team decision-making process [12,13].

Nursing, being an organized skilled activity [14], requires nurses to work together in teams to deliver quality care [15]. Nursing care is said to have quality when it is holistic and carried out in a consistent manner and that it meets the individual needs of patients [15]. Nursing team members have an impact on the quality of healthcare because they deal with patients on a regular basis. Through task significance, nurses will feel that their tasks give meaning to others when it is appreciated. In fact, the tasks of a nursing team are not only significant to the patients, but also to the hospital and public at large.

In a nutshell, the positive impression that team members have with regards to their significance will provide the essential psychological cues that what they do is important and meaningful. This will trigger greater energy to achieve team performance [12]. Team tasks that have significance will lead to higher members’ satisfaction and stronger sense of teamwork. Campion et al. [16] discovered that tasks significance relates positively with multiple team performance criteria such as productivity and satisfaction. In light of these findings, it is proposed that task significance will have a positive relationship with task performance. Thus, it is posited that:

Hypothesis 2. Task significance has a positive relationship with task performance.

1.2.3. Task interdependence

Task interdependence, which is a component of team task, is a group-level construct that increases along with members’ dependence on the team [16]. In most cases, high task interdependence has a significant influence on team performance because there is a need for team members to coordinate and interact during missions. In addition, high task interdependence will also increase teamwork that is needed to complete a task. In nursing teams, this clearly indicates the synchronization of work flow and communication in delivering safe care to patients. When task interdependence is high, the success of the team will be dependent upon the smooth flow of team resources, materials, and information, and dependability of the teammates to work together [16].

Task interdependence is very important in nursing teams as the way members share and rely on each other to complete tasks will enable the team to achieve greater performance. Nursing tasks such as administering medications, wounds, and interpretation of patient information often requires nurses to work with others in order to coordinate care [17]. Therefore, as frontliners of healthcare, nursing members are responsible to not only understand their own scope of practice but must also be well-informed of other members’ nature of duties [18]. Nursing team members must be aware of the responsibilities of others, while also having enough reliance on other nursing members, as this will ensure that nursing tasks are delivered effectively. Hence, we suggest the following hypothesis:

Hypothesis 3. Task interdependence has a positive relationship with task performance.
2. Methods

This study examined the relationship between team task characteristics and team performance. Data was collected at the team level, and aggregation of score was done. Self-administered questionnaires were distributed to team leaders and team members in a non-fixed setting, with minimal contact between respondents and the researcher.

2.1. Study design and sample

This study was conducted cross-sectionally among nursing teams located in hospitals in Peninsular Malaysia. Totally 300 nursing teams were involved consisting of 1436 individual nurses. Data were aggregated at the team level following Jayasingam, Ansari, and Jantan [19]. This was done by combining team members' scores to represent the team's total score. All individual responses were checked for their level of inter-rater agreement using the multi-item estimator (also known as the $r_{WGJ}$ index) as coined by James, Demaree, and Wolf [20]. Data were analyzed using the Structural Equation Modelling (SEM) technique using partial least square analysis by SmartPLS [21].

2.2. Ethical consideration

In terms of protocol procedures, the Malaysian Ministry of Health required all research involving medical personnel to register via National Medical Research Register (NMRR). After successful registration [NMRR-13-1717-1698[IIR]], we then had to obtain individual approval from seven hospitals involved in this study. Their approvals were then submitted via online to NMRR to seek clearance from the Medical Research Ethics Committee (MREC). It took five months for approval to be granted. Following the approval, all hospitals were re-contacted for data collection. Participants were informed of confidentiality and anonymity through written consent forms.

2.3. Measurements

There were four sets of scales used in this study. The scales were adapted and adopted with permission from the original authors. These scales were used to measure team task performance [1], task identity [8], task significance [8], and task interdependence [22].

Specifically, team task performance was measured using five items that reflect these aspects; team members efficiently performing their job duties, using tools and equipment in completing tasks, performing routine maintenance, planning and organizing work, and working safely. Scales constituting these dimensions were adapted from Ref. [1]. The scale was scored on a seven-point Likert scale ranging from (1) strongly disagree to (7) strongly agree. The composite reliability of this scale was 0.949.

Team task characteristics were measured via a seven-point Likert scale ranging from (1) strongly disagree to (7) strongly agree. Team task characteristics include task identity, task significance, and task interdependence. Task identity and task significance scales were adapted from Hackman and Oldham [8] with a total of six items (three items for each characteristic). Task identity measured the extent of which team task is performed as a 'whole', while task significance tested the perceived value and worthiness of the team's daily tasks. The composite reliability for these scales were 0.949 and 0.952, respectively.

The task interdependence instrument consisted of three items describing the interdependency between team members in completing daily tasks. Task interdependence was measured using a seven-point Likert scale (ranging from (1) strongly disagree to (7) strongly agree) which was originally used by Liden et al. [22]. The instrument consisted of three items describing the interdependency between team members in completing daily tasks. The composite reliability for the scale was 0.830.

2.4. Data collection procedure

Data was obtained from nursing teams that consisted of team members and their immediate supervisors. During data collection, 320 sets of self-administered questionnaires were sent out to seven participating hospitals in two sets. One set was completed by the team members, and another set was given to their immediate supervisors. Since the unit of analysis for this study was team, aggregation of data was done to obtain the team's final score. Team members' scores were merged with their immediate supervisors' score and were aggregated. There were minimal contact between the researchers and the participants, following strict hospital guidelines. At the end of two weeks period, the sets of questionnaires were collected for analysis. Of the 320 teams selected for the study, 300 teams returned their responses. Thus, the final sample of the study was 300 teams.

2.5. Data analysis

For the purpose of descriptive data analysis, respondents' demographics and descriptive data such as percentages and frequencies were analyzed using the Statistical Package for Social Science (SPSS) software for Windows. For deeper analysis and hypothesis testing, data was analyzed using the Structural Equation Modelling (SEM) technique using partial least square analysis by SmartPLS [21]. In partial least square analysis, measurement model and structural model were evaluated.

3. Results

Team leaders were mostly females, amounting up to 296 female leaders, representing 98.7% of the leaders' category. The remaining 4 leaders were males, taking up 1.3% of the leaders' category. On average, their age were around 40 years old, with the minimum age being 22 years old, and the maximum age being 60 years old. Among the team leaders, 33.7% were Chief Nurses (Matrons), 63.7% were Staff Nurses, and the remaining 2.7% were Community Nurses. There were also 1136 team members who participated in this study. 97.6% were females nursing members and the remaining 2.4% were males. Their ages were 32.5 years old on average. In terms of nursing position, only 0.7% of the members were Chief Nurses (Matrons). A majority (90.6%) of the sample were Staff Nurses and the remaining 8.7% were Community Nurses. On average, the team leaders have served their hospitals for 10.6 years, while the team members have served their hospitals for 5.9 years.

3.1. Assessment of measurement model

To assess the measurement model, the convergent validity was examined. Examination included indicator loadings, average variance extracted (AVE), and composite reliability (CR).

Based on the results presented in Table 1, all outer loadings of each construct were significant at above 0.70, and the AVE of each construct exceeds the 0.50 cut-off value as recommended by Fornell and Larcker [23] and supported by Hair, Hult, Ringle and Sarstedt [24]. This indicated that the items used in this study had an acceptable level of convergent validity.

Following the examination of convergent validity, the discriminant validity of the measurement model was examined. Discriminant validity assumed that each construct were distinct and
were obtained with 300 cases and 1000 resamples. To test the path coefficients for signiﬁcance, and task interdependence were found to be unrelated to team task performance (r = 0.076, P > 0.05) and 3 (r = −0.037, P > 0.05). Therefore, it can be surmised that hypotheses 1 and 3 were unsupported.

3.3. Predictive relevance (R² and Q² statistics)

An important criteria for assessing the structural model is the R² values of the endogenous variable of the path coefﬁcients. R² values indicate the amount of explained variance of an endogenous latent construct. High R² values reﬂect a higher prediction of a structural model. R² values range from 0 to 1 with 0 representing complete lack of ﬁt and 1 representing a perfect ﬁt [25]. The R² values of the structural model in this study was 0.732 (team task performance) which indicates that the model ﬁts the data for the present study.

The model was also tested for its predictive relevance. Predictive relevance refers to the capability of a structural model to predict the data points of indicators of a construct [24]. Predictive relevancy is represented by the R² values [26,27]. Using the blindfolding procedure, data sets underwent a repetitive process of cross validation up to a point where each data point has been excluded and reestimated [24]. This procedure is only applied to the endogenous constructs of a model and it reveals the quality of a structural equation model [28]. Hair et al. [24] indicated that values of 0.02, 0.15 and 0.35 signify that an exogenous variable has a small, medium or large predictive relevance towards a certain endogenous variable respectively. Based on that, with Q² values of 0.591 (for team task performance), it can be concluded that the structural model of this study has a substantially large predictive relevance.

**4. Discussion**

Team task characteristics in this study refers to three attributes of team task which include task identity, task signiﬁcance, and task interdependence. Team task is an integral part of a team’s performance because team task affects the direction of the team in terms of its coordination and motivation to achieve the teams’ goals.

4.1. Relationship between task identity and team performance

The analysis revealed that team task identity was unrelated to team task performance (β = 0.076, P > 0.05). This finding differs from that of previous studies that included task identity as a predictor of team performance [9,11]. In one study, Garg and Rastogi [9] concluded that task identity positively relates to team performance because task identity allows team members to exert higher level of motivation, which in turn, increases performance (task performance and contextual performance). Task identity, as Garg and Rastogi [9] mentioned, increases team members’ sense of

![Fig. 1. Results of structural model.](Image)

**Table 1**

| Construct               | Item     | Loading | CR   | AVE  |
|-------------------------|----------|---------|------|------|
| Task identity           | Task_1   | 0.928   | 0.949| 0.861|
|                         | Task_2   | 0.931   |      |      |
|                         | Task_3   | 0.924   |      |      |
| Task significance       | Task_4   | 0.889   | 0.952| 0.868|
|                         | Task_5   | 0.923   |      |      |
|                         | Task_6   | 0.981   |      |      |
| Task interdependence    | Task_7   | 0.852   | 0.830| 0.623|
|                         | Task_8   | 0.645   |      |      |
|                         | Task_9   | 0.853   |      |      |
| Team task performance   | Performance_1 | 0.879 | 0.949| 0.787|
|                         | Performance_2 | 0.894 |      |      |
|                         | Performance_3 | 0.898 |      |      |
|                         | Performance_4 | 0.915 |      |      |
|                         | Performance_5 | 0.848 |      |      |

Note: The value in the diagonal is the square root of average variance extracted (AVE) of each construct.

**Table 2**

| Construct              | Task Identity | Task Interdependence | Task Significance | Team Task Performance |
|------------------------|---------------|----------------------|------------------|----------------------|
| Task Identity          | 0.928*        | 0.729                | 0.561            | 0.848                |
| Task Interdependence   | 0.607         | 0.789*               | 0.512            | 0.887*               |
| Task Significance      | 0.729         | 0.716                | 0.932*           | 0.539                |
| Team Task Performance  | 0.561         | 0.512                |                  |                      |

Note: The value in the diagonal is the square root of average variance extracted (AVE) of each construct.

**Table 3**

| Relationship                     | Beta  | t-values |
|----------------------------------|-------|----------|
| Task identity → Team task performance | 0.076 | 1.092    |
| Task significance → Team task performance | 0.1967** | 2.824  |
| Task interdependence → Team task performance | −0.037 | 0.525   |

Note: **P < 0.01.**
worth by allowing them to complete a task from beginning to end. Task identity was also alleged by Solansky [11] as crucial for task completion because team members with higher sense of identity often perform better than those who do not.

The present study, however, failed to associate task identity to team task performance. This result might relate to the work environment of the nursing teams. In terms of team task performance, the tasks carried out by the nursing team members varied according to the members’ assigned responsibilities. Despite their constant working in teams, their tasks differed according to their assigned roles and specialization. For example, in a hospital ward, the nursing team members were assigned specific roles such as medication rounds and vital health assessments duties, such as assessments of blood pressures and body temperatures. Although the team members are required to finish their tasks from start to end as a team, their specific tasks may differ from one team member to another. This causes a variance in the way the tasks were carried out. For this reason, a significant relationship between task identity and team task performance could not be established. Concurring this finding is the work of Harrison and Humphrey [29], who postulated that in a work unit, team members often assume different roles, and although the team members collectively pursue similar objectives, their expectations in terms of performance might differ individually.

4.2. Relationship between task significance and team performance

Results from the path analysis indicated that task significance has a positive and significant relationship with team task performance (β = 0.1967, P < 0.01). In the context of team task performance, nursing task significance elevates the energy and effort to perform a task, which leads to increased team task performance. Nursing tasks are meaningful because the work activities allow nursing teams to deal directly with patients especially through direct patient care, such as health assessments, personal care (bathing and medical dressing), and medication administration. These tasks are central to the effective functioning of medical care because the impact it has on the patients’ well-being would encourage the nursing team members to perform better in a team. This in turn, would heighten the performance of team task. Furthermore, through nursing tasks, nursing team members will feel more meaningful and develop a sense of purpose, which serve to motivate them to exert more energy and effort in accomplishing their tasks. This in turn, would elevate team performance.

The findings of this study correspond to those by Grant [12], who found significant relationship between task significance and team performance. Nursing teams perform various types of tasks that are important to medical care. Routine tasks also include giving medical advice to patients, performing everyday ward rounds, and providing safe care [38]. When team members perceive that their customary tasks are meaningful and provide a positive impact to the excellence of medical care, they will be more motivated to achieve greater team performance. This positive relationship is important to the overall quality of healthcare.

4.3. Relationship between task interdependence and team performance

The path analysis result found no significant relationship between task interdependence and team task performance (β = −0.037, P > 0.05). This can possibly be attributed to the organizational tenure of the nurses involved in this study. On average, the team leaders and team members have served their organizations for more than five years. The mean for organizational tenure was 10.6 years (team leaders) and 5.9 years (team members).

Organizational tenure of more than five years suggested that the nursing teams involved in this study have been working with each other for a relatively long time. According to Huckman, Stats and Upton [30], longer time spent working together signifies team familiarity and customization. Team familiarity, which resulted from shared experience, may have caused the team members to experience task routinization, which allowed them to perform independently in given situations. In other words, although the nurse members have been relying on each other to handle tasks, they are also able to work independently especially in emergency medical situations. Therefore, given the nurse members ability to cope on their own, the relationship between team task interdependence and team task performance may become insignificant.

5. Conclusion

The success of nursing teams are very much dependent on their ability to engage in successful tasks accomplishments that lead to greater team task performance. Despite the fact that task characteristics (in the form of task identity, task significance, and task interdependence) have been postulated as essential in fostering team task performance, only task significance was found to be a dominant task characteristic that enhance task performance. Nursing is a noble profession since the tasks of a nursing team are not only significant to the patients but also to the hospital and the larger public. When nursing team members believe that their tasks are important and meaningful, they will experience higher satisfaction, develop a greater passion for teamwork, and become motivated to exert more energy and effort to achieve superior team performance.

Conflict of interest

The authors have no conflict of interest to declare.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.ijnss.2017.03.009.

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