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Transformational leadership and patient safety in hospital: The roles of safety culture, decision-making capacity, and locus of control

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ABSTRACT

This study examines to make up this significant gap in the existing literature. Using a cross-sectional sample consisting of 240 nurses in the hospitals of Uzbekistan and a structural model, with a random sampling technique by employing explanatory, and causal design was used to test the developed framework. Quantitative data was collected using questionnaires, the survey instruments were distributed by hand among the private and public sector, we find that nurses' perceived safety culture (SC) and decision-making capacity (DMC) act as important mechanisms linking TL to PS. Meanwhile, nurses' perceived locus of control (LC) moderates the effect of TL on SC and DMC in such way that this effect is more salient for nurses with internal LC than for nurses with external LC. This paper examines the contribution, that individuals with high internal LC are more affected by TL, generate and can better develop SC and DMC. The study findings demonstrated the significant role of transformational leadership played in order to improve working conditions and the environment, which helps nurses to create good conditions, relationships with patients and increase patient safety. The theoretical and practical implications of this study are discussed.

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Introduction

Healthcare organizations globally accept protection and quality of patient care. Patient safety (PS) is the primary goal of healthcare organizations (World Health, 2006). However, recent studies suggest that hospitals have been slow in meeting PS goals and inconsistent in implementing safety systems (Longo, Hewett, Ge, & Schubert, 2007). In the landmark report, according to Institute of Medicine (IOM) in the United States annually 98,000 patients are estimated to be expired because of human errors (Kohn, Corrigan, & Donaldson, 1999) and around one million avoidable injuries are caused by medical errors. According to the Canadian Institute for Health Information study (CIHI, 2016), more than 138,000 hospitals in Canada are estimated from 2014 to 2015, approximately 30,000 patients, or one out of every 18 patients, experienced preventive damage that endangered their lives service. Analyses have illustrated the economic costs of adverse events. For example, during 2009 and 2010, the price of adverse events in the direction of Canada's health care system has been valued at around \$1.1 billion (Etchells et al., 2012). Pressures of the economic costs affect developing countries more seriously on account of their limited health budgets. Researchers have connected patient safety to the quality of nursing work environments and lack of successful leadership (Aiken, Clarke, Sloane, Sochalski, & Silber, 2002); (IOM. & Page, 2004). This is reasonable as nurses contact and provide service to patients directly (Henneman & Gawlinski, 2004). Any human may make mistakes and nurses are not the exceptions. The working environment, in particular the absence of appropriate leadership styles, may be a more fundamental factor in causing the unwelcomed patient outcomes (Aiken et al., 2002). Organizational literature of transformational leadership (TL) has been linked to reduce adverse patient outcomes (Cummings et al., 2010).

Several studies, however, have investigated the mechanisms through which leadership influences employee behavior and subsequent implications on PS outcomes (Wong, Cummings, & Ducharme, 2013), emphasize the role of leaders in creating a culture of safety (Merrill, 2015; Wagner et al., 2018; Wong et al., 2013). (McFadden, Henagan, & Gowen Iii, 2009) have identified that the TL was directly related to the culture of patient safety and indirectly related to patient safety outcomes through culture and patient safety programs, such as education and training. Individuals with large sense of TL attitudes have a significant and beneficial impact on

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safe workplace cultures (Weng, Huang, Chen, & Chang, 2015), and it supports an effective SC through empowerment, encouragement and agility of workforce (Armellino, Quinn Griffin, & Fitzpatrick, 2010); (Armstrong, Laschinger, & Wong, 2009; Spence Laschinger, Wong, Grau, Read, & Pineau Stam, 2012). Studies illustrate the value of transformational leadership in developing work environments that encourage competent nursing practice and thereby facilitate improved outcomes for patients. Researchers argue that through intellectual stimulation, transformational leaders inspire workers to take part in a decision-making process that promotes strategic thought and the growth of skills and expertise (Walumbwa, Orwa, Wang, & Lawler, 2005; W. Zhu, Avolio, & Walumbwa, 2009).

The earlier studies mainly focused on determining the ways in which the TL affected the quality of healthcare and the patient safety, still there is a need to further investigate the underlying mechanisms between TL style and health care outcomes (Hillen, Pfaff, & Hammer, 2017). This study aims to develop a comprehensive model for how TL affects PS by investigating the underlying role of SC and decision-making capacity (DMC). SC and DCM have been examined in prior researches, but how the relationship between TL with SC and DCM would be effected by the personality characteristics of medical staff/nurses in this sense, have overlooked and what personality of nurses can influence the effectiveness of TL to promote SC and DMC. As different kind of leadership styles can be less or more effective depending on the traits of employees, we focus on locus of control (LC) and examine how the level of internal LC of employees influence the effect of TL on SC and DMC. In addition to the leadership style, the literature on patient safety has shown that the personality characteristics of nurses have a profound impact on PS (Teng, Chang, & Hsu, 2009) and suggested exploring specific attributes influencing PS. (Howell & Shamir, 2005) argued that the characteristics of followers are important determinants of their reactions to leaders. For example, the personality of followers influences their expectations for various types of leaders (Ehrhart & Klein, 2001). Motivation of followers to gain a personal power and control is also likely to influence leadership reactions. This motivation is activated by the locus of control. LC refers to belief about a person's source of control over events (Phares, 1976). Many people believe that they have control over things that happen to them (internal control). Others believe that other outside forces-for example luck, fate, or other powerful people-control what happens to them (external control) (Rotter, 1966). The previous studies indicated that members with internal monitoring locus orientation is more willing to demonstrate transformational leadership behaviors, than leaders who have an external influence orientation locu (Bass, 1985; Howell & Avolio, 1993; Runyon, 1973; Stogdill & Bass, 1981). (Bass, 1985) assumed that high self-confidence, self-determination, and inward direction would be favorably correlated with leaders assessed as transformative by their followers. People high in internal LC believe that they themselves, rather than external factors are in control of their outcomes (T. Chen, Li, & Leung, 2016). (Moreira et al., 2020) argued that the internals have the capability to curb out the negative live events and have better controlling positions. Internally-oriented managers are more able to demonstrate the ability to control the environment, show more personal skills and ready to cope with stressful circumstances (Anderson, 1977; Miller, Kets de Vries, & Toulouse, 1982) (Kipnis, 1976). Internals respond more constructively and with less intervention, such as conflict and self-blame, to anger in experimental tasks than externals (Brisset & Nowicki, 1973); (Butterfield, 1964). This enables them to maintain the safety standards in the hospital.

Characteristics of personality, as well as decision-making, indicate individual variations in human behavior. Any clinical decision-making in nursing is directly affected by cognitive abilities and relies on how nurses perceive the significance of the messages received, their goals and their ability to identify and respond to the often ambiguous clinical and non-clinical situations in the workplace. Human personality-related theories and emotions state that individuals have stable emotional types or personality characteristics, stressing that personality can influence the expression of emotions (Burger, 2008). In their working life, nurses make a variety of choices: moral, medical and practical (Lewenson & Truglio-Londrigan, 2008). Many of the actions taken by a nurse occur in an atmosphere full of interactions and conflicts (Tanner, 2006). Nurse's decisions have a significant effect on the outcome of health care and on the safety of patients (Abdi, Assadi, Mohammadyari, & Miri, 2015; Heyhoe et al., 2016). Blackwell's theory (S. L. Shivers-Blackwell, 2004) describes empirical ideas with consideration to various characteristics of personality that could moderate the connection between organizational context and behavior of the leader, through suggesting that manager's views of the organizational context affect they use of transactional and transformational leadership behaviors. Theory considers that some people perceive organizational role demands and role stresses differently than others, eventually causing them to participate in various leadership behaviors in the same environment (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). This finding also identifies personality as a moderator in the relationship between transformational leadership, safety culture and decision- making capacity. It is suspected that due to variations in personality, some nurses can perceive organizational role demands and role stresses differently than others, potentially causing them to participate in different leadership behavior.

Moreover, based on the above theories we assume that internal LC have a moderating impact. The hospital environment requires more self-motivation and showing up responsibility to handle the emergency situations. As the nurses with high internal LC are more able to control the environment and cope with their emotions, stressful conditions, which ultimately leads to a safe behavior, that eventually stabilizes as a culture of safety, at the same time it leads to be able to take a right decision, as the nurses used to deal with ambulance, risky circumstances, where an urgent response is needed to assess the case sensibly and professionally in order to secure the well-being and safety of the patients. It's an important trait of individuals that has profound effect on their decision-making (Neaves, 1989). There is what respectively suggests, that LC it's a personality characteristic that can influence the effectiveness of TL to promote SC and DMC.

We examine a theory-driven model to study this mechanism. Firstly, it examines an integrated research model that links TL to PS exploring mediating role of SC and decision-making capacity of nurses. Concentrating on SC and the improvement of nurses' DMC illustrates more clearly relationship between TL and PS. Our major contribution lies in internal LC. Drawing on social learning theory we propose that individuals with high internal LC are more affected by TL, generate and can better develop SC and their DMC. It is important to study the moderating role of LC, as this trait of nurses may regulate the effectiveness of TL. Nurses having internal locus of control, have stronger impact of TL and therefore its enable them to make their own decisions and can enhance the efficiency of promoting SC, that can be best fitted for ensuring patient safety. The study will be helpful to the researchers and practitioners in understanding how leadership style and traits of nurses work together to ensure patient safety. This is the first study to examine the moderating role of LC on the relationship of TL with DMC and SC to best of our knowledge. The study provides the evidence from hospitals in Uzbekistan demonstrating how transformational behaviors of hospital executives contribute to safety procedures and what other factors are relevant.

Literature Review

Empirical Studies and Hypotheses Development

Transformational Leadership (TL) and Patient Safety (PS)

The TL is believed to have direct influence on the nurse's quality of work life (Suratno, 2018) that further influences their behaviors towards patients (Sfantou et al.). (Sherman & Pross, 2010) argued that the traditional top-down command and control is becoming obsolete, especially for the organizations where, frequent communication and collaboration comes first (King et al., 2013). Factors undermining SC in the hospitals encompass overemphasis on efficiency and cost controls, organizational and individual inability to acknowledge fallibility, and professional provider norms that promote perfectionism (Nieva & Sorra, 2003). Thus the health care providers must move towards an open, proactive, collaborative approach to report, discuss, and actively learn from errors (Pizzi, Howell, Deshmukh, Cohen, & Nash, 2004). Moreover it is believed that the quality of health services provided by the nurses depend upon improved performance of nurses (Brady & Cummings, 2010) that is likely through having leader's direct influencing them. However majority of the nursing staff has meager control over their workload (Chan & Perry, 2012) for which they can blame the external factors, even their leader. Nurses besides working according to their job descriptions also often have to assume irrelevant administrative responsibilities (Kudo, Yoshimura, Shahzad, Shibuya, & Aizawa, 2012) that may count for their decreased attention towards patient's safety.

Successful nursing leadership is the key to the development of a safe working atmosphere that facilitates positive outcomes for nurses and patients, and few empiric studies have been conducted that explicitly explain and define the direct and indirect processes by which leaders affect change in individuals and patient outcomes. This study draws on theory and research to propose a theoretical model linking transformational leadership to empowerment at the workplace and patient safety. The nurses satisfied with their work and work environment contribute extra ordinary towards patients care (Suratno, 2018). This satisfaction can result from the transformational behaviors of nurses' leader (Boamah, Laschinger, Wong, & Clarke, 2018). Nurses are exposed to varying situations each day and no specific leadership style is in accordance to the continuously varying situations but the transformational leaders are likely to create a positive work environment (Salanova, Lorente, Chambel, & Martínez, 2011). The capabilities of leaders like involving people in their work, enhanced team work, encouraging employees and rewarding good work enable employees to perform even better (Opollo, Gray, & Spies, 2014) and thus increased supporting elements available at the hospital can enhance the likelihood of favorable patient treatments.

The timely support from the transformational leader helps in avoiding errors. The error free working is a key to success for the nurses' profession. The patient related adverse events can be observed in the form of unintended injuries or complications caused by healthcare providers instead of the actual disease (Wong & Cummings, 2007). This is because of the additional responsibilities assigned to the nursing staff in the hospitals. This can be managed well in the presence of the transformational leaders. (Johnson et al., 2012) argued that nurse manager's role is essential in encouraging and adopting new practices for implementing change. They further argued that the TL style structured the nurses' education that is helpful in enhancing patient care. On the contrary (Wong et al., 2013) found inconsistencies in patients' care satisfaction and the leadership practices used.

(Houser, 2003) found that TL practices were positively related to staff expertise and negatively related to staff turnover, both of which contributed to reduced adverse patient outcomes including patient mortality, hospital acquired infections, medication errors and patient falls. (Capuano, Bokovoy, Hitchings, & Houser, 2005) added to these findings by showing that leadership practices were also associated with staff expertise, which in turn decreased the same adverse patient outcomes. In the light of above arguments the following proposed hypothesis can be developed;

Hypothesis 1: *The TL and PS are related positively.*

Safety Culture (SC)

A growing body of studies demonstrates the importance of SC in healthcare organizations but little attention has been paid to examine how it indirectly affects the various relationships like the transformation leadership and PS. (Halligan & Zecevic, 2011) seen SC as "the product of individual and group values, attitudes, competencies and patterns of behavior that determine the commitment to, and

the style and proficiency of, an organization's health and safety programmers". Organizations with a positive SC are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventive measure. The same definition was earlier provided by Health and Safety Commission(Health & Safety, 1993). Moreover it is defined as the collective mental programming towards safety of a group of organization members(Berends & van der, 1996).

The employees working under the transformational leaders see their leaders as caring about them, their health and safety is in safe hands that will allow them to work in a safer and healthier way. This understanding helps them remain satisfied and motivate them to work by choosing the ways they feel more safe and effective (Fulwiler, 2011). The SC protects nurses against any harm in the hospital. The SC once developed by and maintained by the transformational leaders induce the sense of being protected among nurses, makes them satisfied while at the hospital, keep them motivated, and in return they show better performance (Fulwiler & Gerlach), thus ensuring PS. Moreover, transformation leaders actively convey safety goals, which in turn positively affect employees' perceptions of safety priorities, and employees' perceptions of safety environment and employee safety behavior (Clarke, 2013; J. Mullen, Kelloway, & Teed, 2017).

For the nurses, to do good it is necessary to have good first, that is, the safe working environment, also known as SC. SC reflects a proactive stance to improving occupational safety and reflects the ways people think and believe in safety (M. D. Cooper, 2018). (IAEA & Culture, 1991) argued that it encapsulates and explains the organizational safety failings too. The failings can be reduced when the transformational leaders show empowering attitudes to build SC in the hospitals (J. E. Mullen & Kelloway, 2009). Units having stronger SC are likely to have better patient satisfaction than those with a weak SC. The leaders believing in developing a SC in the hospitals have the desire to set up a team to succeed and engage in the discretionary effort to derive the safety value (D. Cooper, 2015). The SC protects nurses against any harm in the hospital. The transformational leaders once developed the SC induce the sense of being protected among nurses, that makes them satisfied with their work and workplaces. This further motivates them and they show better commitment (Fulwiler & Gerlach) and PS is enhanced. The nurses working under the leaders preferring safety at workplace try to take decisions on their own to minimize the possibility of harm(D. Cooper, 2016), thus the empowering SC minimizes the risks of working in hospitals and dealing with patients (Armstrong et al., 2009). Moreover, the SC encourages nurses to adopt proactive behaviors, have more satisfaction and have more control over the work practices(Laschinger, 1996). The above arguments helped in developing the following hypothesis;

Hypothesis 2: The SC mediates the relationship between TL and PS.

Decision Making Capacity (DMC)

A decision-making capacity (DMC) is the ability to comprehend all pertinent information, to appreciate the scenario and its consequences, to weigh treatment options, and to carry out the final decision (Heyland et al., 2003; Mezey, Mitty, & Ramsey, 1997). (Asif, Jameel, Hussain, Hwang, & Sahito, 2019) viewed removal of adverse patient outcomes and enhanced quality of care due to the presence of transformational leaders. This is because the transformational leaders induce factors like boosting job satisfaction and structural empowerment that makes nurses more confident to work and results in PS. When the nurses feel empowered this induces development of self-efficacy among them and they work with more confidence at hospitals that results in achieving PS.

The employee empowerment is the key to effective management(Bose & Emirates, 2018). The empowered employees are likely to remain satisfied, motivated and committed to their organizations(Burke, 1986). The sense of empowerment reduces employee's absenteeism, and turnover(Shields, Brown, Kaine, & North-Samardzic, 2015). This prevents them from adopting work deviant behaviors. The employee empowerment can be used as means to capacity building that in return count towards the organizational progress(Faiza & Nazir, 2015). The capacity building equips employees with required knowledge, skills and added abilities that make people experts in their area of work thus ensuring removal of errors and enhanced PS. The leaders allowing nurses to take their decisions independently boost self-control among them and triggers their engagement (Kenneth & Sky, 2010) thus helping them ensuring PS. Enhancing nurse' dictions making capacity as an empowerment tool has not been much examined earlier, that this study took into consideration. The empowered nurses work on their own and take their independent decisions that add to the strengths of transformational leaders thus ensuring higher safety.

Supervisors have a major influence on employees' mental health. The decision making is made effective through trust in the leader while working in groups such as nurses generally work(Sapp, Torre, Larsen, Holmboe, & Durning, 2019). The timely decisions during patient care likely save lives. The transformational leaders equip followers with knowledge, skills and help them develop confidence (Afsar & Masood, 2018) at the same time the decision making is considered an important clinical skill for nurses (Hagbaghery, Salsali, & Ahmadi, 2004). To support their argument, they have argued that there is a strongly statistically positive link between the overall problem-solving score and the overall decision-making abilities of nurse workers during the program phases. Problem-solving skills should be discussed in the theory and goals of the nursing program and should be incorporated into the application of the nursing method to clinical practice (Ali & Nageeb, 2020). The capacity of making right and timely decisions, by following the guidance of the leader, is seen to have positive repercussions for the safety assurance of patients (Rath & Conchie, 2008). Transformational leaders can help ensure the quality of working life of nurses, which in turn enhances their commitment to work, that is beneficial to both workers and the organization (Gillet, Fouquereau, Bonnaud-Antignac, Mokoukolo, & Colombat, 2013). Teaching early error detection techniques is considered by the transformational leaders to equip followers to protect form error-prone behaviors(Vaismoradi, Griffiths, Turunen, & Jordan, 2016), especially in healthcare. This helps nurses to ensure safety

while dealing with patients. The decision making differs from person to person and may have variant effects on the performance of individuals (Palmer & Harmell, 2016).

Hypothesis 3: *DMC mediates the relationship between TL and PS*

Locus of Control

For nurses, dealing with patients encompasses experiencing stress, anger, pain, depression and so forth (Jennings, 1990; Karimyar Jahromi & Hojat, 2014), the psychological states of the nurses determine their work outcomes. LC is the degree of belief that one has control over the outcome of events - internal locus, as opposed to external forces beyond one's control - external locus (Rotter, 1966). People having strong internal LC believe that events in their life derive primarily from their own actions whereas the strong external LC held the external factors responsible, thus effecting the work environment (Ng, Sorensen, & Eby, 2006).

The external LC is about placing the cause of an outcome upon others and is related to avoidance coping/resignation, greater stress and poor health of employees. The extra administrative duties may call for nurses using external LC and internal LC on the other hand, has been associated with help-seeking and positive thinking, as well as lower levels of work stress in general (Gore, Griffin, & McNierney, 2016), that is generally adopted as a result of leader's transformational leading style.

Rotter agreed that internally controlled people achieve more, are more motivated, and are more resistant to manipulation than externally controlled people. Basically, LC helps empowering nurses that is giving them control, authority and ability to respond as per the situation. Further the empowered nurses are capable of doing what they want to do (Dawson, 1994). The assertiveness in nurses promotes their positive contributions towards the environment that is ensuring the SC and the interdependence among them allows them to take appropriate decision when required. The internally controlled nurses have a role expectation that includes personal responsibility for timings and ensuring other responsibilities. Scholars have long regarded intrinsic motivation as a proximal predictor of creativity and innovative behavior (G. Chen, Farh, Campbell-Bush, Wu, & Wu, 2013).

The health profession is characterized with showing more responsibility for ensuring safety in hospitals and Rotter agreed that internally controlled people achieve more, are more motivated. Internals are likely to generate innovative and nontraditional solutions to problems. People high in internal LC believe that they themselves, rather than external factors such as their supervisors, are in control of their outcomes (T. Chen et al., 2016).

The scale of safety is based on the creation of personality, "locus of control," which represents the degree to which members believe that the effects of their actions and other relationship issues can be regulated by personal effort (Rotter, 1966). Further the internals are found more satisfied from their jobs than externals (Vijayashree & Jagdishchandra, 2011). Similarly the internals are found more action oriented than externals (Gangai, Mahakud, & Sharma, 2016). The above arguments give rise to the following hypotheses;

Hypothesis 4: *The Nurse's LC moderates the relationship between TL and SC*

Hypothesis 5: *The Nurse's LC moderates the relationship between TL and nurse DMC*

Figure 1: Research Framework

Research and Methodology

This study is an effort to determine the impact of transformational leadership on patient safety concerning with role safety culture, decision making capacity and locus of control in the hospitals of Uzbekistan. In the model independent variable is transformational leadership while the dependent variable is patient safety. Moreover, safety culture and decision-making capacity are the mediator variables while the moderating locus of control is the moderating variable in the model.

Sample and Procedure

A cross-sectional data (n = 240 nurses) with a random sampling technique by employing explanatory, and causal design was used to test the developed framework. The survey instruments were distributed by hand among private and public sector male/female nurses (private, n = 120 and public, n = 120). The sample was generated from a list of registered nurses from the administration departments of the hospitals having beds 100 or above. A cover letter explaining the purpose of the study was used with each questionnaire and distributed separately to each nurse to ensure the confidentiality. The hospitals were visited to collect data from the nurses to test the developed framework. Further the Medical superintendent (assuming a role of a leader) was requested to help in collecting responses of nurses in the various departments of the selected hospitals. The English version of the questionnaires were handed over and retrieved back in person from the nurses after ensuring the nurses desirability to participate for healthy response rate. At the same time, it was ensured to keep the confidentiality of the responses received by not asking them their names and identification numbers. Moreover, it was kept in mind that the nurses having less than one year of experience should not be made part of the study because of having less experience to work under a specific supervisor as a leader. The data collection took four months before finalizing the data sheet for analysis. Besides, using PLS-SEM (Joe F. Hair, Ringle, & Sarstedt, 2011) the Harman's one-factor test and the common latent factor (CLF) were used to overcome the possibility of common method bias. The total variance explained by one factor during these tests is 21.55%, which is less than 50% ensuring that the data is unbiased (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Measures

The first section of the questionnaire encompassed the demographic information of the respondents including their age, education, job experience in the same position and the type of hospitals in which they worked (See table 1). The second section encompassed the measures for the constructs that helped in devising the framework. TL was evaluated using the 7 item scale developed by (Carless, Wearing, & Mann, 2000), in which seven questions regrading's, (1) leader communicates the clear and positive vision of the future (2) leader treatment to staff as individuals, supports and encourages their development, (3) leader support which gives encouragement and recognition to staff, (4) leader empowerment and fosters trust, involvement and cooperation among team members, (5) leader innovative and encourages thinking about problems in new ways and questions assumptions, (6) if the leader believes in leading by example and is clear about his values and practices what he preaches (7), leader possess a charismatic personality and instills pride and respect in others and inspires me by being highly competent. The items Cronbach's alpha was 0.93 indicating high alpha coefficient which support and validate the transformational leadership reliable measure. The construct range was 0.76 to 0.88 and mean value is 0.81 while the construct factor loading mean was 0.81, which evidence that TL has strong convergent validity of construct.

The PS was evaluated using the 11 item scale proposed by (Okumura, Ishigaki, Mori, & Fujiwara, 2019), in which include the (1) before a patient enters my department I have prepared the items needed for patient's care, (2) begin patient monitoring within 3 minutes of the patient arriving in the department (3) begin physical examinations within 5 minutes of the patient arriving in the department, (4) execute the doctor's orders on time (within 5 minutes), (5) conduct physical assessments without wasting time. (6) take thoughtful care of patients (e.g., smiling, touching). (7) value what the patient says, (8) actively provide patients with nursing that leads to their recovery, (9) listen attentively to the patient's family's anxiety, (10) provide nursing equally to all patients, and (11) take standard precautions when I touch a patient. The construct ranging from 0.59 to 0.83 and the mean values on the items ranged from 3.52 to 4.52. Their construct Cronbach's alpha coefficients was varied between 0.73 and 0.83. Cronbach's alpha coefficient greater than 0.7 was considered to indicate acceptable reliability and validity of the construct.

Moreover, the internal LC was assessed using the 30 item scale of (Rotter, 1966), which include (1) determine what matters to me in an organization, (2) course of my career depends on me, (3) success or failure depends on the amount of effort I exert, (4), people who are important control matters in this organization, (5) career depends upon my seniors, (6) effectiveness in this organization is determined by senior people, (7) organization a person joins or the job he/she takes is an accidental occurrence, (8) a person's career is a matter of chance, (9) person's success depends upon the breaks or chances he/she receivers and (10) Successful completion of my assignments is due to my detailed planning and hard work, (11) being liked by my seniors or making good impression on them influences promotion decisions, (12) receiving rewards in the organization is a matter of luck, (13) the success of my plans is a matter of luck, (14) receiving a promotion depends upon being in the right place at the right time, (15) preferences of seniors determine who will be rewarded in the organization, (16) success depends on my competence and hard work, (17) much I am liked in an organization depends on my seniors, (18) getting people in an organization to listen to me is a matter of luck, (19) if my seniors do not like me, I will not succeed in this organization, (20) the way I work determines whether or not I receive rewards, and (21) success or failure in an organization is a matter of luck. (22) the success or failure depends on those who work with me, (23) Any promotion I receive will be due to my ability and effort, (24) most things in an organization are beyond the control of the people who work there, (25) most things in an organization are beyond the control of the people who work there, (26) the reason I am acceptable to others in an organization is a matter of luck, (27) determine what happens to me in the organization, (28) the degree to which I am acceptable to others in the organization depends on my behavior with others, (29) ideas are accepted if I make them fit with the desires of my seniors, (30) pressure groups in this organization are more powerful than individual employees are, and they control more things than individuals do. The construct reliability test range .55 to .72 and scale correlate range from — .07 to —.35. SD 3.9 to 4.1. Item analysis and factor analysis showed reasonably high internal consistency for an additive scale. Test-retest reliability was satisfactory, and the scale correlates satisfactorily.

Moreover, a 7 item DMC scale was adopted in this study, that was developed by (Wiens, 1991), in which questions regarding to (1) the clinical supervisor encouraged me to independently arrive at decisions regarding patient care, (2) caring for a patient, I feel I am responsible for making the decisions about their care, (3) necessary skills to make sound decisions about patient care, (4) feel confident about making decisions regarding patient care, and (5) make decisions about patient care that count. (6) Most successful approach to decision making is to carefully examine the data and analyze the options before determining a course of action, and (7) best to solve problems or make decisions by analyzing all the information available to me before forming conclusions. The reliability of the scale (standardized alpha) was .795.

Also, a 7 item scale to measure SC which was proposed by (Li et al., 2017) and questions are regarding (1) to Safety is ensured here while treating patients, (2) medical errors are handled appropriately in this clinical area, (3) know the proper channels to direct questions regarding patient safety in this clinical area, (4) receive appropriate feedback about my performance, (5) clinical area it is not difficult to discuss errors, (6) encouraged by my supervisor and colleagues to report any patient safety concerns I may have, and (7) culture in this clinical area makes it easy to learn from the errors of others. The construct means for the 7 items ranged from 3.02 to 4.27, with standard deviation (SD) between 0.75 and 1.17. The construct the item factor loadings were between 0.09 and 0.91. Cronbach's α was 0.91 and ranged between 0.66 and 0.91 which indicate the construct good of fit in consistency and validity.

All the statements written in the questionnaire were rated using disagreement to agreement (Strongly Disagree to Strongly Agree) at 5- points Likert scale.

Demographics

The complete sample demographic information of full-time nurses working in the hospitals are presented in Table 1.

Table 1: Demographic Information of Participants

Variable	Category	Frequency	Percentage (Overall)	Frequency (Public)	Percentage (Public)	Frequency (Private)	Percentage (Private)
Age (years)	26-35	37	15.4	17	12.1	20	14.3
	36-45	132	55	62	44.3	70	50.0
	46-55	71	29.6	41	29.3	30	21.4
Experience (years)	1—5	97	40.4	41	29.3	56	40.0
	6—10	137	57.1	75	53.6	62	44.3
	>11	6	2.5	4	2.9	2	1.4
Gender	Male	116	49.3	61	43.6	55	39.3
	Female	124	51.7	59	42.1	65	46.4
Education	Bachelors	158	65.8	72	51.4	86	61.4
	Masters	44	18.3	25	17.9	19	13.6
	MS	38	15.8	23	16.4	15	10.7

The Table 1 shows that most of the nurses were having age limit between 36 to 45 years ($n = 132, 55.0\%$). Also, most of were having experience between 6-10 years in the same hospitals showing 57.1% which indicate that that they have an adequate experience and time to deal with the patients and to work in the same environment. The sample survey considered appropriate for generating responses about the constructs being studied. The statistics show that among the nurses, who responded to the questionnaire survey 51.7 % were female and 49.3% were male nurses. Therefore, sample response rate is balanced. The nurses having at-least Bachelor degree which the basic qualification to work in the hospital are the most along with having Masters and MS degrees.

Empirical Results and Discussion

Measurement model

The measurement model comprises of three bits of information including the outer loadings, the reliability of the measurements and the Average Variance Extracted, to show the convergent validity. The convergent validity concerns with sowing the degree to which multiple items to measure the same concept are in agreement (Joseph F. Hair, Anderson, Babin, & Black, 2010). The Table 2 below shows the detailed information.

Table 2: Evaluation of outer model

Construct	Items	Loading	Alpha	C. R.	AVE
Transformational leadership (TL)	TL1	0.91	0.968	0.97	0.823
	TL2	0.927			
	TL3	0.89			
	TL4	0.857			
	TL5	0.92			
	TL6	0.913			
	TL7	0.933			
Patient safety (PS)	PS1	0.899	0.953	0.954	0.776
	PS2	0.921			
	PS3	0.921			
	PS4	0.923			
	PS8	0.865			
	PS9	0.743			
Safety culture (SC)	SC1	0.93	0.973	0.975	0.848
	SC2	0.909			
	SC3	0.914			
	SC4	0.926			
	SC5	0.939			
	SC6	0.907			
	SC7	0.92			
Nurse Decision Making (DMC)	DMC1	0.918	0.959	0.96	0.775
	DMC2	0.922			
	DMC3	0.848			
	DMC4	0.894			
	DMC5	0.789			
	DMC6	0.847			
	DMC7	0.933			
Locus of Control (LC)	LC1	0.918	0.966	0.966	0.803
	LC2	0.894			
	LC6	0.777			
	LC7	0.924			
	LC10	0.906			
	LC11	0.915			
	LC12	0.929			

All loadings are significant at $p < 0.01$

The measurement model allowed to further test the structural adequacy by having the loadings and composite reliability equal to or more than 0.7 and Average Variance Extracted fulfilling the required criteria i.e., more than 0.5. All values of Cronbach's alpha are more than the minimum threshold of 0.7.

Table 3 presents the discriminant validity, examined to show that each construct must share more variance with its measures than with the other constructs in the same model, was assessed using square root of the Average Variance Extracted (AVE) and the correlation coefficients of the measures of the construct. Items should load more strongly on their own constructs in the model, and the average variance shared between each construct its measures should be greater than the variance shared between the constructs.

Table 3. Discriminant Validity

Constructs	1	2	3	4	5
TL	0.907				
PS	0.631	0.881			
SC	0.538	0.744	0.921		
DMC	0.761	0.623	0.752	0.882	
LC	0.549	0.735	0.659	0.741	0.896

All correlations are significant at $p < 0.01$

Structural model

The model fitness was examined using fitness indices like SRMR = 0.038, chi-Square = 793.767, and NFI = 0.914, showing the adequate model fitness. Further, (Hair Jr, Sarstedt, Ringle, & Gudergan, 2017) suggested considering the beta and the corresponding t-values via bootstrapping procedure with a sub-samples of 5,000.

The coefficients show that the TL has a positive and significant relationship with patient's safety ($\beta = 0.244$, $t > 1.96$, $p = 0.002$) providing the evidence for acceptance of H1. All relations in the structural model were found to be significant as shown in table 4. For mediation analysis we run the model without including any mediating variable and found that TL has high direct impact on PS ($\beta = 0.682$, $p < 0.01$). When SC was introduced as mediator, the direct effect of TL on PS decreased to $\beta = 0.462$ and it was still significant at $p < 0.01$.

Table 4: Analysis of structural model

Relationships	Coefficient (β)	t-Statistic	p-value
TL--->PS	0.244	3.093	0.002
TL--->SC	0.279	3.223	0.001
SC--->PS	0.51	7.047	0.000
TL--->DMC	0.387	5.269	0.000
DMC--->PS	0.307	3.581	0.000

Then we added DMC also as the mediator and found that the direct effect of TL on PS further reduced to $\beta = 0.244$ but it still remained significant at $p < 0.0$, demonstrating that SC and DMC partially mediate the relationship between TL and PS. Mediation analysis provides evidence for acceptance of H2 and H3.

Table 5 further shows that indirect effect of TL on PS through SC is significant ($\beta = 0.142$, $p < 0.01$). Similarly effect of TL on PS through DMC is also significant ($\beta = 0.089$, $p < 0.05$).

Table 5: Indirect and moderation effects.

Relationships	Coefficient	t-Statistic	p-value
TL--->SC--->PS	0.142	3.887	0.000
TL--->DMC--->PS	0.089	2.235	0.026
Moderating effect1--->SC	0.164	2.278	0.023
Moderating effect2--->DMC	0.218	4.106	0.000

Figure 2: Moderating effect of LC between TL and SC.

Figure 3: Moderating effect of LC between TL and DMC.

It was found that LC strengthens the relationship between TL and SC and this moderation relationship is significant ($\beta=0.164$, $p<0.01$), so H4 is accepted. Figure 2 shows that when LC is high then effect of TL on SC is also high represented by the upper line. Lower line accounts for the relationship in case of low LC. Similarly Figure 3 shows the relationship of TL and DMC becomes stronger when internal LC is high and vice versa for the lower internal LC. Thus, moderation effect of internal LC is significant ($\beta=0.218$, $p<0.01$) and supports the approval of H5.

Discussion

Positive patient outcomes have noteworthy importance for the health care organizations across the world but the healthcare schemes have been observed faulty due to organizational and individual factors involved that result in producing adverse patient outcomes. The current study is an effort to identify the person related factors effecting PS. The current study addresses the PS thought examining the interaction of personal factors such as LC, DMC and one organizational factor that is SC. Nurses contact and provide service to patients directly, (Greenslade & Jimmieson, 2011) they are main players in the health care organizations (J. Zhu, Rodgers, & Melia, 2014) since their behavior is constantly affected by their leaders and they further effect the PS. When the leaders listen the problems of the nurses they try to address those problems leading to enhanced self-confidence among them. Earlier studies have shown a horrible rate of patient accidents due to nurse's attitudes and behaviors towards patients (Asif et al., 2019) due to lack of confidence to deal patients.

As a whole the transformational leaders have significant contribution in ensuring PS. Studies demonstrate the importance of transformational leadership in the creation of work environments that promote professional nursing practice and thereby foster better outcomes for patients. Individuals with a high sense of TL attitudes have an important and beneficial influence on healthy workplace cultures (Weng et al., 2015) and promote a successful SC. The results are consistent with earlier findings by showing that the TL is considered an effective way of ensuring patient care and safety (Boamah et al., 2018). Under the supervision of the transformational leaders the nurses generally learn and adopt. The role of transformational leaders cannot be ignored for their continuous guidance,

better communication and willingness to collaborate with nurses. (Houser, 2003) and (Capuano et al., 2005) found leadership as a key aspect affecting patient outcomes. The leaders with relational skills are more effective than leaders with traditional managerial skills. It is also noted that strong leaders recruited and kept good nurses. The nurses having better expertise tend to produce better patient outcomes (providing better care). They found that in the presence of leader the team work and staff expertise (as parts of SC) having negative relationship with adverse patient outcomes. In the presence of transformational leaders the nurses can perform well by having readily available guidance from leaders and can mitigate the risks of diminished PS. Transformational leaders without nurses and nurses without the transformational leaders cannot ensure positive patient outcomes because the leaders are the ones to develop the SC and the nurses are the ones to maintain it. The developed SC make environment conducive for better patient outcomes. In addition through intellectual stimulation transformative leaders encourage staff to take part in a decision-making process that encourages strategic thinking and the advancement of skills and knowledge (Walumbwa et al., 2005; W. Zhu et al., 2009). As the nurses become more competent by having support from their leaders for taking their own decisions, this results in declined adverse events. The DMC of nurses help them to take timely decisions and to handle multiple number of patients simultaneously and the nurses have to treat them with caution so in the presence of transformational leaders the DMC of the nurses enhances by being empowered that play an integral role in managing the patients care (Armstrong et al., 2009). The transformational leaders help shaping a SC and they can engage their employees to bring in the required improvements that make their nursing units outstanding, with an improved degree of quality in patient care (Murray, Sundin, & Cope, 2018). Basically it is due to the engagement of each nurse that improves safety outcomes. The transformational leaders, besides molding human behaviors, focus on developing and improving organizational systems that last long even in the absence of leaders. The nurses are able to use their working autonomy upon being empowered by their leaders to take decisions independently to handle any uncertain situation.

Previous studies have focused on identifying the ways in which TL influences the quality of health care and the protection of patients, but there is still a need to further examine the fundamental mechanisms between TL style and health care outcomes. Theoretically, safety culture and decision-making capacity are critical aspects of nurses at the health care organizations that have a direct effect on patient safety through which TL can build nurses' work environments that promote professional nursing practice and thus foster better outcomes for patients. Based on theories, we examined the mediation functions of SC and DMC between TL and PS, which was found to be significant. Although in our key investigation, we would like to discover how the relationship between TL, SC and DMC will be influenced by the personality characteristics of the nurses, what the personality of the nurses might have a significant influence on TL.

Further by considering testing model proposed by (S. L. Shivers-Blackwell, 2004) method that offers empirical recommendations for the various personality characteristics that may moderate the relationship between the organizational background and the actions of the leader. The analysis also recognizes personality as a moderator variable in the relationship between TL, SC and DMC. It is known that due to variations in personality, some nurses will experience organizational skills role expectations and role pressures are different from others which inevitably lead to different leadership behaviors. For such situations the nurses try to control the environment through having internal or external locus. Internal locus people take the responsibility of the occurring taking place at the workplace and the externals blame the factors around them. Dealing with patients requires high level of attention and responsibility to deal with each patient having different treatment. Individuals with high internal LC are more inclined towards creative self-efficacy (Malik, Butt, & Choi, 2015) than those with the low internal LC. Nurses are in direct contact with patients and a minor negligence can count a lot. It becomes necessary to examine the leader's role in patient's safety and whether internal locus plays significantly, to cope with stressors, like working with patients.

Our main contribution lies in personal characteristics internal LC. Earlier studies have found members with internal monitoring locus orientation are more likely to display transformational leadership behaviors; (Howell & Avolio, 1993) (Bass, 1985; Runyon, 1973; Stogdill & Bass, 1981). (Bass, 1985), high self-confidence, self-determination and inward direction will be favorably associated with leaders assessed to be transformative by their followers and have the capacity to curb unpleasant live events (Moreira et al., 2020), to monitor the environment, display personal skills and be prepared to cope with stressful circumstances (Miller et al., 1982) (Anderson, 1977) (Kipnis, 1976). Internals are able to respond constructively with less interference, such as tension to frustration in experimental tasks than externals (Brisset & Nowicki, 1973; Butterfield, 1964). This facilitates them to uphold the safety standards of the hospital.

Every patient care in nursing is directly affected by cognitive processes and relies on how nurses estimate the significance of the requests made, their goals and their ability to identify and react to uncertain clinical and non-clinical situations at work to environmental influences which have been confirmed effect on nurse's decision-making (Kennedy, Curtis, & Waters, 2014; Madjaroski, 2018; Ntantana et al., 2017) Personal characteristics are assumed to affect physiological and behavioral issues associated in decision-making (Suratno, 2018). Nurses with a high internal LC receiving the correct involvement decisions, explore possible approaches, evaluate patient details, determine the effects of such procedures and mainly explore further knowledge. Besides this, decision-making process in nursing, it's a critical importance to the effect of patient outcomes and safety. In this study, nurses established internal locus of control, indicating that they have been likely to act and more frequently felt that they were concerned for whatever is happening to them. This states that nurses are worried about the potential positive and negative outcomes of the procedure. They note that they are deciding in terms of the evidence presented and that they are mindful of potential errors and obligations for the statements made. It appears that the nurse's personality trait of LC provides a useful theoretical perspective to

enhance nurse' workplace attitudes and behaviors ensuring PS. We believe that internal LC is a personality trait that can affect the efficacy of TL in promoting SC and DMC.

Drawing on learning theory, we indicate that individuals with a high internal LC are more influenced by TL, generate and better grow SC and their DMC. It is necessary to research the moderating function of LC, as this characteristic of nurses can regulate the effectiveness of TL. Nurses with high internal locus of control have a greater effect on TL and thereby empower them to make their own decisions and can increase the quality of SC promotion that can best be implemented to ensure patient safety. The purpose of this research was to incorporate internal LC as a moderator in the relationship between TL, SC and DMC, to explore what personality of nurses are more effected by TL, the study demonstrates that nurses act differently, especially, in nursing with high internal LC. Therefore it was suggested that the utilization of transformational behaviors goes beyond the objective sense of the organizations (S. Shivers-Blackwell, 2006) and personality plays an important role. We conclude that personality trait internal LC has an important role to play in the organizational effectiveness, in stability and security of culture that can establish a higher transformational impact within the organization. To the best of our knowledge, this is the first research to investigate, the moderating role of internal LC in the relationship between TL and DMC and SC.

Conclusions

The variety of strategies can be suggested on the basis of the findings of the study. The transformational leaders are appropriately contributing towards PS and the nurses need time to time guidance from their leaders to perform well for providing better health care. For boosting PS and care empowering nurses to take decision on their own can benefit not only the transformational leaders in terms of saving time and focusing their concentration on sensitive cases but also give the opportunity to the nurses to develop themselves for dealing with crisis situations. Therefore, healthcare management authorities should focus on transformational leadership in the hospital industry and train their employees on soft-skills (emotional-intelligence, empathetic behavior) which are necessary to deal with patients suffering from stress. Further, Leaders are advised to improve the quality of work for nurses, such that they do not face emotional laboring while taking care of patients. Besides, hospital industry can introduce counseling department for staff to manage their mental well-being.

We examined a theoretical-driven model to research this mechanism. First it discusses an applied research model linking TL to PS, which explored the mediating role of SC and the decision-making ability of nurses. Theoretically, safety culture and decision-making capacity are vital aspects of nurses in health care organizations that have a direct impact on patient safety where the TL can create nurses' work environments that encourage skilled nursing practice and thus promote safer outcomes for patients. The findings of the present study demonstrated the significant role of transformational leadership played in order to improve working conditions and the environment, which helps nurses to create good conditions, relationship with patients and increase patient safety. Focusing on SC and developing nurses' DMC reveals more clearly the relationship between TL and PS. Since different types of leadership can be less or more successful depending on the characteristics of employees, we concentrate on the locus of control (LC) and analyze how the degree of internal LC of employees affects the impact of TL on SC and DMC. Our results make an empirical contribution to the current literature by developing a locus of control as a moderator between TL, SC and DMC. Drawing on social learning theory, we propose that individuals with a high internal LC are more influenced by TL, generate and better grow SC and their DMC. Nurses having internal locus of control, have stronger impact of TL and therefore its enable them to make their own decisions and can enhance the efficiency of promoting SC, that can be best fitted for ensuring patient safety. The study will be helpful to the researchers and practitioners in understanding how leadership style and traits of nurses work together to ensure patient safety. This is the first study to examine the moderating role of LC on the relationship of TL with DMC and SC to best of our knowledge. The study provides the evidence, demonstrating how transformational behaviors of hospital executives contribute to safety procedures and what other factors are relevant.

Limitations and Future directions

The study remained sector specific and the collection of data through questionnaire may result in self – reported bias and to avoid these bias researchers may use multiple sources of data gathering tools including interviews in combination to questionnaire to cross-check the truth of the responses gathered. PS was considered the only construct of interest for the examination; other hospital related constructs may add to the base of literature upon empirical examination. Future research efforts may also be directed towards examining the gender and sectorial differences by considering the same set of factors for in-depth insights. It is necessary to research the moderating function of LC, as this characteristic of nurses can regulate the effectiveness of TL. Nurses with internal locus of control have a greater effect on TL and thus allow them to make their own decisions and can increase the quality of SC promotion that can best be modified to ensuring patient safety.

Conflicts of Interest

The authors declare no conflict of interest.

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