Effects of Professional Autonomy and Leadership Style on the Team-Based Practice of Acute Care Nurse Practitioners in Taiwan

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ABSTRACT

Background: Little is known regarding the factors that affect the team-based practice of nurse practitioners (NPs). Examining the relationships between these factors and team-based practice may provide important insights into the strength of the NP practice.

Purpose: This study was designed to examine the effects of practice autonomy and leadership style on the team-based practice of acute care NPs working in hospitals.

Methods: A cross-sectional, national survey design was conducted to examine the autonomy, leadership, and team-based practice of NPs. One thousand three hundred ninety-one NPs completed the questionnaire, which included demographic and practice variables, the Dempster Practice Behavior Scale, the Multifactor Leadership Questionnaire, and the NP–physician relations subscale of the Nurse Practitioner Primary Care Organizational Climate Questionnaire. The hierarchical linear model was used to differentiate between the NP-level and organization-level effects on team-based practice. Multiple regression was applied to explore the factors associated with team-based practice.

Results: The hierarchical linear model results identified no organization-level effect on team-based practice. Moreover, the results of the regression model found that NPs with greater autonomy in actualization, empowerment, and readiness, and idealized influence leadership style enhanced the performance of the doctor of medicine–NP team-based practice. The final model explained 39% of the variance in doctor of medicine–NP team-based practice. Autonomy in actualization and empowerment were identified as the two most important predictors.

Conclusions/Implications for Practice: The practice autonomy and leadership style of NPs influence the efficiency of team-based practice in Taiwan. To improve the team-based practice of NPs, healthcare administrators must support the practice autonomy of NPs.

KEY WORDS: autonomy, leadership, team-based practice, acute care nurse practitioners, national survey.

Introduction

Most people in Taiwan (99.93%) are enrolled in the National Health Insurance single-payer system (National Health Insurance Administration, Ministry of Health and Welfare, Taiwan, ROC, 2020), which is designed to make access to healthcare easy and inexpensive for the population. In addition, Taiwan is facing a rapidly growing aging population (20% of the population in 2026 is expected to be over 65 years old), increased acuity in hospitalized patients, working hour restrictions for residents and physicians, and consumer demand for care that meets minimum quality and safety standards, all of which have led to increasing demand for healthcare services. Addressing the growing healthcare strains, the Taiwan Government has authorized formal nurse practitioner (NP) regulations and programs. NPs have provided healthcare to inpatients via doctor of medicine–NP (MD-NP) team-based practice since 2006 (Chiu et al., 2016; Tsay et al., 2019). NPs provide nursing and medical care to meet the complex needs of patients and their families using a holistic, health-centered approach. NPs represent an important part of the workforce and work with physicians to deliver team-based care. They contribute to meeting the growing demand for healthcare in acute care practices. However, there is controversy over the expanding role of NPs in acute care, as this trend may challenge the current teamwork relationship between NPs and physicians. To date, little evidence is available regarding the best way to facilitate teamwork between NPs and physicians in acute care hospital settings.

The team-based care or practice model was implemented in response to changes in the healthcare system, including an increasing number of older patients with chronic diseases and the multidecade rise in medical costs per patient (Mitchell et al., 2012). However, team-based care, multidisciplinary care, collaborative care, and multispecialty care have often been used interchangeably in the literature (van der Marck & Bloem,
The Institute of Medicine defined team-based care as “the provision of health services to individuals, families, and/or communities by at least two healthcare providers who work collaboratively with patients and their caregivers to accomplish shared goals within and across settings to achieve coordinated high-quality care” (as cited in Mitchell et al., 2012, p. 5). Baik (2017), utilizing a concept analysis framework, revealed that team-based care embraces interprofessional collaboration, a patient-centered approach, and integrated care processes. This is accomplished by understanding the roles and responsibilities of other team members, mutual respect, and organizational support. Team-based practice is vital to providing patient-centered care and to promoting care quality, safety, and improved patient experiences (Mitchell et al., 2012). In addition, a growing body of research indicates that team-based practice is associated with improved patient outcomes such as decreased hospital readmission rates for high-risk patients and reduced length of hospital stays (Brandt et al., 2014; Mitchell et al., 2012).

NPs frequently work with physicians in team-based practices in hospitals (Cowan et al., 2006). However, NP practice autonomy is often misinterpreted and is a source of confusion that impedes professional development (American Association of Nurse Practitioners, 2018). Recently, Peacock and Hernandez (2020) conducted a concept analysis that redefined practice autonomy as NPs’ use of their experience, clinical judgment, and responsibility to practice without restriction in professional collaboration with other healthcare professionals. Autonomy allows NPs to practice to the maximum extent of their advanced education and to continue to influence healthcare outcomes. The American Association of Nurse Practitioners categorized NP practice into full practice, reduced practice, and restricted practice (American Association of Nurse Practitioners, 2018). Full practice allows NPs to evaluate patients; to diagnose, order, and interpret diagnostic tests; and to prescribe medications. Reduced practice requires a regulated, collaborative agreement to provide patient care. Restricted practice requires supervision, delegation, or team management to provide patient care. Although NPs have the potential to fill the gap in care in Taiwan, their practice autonomy continues to be threatened in large part by the Physician Practice Act, which restricts nonphysicians from providing medical care to patients. In other words, the practice of NPs in Taiwan continues to fall into the “restricted practice” category based on its team-based care requirements.

The effect of NP autonomy may be positive or negative. The potential, positive effects include eliminating patient barriers, improved cost-effectiveness of care, increased NP job satisfaction, increased quality of patient care, and improved efficiency of MD-NP team-based practice. The potential, negative effects include decreased NP job satisfaction, lower empathy, and professional burnout (Peacock & Hernandez, 2020; Poghosyan et al., 2014). The autonomy level of NPs differs between primary care and acute care settings. A national survey of NP autonomy \(N = 8,311\) found that NPs working in primary care reported the highest levels of autonomy, whereas those working in hospital settings reported the lowest levels (Athey et al., 2016). In contrast, a small study of acute care NPs \(n = 54\) in different specialty areas in a large metropolitan hospital reported that NPs have high, overall levels of autonomy (Cajulis & Fitzpatrick, 2007). Nonetheless, the level of autonomy of NPs in acute care settings in Taiwan is an issue that has not yet been explored in the literature. In addition, autonomy specifically feeling that one’s NP skills are fully utilized, was found to be an important predictor of efficacy in team-based practice (Athey et al., 2016). Little is known about the factors affecting the team-based practice of NPs. Examining these relationships is expected to provide insights into the strength of NP practice.

Leadership has a potentially vital role to play in promoting team-based practice by engaging members in collaborative efforts to better meet patient needs. One of the best known forms of leadership, transformational leadership, has been shown to be effective in maximizing the performance and outcomes of individuals and team-based practice (Fischer, 2016). NPs achieve leadership by empowering others and highlighting the importance of interpersonal relationships within the care team. In practice, leadership approaches often involve setting a vision and motivating people to achieve common goals and focus on working collaboratively. NPs see themselves as group members rather than exerting hierarchical power over others in practice. Poghosyan and Bernhardt (2018) investigated transformational leadership in 278 primary care NPs, finding that nearly 50% reported that leaders did not share information equally between NPs and physicians. They also found that 46% reported that NPs were not represented on important organizational committees. Perceptions of team-based practice and leadership are mutually related and may impact the ability of clinicians to provide patient care safely (Manser, 2009). Researchers have recommended that leaders in primary care practices consider applying transformational leadership principles to promote NP practice. Van Kraaij et al. (2020) explored the perceptions of the leadership roles of NPs in Dutch hospital care, finding that NP leadership mainly related to direct clinical patient care and that leadership at the professional and organizational levels appeared to be underutilized. However, the leadership of NPs needs further exploration in Taiwan.

The relationships among the autonomy, leadership, and team-based practice of NPs have been infrequently studied, particularly in acute care settings. In one recent study, 163 primary care practices in Massachusetts were surveyed to investigate whether the autonomy of NPs and their relationships with leadership affect the relationship between NPs and physicians within team-based practice settings (Poghosyan & Liu, 2016). They found that autonomy and leadership significantly predicted teamwork between NPs and physicians, explaining 41% of the variance in team-based care. Nonetheless, they collected data in one state only, which limits the generalizability of their results to NPs in other primary care settings. On the basis of the above, a gap exists in the research with regard to the actual level of NP involvement in team-based
practice. Researchers need to address that gap by exploring the complex factors that influence team-based practice. This study was designed to examine factors that predict the efficacy of NP team-based practice in acute care settings using a large, national sample of NPs. Specifically, we were interested in examining the extent to which autonomy and leadership relate to team-based practice. Elucidating the relationships among professional autonomy, leadership style, and team-based practice is important to better supporting clinical practice, as NPs continue to struggle to engage in the full scope of practice in Taiwan.

Methods

Study Design, Setting, and Participants
This study used a cross-sectional design and a national survey to investigate and explore the relationships among autonomy, leadership style, and team-based practice in acute care NPs in Taiwan. Data were collected using an anonymous structured questionnaire provided as an online survey from April 1 to May 30, 2020.

The participants were drawn from the nationwide database of the Taiwan Association of Nurse Practitioners (TANP), which includes approximately 95% of NPs in Taiwan. Eligibility criteria for participants were as follows: (a) active member of TANP, (b) national NP certified, and (c) working in clinical practice for at least 1 year as an NP in an acute care setting. The 6,000 eligible, active members of TANP all received invitations to participate via email. NPs who agreed to participate in this study signed an informed consent form before taking the online survey. They completed the questionnaires on the online survey platform SurveyCake (25sprout, Taipei City, Taiwan). The questionnaires included demographic and practice characteristics, the Dempster Practice Behavior Scale (DPBS), the Multifactor Leadership Questionnaire (MLQ-6S), and the NP–physician relations (NP-PR) subscale of the Nurse Practitioner Primary Care Organizational Climate Questionnaire (NP-PCOCQ). One thousand four hundred forty-two NPs working at 181 hospitals completed the survey (response rate: 24.03%). The 1,391 participants who completed the survey without missing data were included in the analysis.

Considering the statistical power, the minimal sample size estimated using G*Power 3.1 under the setting (power = .90, α = .05, effect size $f^2 = .10$, 10 predictors) for multiple regression analysis was 215. We estimated about a 20% no-response rate. Therefore, at least 258 participants were necessary, and the sample size acquired ($n = 1,391$) greatly exceeded this number. The institutional review board of the hospital approved this study (approval number: 2020012).

Measures

Demographic characteristics
Demographic data collected included age, years of experience, annual salary (New Taiwan dollar [NTD]), patient load (per day), overtime hours, number of NPs in hospital, gender, education, marital status, care model, shift work status, intention to leave in the coming 1-year period, background of practice managers, hospital level, and work region. For the hierarchical linear model (HLM) analysis, the organization-level and individual-level effects on team-based practice were investigated.

Autonomy
The DPBS, which was designed to measure the extent to which autonomous behaviors occur in practice, was used to measure autonomy in the NPs (Dempster, 1990). This scale comprises 30 items rated on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale comprises the four subscales of readiness, empowerment, actualization, and valuation. Readiness measures competence, skill, and mastery; empowerment measures rights and privileges; actualization measures decision making, accepting responsibility, and accountability for actions; and valuation measures self-respect, value, worth, achievement, and satisfaction. The DPBS total possible score ranges from 30 to 150, with higher scores corresponding with higher levels of autonomy. The DPBS has shown adequate reliability and validity in previous research (Dempster, 1990, 1994; Goolsby et al., 2020). The Cronbach’s α was .93 for the DPBS in this study.

Leadership
The MLQ-6S is widely used to measure leadership style in clinical practice (Bass & Avolio, 1992, 2004). This questionnaire comprises 21 items rated on a 5-point Likert-type scale ranging from 1 (not at all) to 5 (frequently if not always). MLQ-6S has seven subscales that measure three different leadership styles. The transformational leadership scale comprises the factors of idealized influence, individualized consideration, intellectual stimulation, and inspirational motivation, whereas the transactional leadership scale consists of contingent reward and management by exception. A further scale deals with laissez-faire leadership as passive/avoidant leadership.

The score of each subscale (three items) may be categorized as high (12–15), moderate (8–11), or low (1–7), with higher scores corresponding to higher levels of leadership style, as perceived by NPs in practice. Satisfactory reliability and validity have been reported for the MLQ-6S in previous studies (Bass & Avolio, 2004; Moon et al., 2019; Tejeda et al., 2001). The Cronbach’s α was .91 for this questionnaire in this study.

Team-based practice
Team-based practice was evaluated in this study using the NP-PR subscale of the NP-PCOCQ. The NP-PCOCQ was developed based on evidence-based practice and interviews with NPs (Poghosyan et al., 2013). The relationship between NPs and physicians is critical in care settings because of the close collaboration required among these healthcare providers (Poghosyan et al., 2013). NP-PR is able to access information on the relationship, communication, and teamwork between
NPs and physicians, which may act as team-based practice in the work setting. The NP-PR subscale consists of seven items rated on a 4-point Likert-type scale from 1 (strongly disagree) to 4 (strongly agree), with higher scores indicating higher levels of team-based practice. This subscale has been shown to provide satisfactory reliability (Cronbach's α: .87-.95) and validity (Poghosyan et al., 2013, 2017). The Cronbach's α of the NP-PR was .91 in this study.

Data Analysis
The descriptive statistics in this study were expressed in terms of percentage, mean, and standard deviation (SD), and Pearson product-moment correlations were performed among the continuous variables. An independent-samples test was computed to examine the differences in continuous variables between the two groups.

To control for the potential influence of individual acute-care hospital settings on team-based practice (i.e., the organizational effect), the HLM was used to separately assess the organizational and individual (NP) effects on team-based practice. The 1,391 NP participants (Level 1) were nested within the 181 acute care hospitals (Level 2) in line with the recommendations of Hox (1998). First, the null model was generated to detect the presence of an organizational effect on the practice level of team-based practice. Next, a chi-square test was applied on the Level 2 residual variance and the intraclass correlation coefficient (ICC) indexes, including ICC(1) and ICC(2), to examine the rationale of the HLM analysis. ICC(1) and ICC(2) values of > .059 and > .6, respectively, are required to conduct HLM analysis (Glick, 1985; Hofmann, 1997). If the ICC indexes of the null model met the criteria, the HLM analysis was performed. If the organization level was shown to not significantly affect teamwork, multiple regression analysis was deemed appropriate for examining the association between the individual characteristics of NPs and team-based practice.

All of the variables found to be significantly associated with team-based practice were included in the stepwise multiple regression analysis. The statistics of the regression analysis, including regression coefficients (β), standard error (SE), ΔR², and R², were estimated. The p values Values (two-sided tests) less than .05 were statistically significant. Statistical analyses were performed using IBM SPSS Statistics Version 22.0 (IBM Inc., Armonk, NY, USA) and HLM Version 7 (Scientific Software International, Skokie, IL, USA).

Results
The characteristics of the participants and the associations between these characteristics and team-based practice are presented in Table 1. The mean age of the participants was 41.72 years (SD = 5.37; range: 26–58 years), mean NP experience was 7.58 years (SD = 4.41; range: 1–15 years), mean annual salary was 798,000 NTD (SD = 15.55; range: 42–150 NTD), and mean day-shift patient load (number per day) was 12.71 (SD = 9.11; range: 1–51). The hospitals covered in this study employed an average of 81.04 NPs (SD = 59.75; range: 1–350), most of whom were female (95.8%), married (66.1%), and involved in MD and NP team-based practice. Significantly over one in 10 participants (15.6%) indicated that they intended to leave the nursing profession within 1 year. Many of the participants (67.5%) directly reported to managers with no NP background, and many practiced outside the medical center (62.3%) and northern Taiwan (57.3%).

Participant age (t = −0.10, p < .01), years of NP experience (r = .14, p < .01), annual salary (r = .13, p < .01), number of NP employees working at the hospital (r = .08, p = .02), educational level (t = 4.22, p < .001), care model used (t = −2.45, p = .01), intention to leave within 1 year (t = −5.89, p < .001), and hospital level (t = 2.83, p = .01) were all significantly associated with team-based practice.

Descriptive statistics for all of the scales are shown in Table 2. The means of the autonomy dimensions indicate that the level of autonomy among the participants was lowest in empowerment (item mean = 2.45, SD = 0.49), indicating that they perceived low levels of empowerment in practice. The item mean scores on the leadership subscales were highest for idealized motivation (item mean = 3.91, SD = 0.53), followed by laissez-faire leadership (item mean = 3.32, SD = 0.58). The item mean score for team-based practice was 3.15 (SD = 0.45), indicating a moderately high level of team-based practice. All of the subscales for autonomy (ranging from .39 to .61, p < .001) and leadership (ranging from .09 to .41, p < .001) showed significantly positive correlations with team-based practice.

The results of the HLM analysis are shown in Table 3. The random effect (τ00) reached significance (χ² = 258.31, p < .001). However, the ICC(1) showed a low correlation among the different organizations (ICC(1) = .06), and the ICC(2) was also far less than .6 (ICC(2) = .26), which does not support the use of multilevel modeling. Therefore, organization-level effects may have a minimal impact on the team-based practice of NPs. Multiple regression analysis was thus more appropriate for examining the association between NP characteristics and team-based practice (Table 3).

The results of the stepwise multiple linear regression indicated that the participants with greater autonomy in actualization (β = .26, p < .001), empowerment (β = .20, p < .001), and readiness (β = .20, p < .001) had better team-based practice. In addition, the idealized influence leadership style (β = .13, p < .001) and hospital level (β = .06, p < .001) were shown to improve team-based practice performance. The final model explained 39% of the variance in team-based practice (F = 8.93, p < .001, R² = .39), whereas autonomy in actualization and empowerment were the two most important predictors of team-based practice, explaining about 35% of the variance (Table 4).

Discussion
A national survey was employed in this study to explore the factors that predict the efficacy of the team-based practice of
NPs in acute care settings. The important predictors of team-based practice were identified as autonomy in actualization, empowerment, readiness, and idealized influence leadership style. Autonomy in actualization and empowerment were, respectively, the strongest and second-strongest predictor of team-based practice. In other words, NPs with higher autonomy enhance the efficacy of team-based practice. In particular, NPs who make decisions on patient care, take responsibility and accountability for their actions, and have practice rights and privileges have obtained the competence, skills, and mastery necessary for patient care. All are essential to team-based practice. NPs who use the idealized influence leadership style have the potential to act as strong role models for professional teams who work together in team-based practice (Poghosyan & Bernhardt, 2018). Furthermore, the data indicate that medical centers have more efficient team-based practice than either regional or community hospitals.

The results for NP autonomy found moderate levels of readiness, actualization, and valuation. The empowerment dimension of autonomy was found to be at a moderately low level, which indicates that the participants lacked confidence in their current practice rights and privileges. The findings further support the positive effect of autonomy on team-based practice, especially actualization. These results are consistent

| Variable                              | n     | %     | Team-Based Practice | p       |
|---------------------------------------|-------|-------|---------------------|---------|
|                                       | Mean  | SD    | t/r                 | <.05    |
| Age (year)                            | 41.72 | 5.73  | .10                 | <.01**  |
| Years as NP                           | 7.85  | 4.41  | .14                 | <.01**  |
| Annual salary (10,000 NTD)            | 79.80 | 15.55 | .13                 | <.01**  |
| Patient load (per day shift)          | 12.71 | 9.11  | −.05                | .07     |
| Overtime hours                        | 0.96  | 0.69  | .02                 | .55     |
| Number of NPs in hospital             | 81.04 | 59.75 | .08                 | .02*    |
| Gender                                |       |       |                     |         |
| Female                                | 1,333 | 95.8  | 22.04               | 2.99    | −1.22  | .23    |
| Male                                  | 58    | 4.2   | 21.57               | 2.89    |        |        |
| Graduate degree                       |       |       |                     |         |
| Yes                                   | 262   | 18.8  | 22.75               | 3.19    | 4.22   | <.001***|
| No                                    | 1,129 | 81.2  | 21.85               | 2.79    |        |        |
| Marital status                        |       |       |                     |         |
| Married                               | 919   | 66.1  | 22.05               | 2.81    | 0.48   | .63    |
| Unmarried                             | 472   | 33.9  | 21.97               | 3.03    |        |        |
| Care model                            |       |       |                     |         |
| VS + R + NP                           | 467   | 33.6  | 22.29               | 2.90    | −2.45  | .01*   |
| VS + NP                              | 924   | 66.4  | 21.89               | 2.88    |        |        |
| Shift work                            |       |       |                     |         |
| Yes                                   | 611   | 43.9  | 22.03               | 2.89    | 0.16   | .87    |
| No                                    | 780   | 56.1  | 22.01               | 2.89    |        |        |
| Intention to leave within 1 year      |       |       |                     |         |
| Yes                                   | 217   | 15.6  | 20.91               | 3.05    | −5.89  | <.001***|
| No                                    | 1,174 | 84.4  | 22.22               | 2.81    |        |        |
| Managers                              |       |       |                     |         |
| With NP background                    | 452   | 32.5  | 22.13               | 2.86    | 0.97   | .33    |
| Without NP background                 | 939   | 67.5  | 21.97               | 2.90    |        |        |
| Hospital level                        |       |       |                     |         |
| Medical center                       | 525   | 37.7  | 22.30               | 2.88    | 2.83   | .01*   |
| Nonmedical center                     | 866   | 62.3  | 21.85               | 2.88    |        |        |
| Geographic region                     |       |       |                     |         |
| Northern                              | 594   | 42.7  | 22.01               | 2.86    | −1.12  | .91    |
| Other                                 | 797   | 57.3  | 22.03               | 2.92    |        |        |

Note. NTD = New Taiwan dollar; VS = visiting staff; R = resident; NP = nurse practitioner.

*p < .05. **p < .01. ***p < .001.
with previous studies (Fletcher et al., 2007; Poghosyan & Liu, 2016). There are many explanations for the low empowerment autonomy of NPs in Taiwan. First, NPs practice in a restricted practice category that requires physician supervision. Although NPs make complicated medical decisions on healthcare, they also collaborate closely with physicians, which may limit their autonomy (Lee, 2020). Second, hospitals have implemented task-shifting reforms that transfer part of the duty for patient care from physicians to NPs to meet patients’ medical care demands (Maier & Aiken, 2016). Third, NPs who perform a combination of nursing care and medical care may encounter difficulties in creating autonomous practice (Weiland, 2015). Last, hospital care remains hierarchical in nature, with physicians holding the leading position in team-based care, which may limit the autonomy of NPs. Without sufficient practice autonomy, the role of NPs is unlikely to be maximized in the healthcare system (Dempster, 1994).

NPs are frequently required to make timely medical decisions. Thus, autonomy is critical to providing effective and efficient care (Mick & Ackerman, 2000). Hospital administrators need to provide practice support and allow NPs their rightful place to practice to effectively reduce the loading of healthcare demands and expand the capacity of the medical care workforce. With higher practice autonomy, NPs are more likely to engage in teamwork, which was revealed in this study in the higher reported efficiency of team-based practice.
in participants with higher levels of practice autonomy (Poghosyan & Liu, 2016). Furthermore, medical science is advancing constantly. Acute care NPs must demonstrate their competencies and quality of patient care through advanced educational programs or continued learning to enhance their professional capabilities. Importantly, nursing leaders must continue bargaining with lawmakers and policymakers to upgrade the NP practice from a restricted-practice category to a reduced- or full-practice category so that NPs may use their experience, clinical judgment, and responsibility to practice with fewer restrictions in team-based care.

The participants in this study perceived their leadership as moderate, particularly in the areas of idealized influence and inspirational motivation. This result is consistent with other studies that reported NPs as mainly occupied with clinical care and caseload responsibilities and noted that leadership in other areas such as professional or organization involvement appeared underutilized (Elliott et al., 2016; van Kraaij et al., 2020). In this study, a positive association was found between leadership style and team-based practice, which is in agreement with previous studies (Manser, 2009; Poghosyan & Liu, 2016). Leadership may reflect and benefit the autonomy of NPs within their organizations and thereby improve teamwork (Poghosyan & Liu, 2016). The data in this study further indicate that idealized influence affects team-based practice positively. The idealized influence style indicates that NPs obtain colleagues’ trust and respect, which allows their acting as role models in practice (Bass & Avolio, 2004; Dempster, 1990). The participants also stated that clinical leadership is achieved by empowering others, with an emphasis on interpersonal relationships within the team, which can influence the ability of NPs to ensure effective teamwork (van Kraaij et al., 2020). NPs’ adequate use of leadership is crucial to developing the role and position of NPs in Taiwan. Furthermore, utilizing leadership to develop the NP profession may help better support the scope of practice of NPs. On the basis of the results of this research, hospital administrators should develop leadership training programs that are specific to the NP practice and improve interprofessional teamwork care. Future research should explore how the idealized influence leadership style affects NP care and outcomes.

The findings of this study add to the evidence regarding the important, positive relationships among autonomy, leadership, and team-based practice and are consistent with the study of primary care NPs by Poghosyan and Liu (2016). For instance, favorable autonomy and leadership may enhance teamwork in both primary care and acute care settings. The additional effects of distinct autonomy, including actualization, empowerment, readiness, and idealized influence leadership type, were found in this study on team-based practice in the acute care setting. Compared with primary care, patients in acute care require sufficient autonomy to achieve efficient care and beneficial outcomes. Moreover, NPs with idealized influence leadership styles are better able to earn the trust and respect of subordinates and act as their role models, especially in team-based practice settings (Bass & Avolio, 2004). Generally, leadership is a component of the NP role, and NPs should have a significant impact on the development of practice, professionalization of their team-based practice, and providing of quality and safe healthcare services in acute care practices (Elliott et al., 2016). The long-term sustainability of NPs’ clinical practice depends on their ability to perform and develop the leadership component of their role. Therefore, NPs must enhance their leadership competency through continuing education.

A significant organizational effect on team-based practice was not found in this study, which differed from Poghosyan and Liu (2016). This may indicate that the organizational effect is not the main factor affecting team-based practice in acute care settings in Taiwan. In addition, the results of this study confirmed a low correlation among different organizations (ICC[1] = .06, ICC[2] = .26), supporting that the influence of the personal level may be greater than the organizational effect. The ICC indexes, especially ICC(2), may have been affected by the small sample size. Future studies with a small sample size should take both ICC(1) and ICC(2) for the rationality of conducting HLM analysis instead of considering only one index. In addition, further studies are needed to investigate organizational effects before conducting regression.

### Table 4

| Step | B     | SE  | $R^2$ | $\Delta R^2$ | $F$   | $\beta$ | t    |
|------|-------|-----|-------|--------------|-------|---------|------|
| Intercept | 5.11  | .59 |       |              |       | .00     | 8.60*** |
| Autonomy |       |     |       |              |       |         |      |
| Actualization | .20   | .03 | .30   | .30          | 605.45*** | .26 | 7.10*** |
| Empowerment | .17   | .02 | .35   | .05          | 99.53*** | .20 | 8.79*** |
| Readiness | .11   | .02 | .37   | .02          | 41.87*** | .20 | 5.24*** |
| Leadership |       |     |       |              |       |         |      |
| Idealized influence | .23   | .05 | .38   | .01          | 26.36*** | .13 | 5.13*** |
| Hospital level (ref: nonmedical center) | .38   | .13 | .39   | .004        | 8.93*** | .06 | 2.99*** |

Note. NP = nurse practitioner; ref = reference.
***p < .001.
analyses on this issue. Every acute care hospital in Taiwan follows a similar NP-MD team-based practice model, and the roles and responsibilities of NPs and physicians are well defined under national regulations. Nevertheless, the proportion of variance for team-based practice was found to be quite low (0.4%). As mentioned above, level of autonomy was shown to be key to team-based practice. Administrators in hospitals may need to develop organizational policies to enhance the autonomy of NPs, so the relationship between NPs and physicians in team-based practice will improve.

Limitations
One limitation of this study was the response bias that always accompanies self-reported questionnaires. However, our data were obtained via an anonymous online survey, which may have reduced the negative effects of response bias. Next, this study used a cross-sectional design, and the results cannot imply causal inferences. Longitudinal study designs will be necessary to explore the causal factors of team-based practice and to extend these findings in future research. In addition, physicians did not participate in the study survey, so team-based practice from their perspective, which may differ from that of NPs, was not explored. Further research may include physicians when exploring team care in NP practice. Finally, response rate was a potentially confounding issue, although the rate in this study was comparable with that achieved in other NP surveys. Low response rate is a common issue in mailed or online surveys. The response rate of 24.03% in this study is considered acceptable (mean = 35.7%, SD = 18.8) based on Baruch and Holtom (2008). In addition, the lack of a significant difference in age between our data and national data based on the TANP database (t = 0.82, p = .41) further supports the representativeness of the sample used.

Conclusions
The findings of this study add to the evidence on the relationships among practice autonomy, leadership, and team-based practice in NPs. NPs with greater autonomy in actualization, empowerment, and readiness, and those who employed the idealized influence style of leadership, were found to have higher team-based practice efficiency. This study identified increasing the autonomy of NPs in clinical practice as a novel strategy to significantly enhance the effectiveness of team-based practice. Healthcare administrators must improve autonomy in NPs by supporting actualization, empowerment, and readiness in acute care practices. Moreover, we found that NPs who more frequently used the idealized influence leadership style were more efficient in team-based practice. Acute care organizations may develop advanced educational programs or leadership training for NPs to enhance their ability and competencies in practice, leading to enhanced team proficiency in team-based practice.

Implications for Nursing Management
The findings of this study suggest that improving the professional autonomy of NPs is essential to enhancing the MD-NP team-based model of practice. NPs frequently make patient care decisions, so professional autonomy is critical to improving quality of care. Hospital administrators must establish an efficient NP practice support model and allow NPs to practice within the scope of this model. With higher practice autonomy, NPs will be better able to engage in teamwork, leading to higher team-based practice efficiency (Poghosyan & Liu, 2016). Moreover, acute care NPs must promote their competencies through regular participation in continuing education to document their care outcomes in practice. Critically, nursing leaders must continue negotiating with lawmakers and policymakers to formulate the regulations and scope-of-practice guidelines necessary to upgrade NPs from the restricted-practice to the full-practice category to give NPs a defined role with responsibility and accountability in MD-NP team-based care. Finally, the findings of this study revealed that NPs who employed the idealized influence leadership style improved the performance of team-based practice and that NPs’ adequate use of leadership is essential for role development and for the NP profession as a whole. On the basis of these results, hospital administrators are encouraged to develop leadership training programs that are specific to NPs’ practice and improve interprofessional teamwork care.

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