



Physician-nurse collaboration in the relationship between professional autonomy and practice behaviors

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Arzu Bulut 

Bandirma Onyedi Eylul University

Halil Sengül, Çeçenya İrem Mumcu and Berkan Mumcu

Sabahattin Zaim University

Abstract

Background: Nurses and physicians are key members of healthcare teams. While physicians are responsible for the diagnosis and treatment of patients, nurses are part of the treatment and the primary practitioners of patient care. Nurses' professional autonomy, collaboration with physicians, and practice behaviors in treatment and patient care practices are interrelated.

Objectives: In the present study, we examined the mediating effect of physician–nurse collaboration on the relationship between nurses' practice behaviors and their professional autonomy.

Design: The present study utilized a cross-sectional survey design following quantitative methods.

Methods: This study was conducted in the Istanbul Province of Türkiye from September to October 2022. The sampling method used was a convenience sampling strategy to provide easier access to participants when selecting nurses from different health institutions. The mean age of the 295 nurses was 31.23 years, with ages ranging from 21 to 59 years. The data analysis was conducted using IBM's SPSS 24.0 software package and the Process Macro 4.0 plug-in.

Ethical consideration: Research ethics approval was obtained from the researcher's university.

Results: Physician–nurse collaboration is positively associated with practice behaviors and professional autonomy. Nurses' professional autonomy in practice behaviors through physician–nurse collaboration is significant (95% CI [0.043, 0.135]).

Discussion: Our results revealed the relationships among physician–nurse collaboration, professional autonomy, and practice behaviors among nurses.

Conclusion: Our results provide evidence on the underlying factors of nurses' practice behaviors in patient care and guide the development of an intervention program to enhance this collaboration. Hospital managers can contribute to a collaborative physician–nurse working environment.

Corresponding author:

Arzu Bulut, Bandirma Onyedi Eylul University, Faculty of Health Sciences, Department of Health Management, Sehit Asubstay Mustafa Soner Varlık Street, No:77 Bandirma/Balikesir, Türkiye 10200.

Email: abulut@bandirma.edu.tr

Keywords

Autonomy, nursing, physician–nurse collaboration, practice behaviors, professional autonomy

Introduction

The health workforce consists of people who aim to engage in health-promoting activities. The health workforce includes personnel who provide direct services to patients, such as nurses, physicians, dentists, pharmacists, and a wide range of personnel, from managers to support staff who do not have direct patient contact during health services.¹ However, nurses and physicians are critical members of healthcare teams and play an essential role in patient care and outcomes. While physicians are responsible for diagnosing and treating patients, nurses are part of the treatment and the primary practitioners of patient care. Although nurses are said to be part of treatment and primary practitioners of patient care, globally, the roles of nurses have been addressed in different ways. The most widely accepted distinction is the classification of Nurse Practitioner, Advanced Practice Nurse, Advanced Nurse Practitioner, and Clinical Nurse Specialist in the “Guide to Advanced Practice Nursing” published by the International Council of Nurses.²

These levels of specialization in nursing also reveal nurses’ professional autonomy. Nurses’ professional autonomy, collaboration with physicians, and practice behaviors in treatment and patient care practices are interrelated concepts that affect each other. In health systems, nurses need autonomy for patient care activities. Nurse autonomy is the ability to carry out nursing practice without permission from anyone.³

Teamwork is essential for providing quality and safe patient care. Collaboration has become essential because critically ill patients require a complex care process.⁴ Physician–nurse collaboration is much more than just working together in a shared working environment; professional collaboration between physicians and nurses is essential for patient treatment and care. Establishing this collaboration and ensuring nurse autonomy will also affect the practice behaviors of nurses while practicing their profession. Nursing encompasses the autonomous and collaborative care of individuals, families, groups, and communities of all ages, both sick and healthy.⁵

Nurses working in the nursing profession at Türkiye have graduated from three basic levels of education: high school, associate degree, and undergraduate degree. The proportion of nurses with postgraduate education has also increased in recent years. The fact that nurses with different levels of education work in Türkiye is an obstacle to professional autonomy and causes problems such as the authority of doctors over nurses to remain unresolved.

Although significant advances have been made in advanced nursing practice, considerable challenges remain. This complexity can be described as the inability of many nurses to explain precisely what they do. All nurses know how to nurse, and there is a relationship between nursing knowledge and practice, but what they know, how they know it, and how they reflect it in their approaches may be different due to the unique experiences of each nurse. Their ability and desire to reflect on these experiences also differ.

The main goal of health care is to improve the outcomes of the treatment and care provided to patients, and the practice behaviors of nurses significantly affect patient outcomes.⁶ This study aimed to examine the mediating role of physician–nurse collaboration in the relationship between practice behaviors and professional autonomy of nurses with different levels of education in Türkiye.

Conceptual framework

The theoretical foundation for this study is discussed in this section. First, both the conceptual and operationalized meanings of the variables included in this study are discussed, which helps rationalize the

measurement in this study. The second section focuses on the associations between the nurses' practice behaviors and professional autonomy, along with the mediating functions of physician–nurse collaboration.

Nurse autonomy

The concept of autonomy has carried over many themes from ancient Greece to the present day, including wide variations such as ability, self-management, competence, freedom, critical thinking, and self-regulation.⁷ When we look at the literature to define autonomy in the workplace, we see that many similar terms are used. The most commonly used terms are job autonomy, work autonomy, operational autonomy, and practical autonomy. In the literature, professional autonomy is defined as the ability to think and act for oneself, based on specific rules determined by internal and external factors or influences, in tasks that need to be decided.^{8,9}

Many concepts have been used for autonomy in the nursing literature. The most commonly used concepts are professional autonomy, job autonomy, clinical autonomy, control over work, nursing activities, individual autonomy, and organizational autonomy, all of which are used interchangeably.⁸ Professional autonomy in nurses is defined as the ability not to depend on others, knowledge, competence, self-management, decision-making, freedom, support and friendly relationship with patients, judgment, self-control and responsiveness, and the ability to apply professional knowledge to patient care and clinical decision-making.¹⁰ According to Kramer et al. (2006), professional autonomy consists of three dimensions. The first dimension is decisions made for the primary and immediate benefit of the patient. This dimension is the clinical or practice autonomy dimension, which includes the decisions nurses make in an independent, interrelated, and accountable manner. The second dimension is control over autonomy or organizational autonomy in nursing practices. This dimension is related to nurses' development and regulation of nursing policies. The third dimension is work autonomy. Nurses can organize work during working hours and determine the priorities among these tasks.¹¹ It is possible to consider nurses' autonomy in different categories. Of these categories, clinical and professional autonomy are the two most widely accepted. Oshodi et al. (2019) defined clinical autonomy as nurses' ability to act beyond standard practices and make decisions about individual patient care.¹²

On the other hand, professional autonomy can be defined as the ability to make independent decisions and make use of one's competence. Independence in decision-making is critical to professional autonomy, as it allows nurses to draw fully on their knowledge and skills. Clinical independence means the freedom to make decisions regarding patient care and working independently.¹³ The ability to use competence, a key element of independence in the workplace, includes making independent decisions in the best interests of patients.^{14–16} The ability to use competence also includes organizing the functioning of the work unit, solving problems without taking orders, and performing nursing activities independently.^{14,15,17} The ability to use competence is a concept that includes taking responsibility for one's own decisions and being accountable for the results.^{14,18} Another important aspect of using one's competence is having control over nursing activities, such as organizing one's work schedule, determining which activities to prioritize during shifts, and coordinating patient care.^{13,15} Although professional autonomy is expressed in many ways, we see that the concept of autonomy includes the same essential components. These components are ability, independence, control, responsibility, accountability, authority, and self-implementation.¹⁹

A nurse's role in patient care delivery is critical as a healthcare team member. This role is crucial in medical sciences, where professionalism and professional behavior are at the forefront.^{20,21} In addition, professionalism and professional conduct are important in health services, which are the main subjects of medical science.²¹ For this reason, nurses and the nursing discipline must constantly update themselves and adapt to these changes. A nurse is not just someone who takes orders. Nurses are expected to be the people who think, decide, and take responsibility for their decisions while performing nursing activities or providing healthcare

services. It is one of the most basic requirements for nurses to have individual and professional autonomy to fulfill these expectations.^{22,23} Autonomy is the main element of professional practice in nursing.^{23–25}

Nurse autonomy is the professional capacity to make decisions within the full scope of professional nursing practice based on knowledge and clinical judgment. Nurse autonomy is manifested in preexisting accountability systems that include patient care, the expectations of health professionals about each other, and workplace-specific policies and procedures. These systems' interactions produce situations requiring nurse autonomy in decision-making to ensure that patients' needs are safely met.²⁶

The specialized duties of physicians and nurses, the two main actors of health services, require autonomy.²⁷ Because autonomy is the cornerstone of any profession, nurses seek to strengthen the nursing profession by promoting clinical autonomy.²⁸ Nurses who successfully integrate behaviors associated with professional nurse autonomy into their belief systems perceive that they control their work environment and profession.¹²

Defining professional nurses' autonomy helps to increase our understanding of nurses' personal and professional experiences as healthcare providers. At the individual level, autonomy allows nurses to practice their advanced education, participate in productive and voluntary collaboration, and reduce healthcare inconsistencies. Autonomy should be a clear expectation and goal for the nursing role.²⁹

Professional autonomy and interprofessional collaboration are interrelated concepts affecting the quality of care, cost of care, patient outcome, and labor turnover. They also influence the physical and mental health of nurses.³⁰ While physician treatments have been considered the most important in healthcare for many years, the superiority of nursing care is now recognized. One of the most important goals of modern health systems is to move from treatment superiority to care superiority.²⁷ We see that the quality of patient care is directly linked to nurse staffing, the nurse skill mix, and the level of autonomy and decision-making of nurses.³¹

One of the essential elements of providing high-quality care is effective collaboration between physicians and nurses, which enables the exchange of information and thus strengthens treatment.³² If the professional autonomy of nurses is ensured, the care needs of patients are carefully determined by nurses, and necessary nursing measures are taken.⁵

Physician–nurse collaboration

Changes in customer needs and the increasing complexity of these needs are forcing multiple healthcare professionals to work together within health systems to achieve better patient outcomes. However, we must also recognize that individuals from different health disciplines bring their unique perspectives to teamwork. While this can lead to some conflicts, it demonstrates the importance of interprofessional collaboration.³³

Interprofessional collaboration involves developing and maintaining effective interprofessional working relationships with practitioners, patients, and the community to ensure the best health outcomes. Elements of cooperation include respect, trust, shared decision-making, and partnerships. For interprofessional teams of students and practitioners to work collaboratively, their roles need to be clarified. Additionally, in team functioning, collaborative leadership, patient, client, family, and community-centered care, and the integration of service focus are all supported through interprofessional communication. Effective interprofessional communication depends on the ability of teams to address conflicting perspectives and reach reasonable compromises.²⁸

Interprofessional collaboration has been defined by the World Health Organization as a fundamental policy approach to addressing the problems of health professionals and transforming the health system.³⁴ In many healthcare organizations, optimizing patient care quality and health outcomes has been recognized as an essential component of interprofessional collaboration.³⁵ Europe and the United States have long affirmed the importance of interdisciplinary collaboration between medical specialists and healthcare professionals,

evaluated the impact of interdisciplinary collaboration on the quality of care, and made great efforts to strengthen collaboration.³⁶

Physicians and nurses are the two most critical healthcare professionals in the healthcare system. Although they assume separate and different roles in the provision of health services, they must collaborate effectively to provide quality service to patients. If we look at the physician–nurse relationship as a more specific area than the World Health Organization’s definition of interprofessional collaboration in health systems, we will be able to see many different definitions.³⁴ For example, Elsous et al. (2017) defined collaboration between nurses and physicians as “nurses and physicians working together, sharing responsibilities for addressing challenges and making decisions to frame and implement patient care plans”.³⁵ According to Petri (2010), physician–nurse collaboration is an interpersonal process in which physicians and nurses emerge with common goals. Both parties should have equal decision-making capacity, responsibility, and power in managing patient care. Mutual trust, respect, and open and effective communication are essential in this relationship. Each profession should acknowledge and accept the other’s roles, skills, and responsibilities.³²

In the past, nurse–physician interaction has been characterized by physician dominance, nurse subordination and physician superiority. Physicians assume a paternalistic and directive role, while nurses assume this role.³⁷ Such relationships make physicians strictly responsible and superior to nurses. Nurses were then expected to follow orders and avoid open communication with doctors as much as possible. Many nurses described such practices as a stifling experience that diminished the professional value of nurses and increased their job dissatisfaction.³⁸ This situation has led to the emergence of some gaps in physician–nurse collaboration. A lack of collaboration between nurses and physicians can have negative consequences for patient recovery, such as reducing the quality of nursing, job dissatisfaction, and overall lack of autonomy for nurses. All these factors further increase the financial burden on hospitals.^{32,38} A lack of effective nurse–physician collaboration has been shown to be the main reason for more than 70% of major medical errors.³⁹ It also costs the Centers for Medicare and Medicaid Services more than \$4 billion annually.⁴⁰

While JCI’s 2022 report analyzes the root cause of sentinel events, events such as communication breakdowns (e.g., failure to establish a common understanding or mental model among care team members or lack of or inadequate communication of critical information between staff) continue to be the primary factor contributing to sentinel events. Factors contributing to layoffs include policies not followed, lack of shared understanding or mental model, and inadequate team communication before, during, or after a shared team task.⁴¹

The Interprofessional Health Collaboration Framework in Canada has been developed to facilitate interprofessional collaboration due to gaps in collaboration between nurses and doctors in the delivery of healthcare services. Unlike focusing on exhibited behaviors to determine competence, the Canadian Interprofessional Health Collaboration Framework integrates knowledge, skills, attitudes, and values when making judgments. This competency framework is integrated into education and practice in a way that builds upon practitioners’ current knowledge, values, skills, attitudes, and assessments.

The Canadian Interprofessional Competency Framework identifies six competency domains essential for interprofessional collaborative practice: (a) interprofessional communication; (b) patient, family, and community-centered care; (c) role clarification; (d) team functioning; (e) collaborative leadership; and (f) interprofessional conflict resolution. These six competency domains highlight the knowledge, skills, attitudes, and values that shape judgments necessary for interprofessional collaborative practice.²⁸

Nurses and physicians should be able to make independent decisions and have the power to implement them within interprofessional collaboration.¹⁴ For good physician–nurse collaboration, the professional boundaries of physicians and nurses should also be defined. Physicians and nurses should be involved in the decision-making process based on their professional expertise to achieve the best results in the care provided to patients.⁴² Physician–nurse collaboration is a working relationship in the form of making joint decisions for patient care and sharing the responsibility and power of managing patient care.³² In addition to the positive

outcomes of physician–nurse collaboration, problems and conflicts may arise in implementing effective collaboration.⁴³ In the delivery of healthcare services, disagreements often arise due to differing role expectations between physicians and nurses, leading to potential conflicts. Physicians tend to see themselves as the dominant authority in patient care and view nurses as professionals who should follow physician orders. However, nurses prioritize teamwork and effective collaboration, seeking respect and appreciation from physicians.^{31,44–46} As a result of these differences in perspectives, negative behaviors emerge between physicians and nurses, and sometimes physicians display rude and frightening behaviors. These situations can cause nurses to experience stress and low self-esteem.⁴⁴ This is partly due to the dominant demographics within healthcare, the power imbalance between the sexes, the autocratic management styles of physicians, and the historical dependence of the nursing profession on medical physicians.⁴⁷ Many factors, such as the power of authority, social status, and gender, can influence physician–nurse collaboration. A good relationship can help effective interdisciplinary communication and collaboration. Improving patient safety requires addressing the existing hierarchical professional relationship inherent in healthcare delivery.⁴⁸ For this reason, each country must determine the preferred type of physician–nurse relationship according to its sociological characteristics because this relationship's direction impacts nurses' autonomy and practice behaviors.

Practice behaviors

Autonomy is a fundamental characteristic of nursing, as in all professions, and the basis for advanced nursing practice. Practice behaviors refer to varying amounts of independence about the realization and evaluation of a practice. Nurses' professional autonomy in practice behaviors is reflected in four themes: shared leadership, professional skills, interprofessional collaboration, and providing a healthy working environment. Shared leadership is the most important of these four themes. Shared leadership is critical in professional autonomy, as it gives nurses more influence than traditional hierarchical leadership in providing patient care and having a say in practice.⁴⁹

The knowledge factor in practice behaviors is significant, as it reflects nurses' clinical skills and defines their ability to both make decisions and take action.^{16,49} The definitions offered for interprofessional collaboration and professional autonomy suggest that they require the power to make decisions, the ability to implement them, and the willingness to take responsibility for them. Therefore, interprofessional collaboration and professional autonomy seem interrelated; they affect the quality of care, patient outcome, care costs, turnover rate, and both the physical and mental health of nurses.⁵

In this study, we examined the influences of physician–nurse collaboration and nurses' professional autonomy on practice behaviors. To our knowledge, whether physician–nurse collaboration mediates the relationship between nurses' professional autonomy and practice behaviors has not been examined. Collaboration between nurses and physicians is a well-studied topic.^{49–55} Previous studies have started to examine the relationships between nurses' professional autonomy and physician–nurse collaboration and job stress,⁵⁶ personal characteristics and organizational influences,⁵⁷ patient safety⁵⁸ organizational commitment and turnover intention,⁵⁹ role conflict, and job embeddedness.⁶⁰

To date, studies have shown the relationship between physician–nurse collaboration and nurses' professional autonomy. Therefore, there is a need for studies on how physician–nurse collaboration and nurses' professional autonomy affect practice behaviors. To date, the hypothesis that physician–nurse collaboration mediates the relationship between nurses' professional autonomy and practice behaviors has not been tested. This is the first study to test the mediating effect of physician–nurse collaboration on the relationship between nurses' professional autonomy and practice behaviors. This reveals the importance of our research. The hypothesis model is shown in [Figure 1](#). We hypothesized the following:

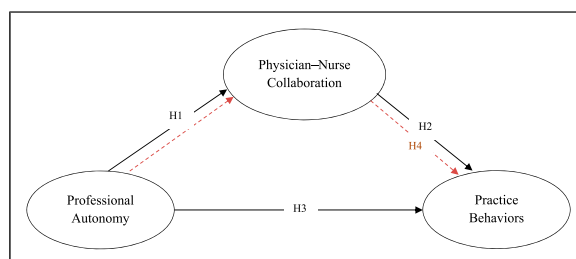


Figure 1. Hypothesis model.

Hypotheses of the study

H1. Nurses' professional autonomy positively and significantly affects physician–nurse collaboration.

H2. Physician–nurse collaboration positively and significantly affects nurses' practice behaviors.

H3. Nurses' professional autonomy positively and significantly affects their practice behaviors.

H4. Nurses' professional autonomy positively and significantly affects their practice behaviors through physician–nurse collaboration.

Methods

Study design

The present study utilized a cross-sectional survey design following quantitative methods. Cross-sectional surveys gather data at a single point to make inferences about a population of interest.⁶¹

Study sample and procedure

This study was conducted at 15 health institutions in the Istanbul province of Türkiye. A total of 321 nurses working in Family Medicine, Public Training and Research Hospitals, Public Service Hospitals, University Hospitals, and Private Hospitals participated in the research from September to October 2022. We followed a two-step procedure to select our research participants. First, we used a convenience sampling strategy to provide easier access to participants when selecting nurses from different health institutions. Second, we contacted nurse managers and nurses recognized by the researchers through WhatsApp, phone, and email. We prepared online questionnaire forms using Google Forms and distributed them to nurse managers and nurses through WhatsApp and email to avoid missing data. On the first page of the online survey, nurses were informed about the research, given contact information for the research team, and were presented with an informed consent form. All the participants were guaranteed the confidentiality of their private information and their right to withdraw from the study at any time. In total, 510 surveys were sent through WhatsApp and email. Five of those e-mails were undeliverable, which left us with 505 usable e-mails, from which we received 321 completed online surveys through Google Forms. This yielded a net response rate of 63.6%.

The sample size of 321 participants was considered adequate based on the standards of power analysis.^{62,63} According to the power analysis conducted using the G*Power (3.1.9.7) program,⁶⁴ the minimum sample size required in the present study was 77 ($\alpha = 0.05$, effect size (f^2) = 0.15, power ($1 - \beta$) = 0.80, predictable variables = 3). Although the minimum sample size required was 77, we collected data from 321 participants based on the expectation of missing data or erroneous responses. Each participant took approximately 10 min

to complete the data collection form, and 321 nurses completed the online survey. Because nurses' professional work experience can strongly impact their recognition of professional autonomy and autonomy behaviors in nursing practice, novice nurses with less than 1 year of professional experience were excluded from the present study. For this reason, 16 questionnaire forms were excluded from the study. In addition, participants who were outside the range of standard Z scores for each variable were considered outliers, and 10 participants were excluded from the data set. These analyses were conducted with a total of 295 nurses.

The mean age of the participants was 31.23 years ($SD = 7.70$), with ages ranging from 21 to 59 years. Of the 295 participants, 43 (14.6%) were males, and 252 (85.4%) were females. The characteristics of the nurses are shown in [Table 1](#).

Table 1. The characteristics of the nurses.

	Mean	SD
Age	31.23	7.70
Professional working years	8.97	8.07
Institution working years	4.74	5.02
	N	%
Gender		
Female	252	85.4
Male	43	14.6
Professional working years		
≤ 5 years	150	50.8
> 5 years	145	49.2
Marital status		
Married	145	49.2
Single	150	50.8
Graduation degree		
High school	14	4.5
Pre-bachelor's	21	6.8
Bachelor's	219	70.4
Master's	57	18.3
Institution type		
Family medicine	20	6.8
Public education and research hospital	88	29.8
Public service hospital	147	49.8
Private hospital	18	6.1
University hospital	22	7.5
Managerial position		
Yes	69	23.4
No	226	76.6

SD: Standard deviation.

Measurements

The data collection form used in this study consisted of four parts. The first part, the “Personal Information Form,” collected descriptive information from the participants. The second part, “The Jefferson Attitudes Toward Physician–Nurse Collaboration Scale (JSAPNC),” developed by Hojat and Herman (1985) and adapted into Turkish by Yıldırım et al. (2006), measured participants’ attitudes toward physician–nurse collaboration according to four subdimensions. The third part, the “Nurses’ Attitude Toward Professional Autonomy Scale (NPAAS),” developed by Leary and Kowalski (1993) and adapted into Turkish by Coskun (2009), measured participants’ cognitive aspects of professional autonomy and tendency to behave autonomously according to three subdimensions. The fourth part, the Dempster Practice Behaviors Scale (DPBS), developed by Judith Dempster (1990) and adapted into Turkish by Sonmez et al. (2016), measured participants’ autonomy behaviors in practice according to four subdimensions.

Personal information form. This form collected information on participants’ age, gender, professional working years, marital status, graduation degree, institution working and managerial position.

The Jefferson attitudes toward physician–nurse collaboration. The Jefferson Attitudes Toward Physician–Nurse Collaboration Scale, developed by Hojat and Herman (1985),⁶⁵ was adapted into Turkish by Yıldırım et al. (2006).⁶⁶ The scale assesses physicians’ and nurses’ attitudes toward sharing responsibilities, collaborative decision-making, role expectations, authority, autonomy, and education in the care and treatment of patients.⁶⁶ The scale consists of 15 items answered on a 4-point Likert-type scale where the respondents can specify their stance from 1 = strongly disagree to 4 = strongly agree. The scale consists of three subdimensions, namely, “Physician/Nurse Relationship,” “Shared Education,” “Nursing Role in Patient Care,” and “Accountability and Responsibility of Nurses.”⁶⁶ Items 8 and 10 of the scale are reverse-scored. The highest score that can be obtained from the scale is 60, and the lowest score is 15. A higher total score reflects a more positive attitude toward physician–nurse collaborative relationships. The reliability coefficients for this scale for Turkish nurses and physicians were 0.75 and 0.71, respectively.⁶⁶ In the current study, Cronbach’s alpha coefficient was 0.760, indicating the acceptable internal consistency of the scale.

NPAAS. The Nurses’ Attitude Toward Professional Autonomy Scale, developed by Asakura et al. (2016),²⁴ was adapted into Turkish by Atasoy and Baykara (2020).⁶⁷ The scale consists of three subdimensions, namely, “work-related independence,” “autonomous clinical decisions,” and “control over working conditions,” and 18 items. The items of the scale were scored using a 5-point Likert-type scale ranging from “I strongly disagree” to “I strongly agree.” “Strongly agree” indicates the most liberal attitude toward professional autonomy for nurses, while “strongly disagree” indicates the most conservative attitude. The lowest score that can be obtained from the scale is 18, and the highest score is 90. Higher scores indicate that nurses have autonomous behavioral attitudes. In Atasoy and Baykara’s (2020) study, the Cronbach’s alpha coefficient of the NPAAS was $\alpha = 0.847$. In the current study, Cronbach’s alpha coefficient was 0.905, indicating the high internal consistency of the scale.

Dempster practice behaviors scale. The Dempster Practice Behaviors Scale was developed by Judith Dempster (1990) to measure autonomy behaviors in practice.⁶⁸ The scale consists of three subdimensions, namely, “readiness,” “empowerment,” “actualization,” and “valuation,” and 30 items. This scale is rated using a five-point Likert scale from 1 = not at all true to 5 = extremely true. The scale score ranges from 30 to 150, with four items reversed scored. Higher scores indicate a greater extent of autonomy in practice. The DPBS was validity, reliability analyses and cross-culturally adapted into Turkish by Sonmez et al. (2016) on 332 nurses.⁶⁹ As a result of the analyses made from the original scale consisting of thirty items, 15 items were

removed, and a structure with 15 items and three subdimensions (professional behavior, independent behavior, and decision-making) was obtained. The total scores of the Turkish version of the DPBS range from 25 to 75; a higher score indicates a greater extent of autonomy. According to Sonmez et al. (2016), the Cronbach's alpha coefficient of the DPBS was $\alpha = 0.857$, and that of the subscales ranged between 0.666 and 0.874. In the current study, Cronbach's alpha coefficient was 0.867, indicating the high internal consistency of the scale. Field (2009) defined Cronbach's alpha values of 0.70 and above as acceptable.⁷⁰

Data analysis

The data analysis was conducted using IBM's SPSS (SPSS Inc., Chicago, IL, USA) 24.0 software package and the Process Macro 4.0 plug-in software developed by Hayes (2013). First, outlier analysis was performed by calculating total scores. For this purpose, standard Z scores were calculated for each variable. The Z score is a standard score that shows how many standard deviations each participant is away from the mean score of all participants. Z scores were calculated on the application by selecting the "Save standardized values as variables" option in the Descriptives tab of the SPSS program. Participants whose Z scores were outside the range of $[-3.29, 3.29]$ on any scale were considered outliers (10 participants) and excluded from the data.⁷⁰ Then, the skewness and kurtosis values were examined to determine whether the independent variables met the normality assumption. Since these values were within the limits of -1 and $+1$ for all variables, it was decided that the data were usually distributed.⁷¹ Next, Pearson's product-moment correlation coefficients were calculated to measure the relationships between the scales. Pearson correlation analysis results are given to show how our research variables are related. Finally, the accuracy of the hypotheses determined within the scope of this study was tested. In this context, to determine the mediating effect of Physician-Nurse Collaboration (PNC) on the relationship between Practice Behaviors (PBs) and Nurse Professional Autonomy (NPA), a mediating analysis was conducted using Model 4 in the Process Macro plugin. The process macro examines mediating models with the bootstrapped method. We adopted a bootstrapping approach with 5000 sample sizes to estimate indirect effects. Standardized regression coefficients and p values are reported. Estimates without zero in the 95% confidence interval (CI) indicated that the mediation effects were significant.⁷² Independent sample t test and one-way ANOVA were used to examine nurses' levels of professional autonomy, physician-nurse collaboration, and practice behaviors according to demographic variables.

Ethical considerations

Permission to use the questionnaires in the study was obtained via email from the corresponding authors. The study was approved by the ethics committee of Sabahattin Zaim University on August 31, 2022 (approval number 2022/07) and was conducted in accordance with the Declaration of Helsinki (1989).

Results

Descriptive findings regarding scales

The means, standard deviations, tolerances, variance inflation factors (VIFs), and Pearson correlation analysis results of the variables are shown in [Table 2](#).

This study tested the mediating effect of physician-nurse collaboration on the relationship between nurses' professional autonomy and practice behaviors. Additionally, all variables included in the analysis were tested for suitability for regression analysis.

The skewness of the variables is between -0.27 and 0.16 , and the kurtosis is between -0.87 and -0.30 . Therefore, since these values are between -1 and $+1$, it is accepted that the variables are normally

Table 2. Pearson correlation analysis and descriptive statistics.

Descriptive statistics					Pearson correlation analysis			
Variables	Mean $\pm$ SD	Min/Max	Tolerance	VIF	Managerial position	PNC	NPA	PBs
1. Managerial position	0.23 $\pm$.42	0.00/1.00	0.97	1.04	1	0.09	−0.10	0.12*
2. PNC	48.98 $\pm$ 4.22	37.00/58.00	0.77	1.30		1	0.46*	0.42*
3. NPA	73.72 $\pm$ 10.17	44.00/90.00	0.77	1.31			1	0.46*
4. PBs	60.52 $\pm$ 7.60	41.00/75.00						1

* $p < .05$.

distributed.⁵⁷ Since managerial position significantly affected the predicted variable of practice behaviors, managerial position was coded as a dummy variable and included as a control variable in the mediating analysis. Although there is no significant relationship between managerial position, which is included in the analysis as a control variable, and PNC and NPA, there is a significant positive relationship at the 0.12 level with PBs ($p < .05$). The Pearson correlation coefficients calculated for the relationships between variables are between 0.46 and 0.42, and these values show no multicollinearity between variables.⁷⁰ The VIFs of the variables are between 1.04 and 1.31, and the tolerance values are between 0.77 and 0.97. These values indicate that there is no multicollinearity problem among the variables.⁷¹ After the assumptions were tested, the mediating analysis phase began. Hayes' Process Macro plug-in for SPSS was used for the analysis. The process macro examines mediating models with the bootstrap method, and within the scope of this research, 5000 bootstraps were selected with a 95% confidence interval, and analyses were conducted.⁷²

Difference analysis

According to the results of the independent sample t test, the three scales did not significantly differ between groups in terms of sex, PNC score ($t_{(52,411)} = 1.311, p > .05$), NPA score ($t_{(293)} = -0.204, p > .05$) and PBs score ($t_{(293)} = 0.248, p > .05$). There were no significant differences in marital status, PNC score ($t_{(293)} = 1.493, p > .05$), NPA score ($t_{(293)} = -0.990, p > .05$), and PBs score ($t_{(293)} = -1.115, p > .05$) between the three groups.

Additionally, according to the one-way ANOVA results, the three scales did not significantly differ in terms of educational status, PNC scores ($F_{(3, 291)} = 0.515, p > .05$), NPA scores ($F_{(3, 291)} = 2.505, p > .05$), and PBs scores ($F_{(3, 291)} = 0.679, p > .05$). The one-way ANOVA revealed that the three scales did not significantly differ between groups in terms of the institution type, PNC scores ($F_{(4, 290)} = 1.277, p > .05$), NPA scores ($F_{(4, 290)} = 0.904, p > .05$), and PBs scores ($F_{(4, 290)} = 0.102, p > .05$).

According to professional working years, there were no significant differences between NPA scores ($t_{(293)} = 0.193, p > .05$) and PBs scores ($t_{(293)} = -1.217, p > .05$). PNC scores for professional working years ≤ 5 years ($M = 74.90, SD = 9.74$) were significantly greater than those for professional working years > 5 years ($M = 72.51, SD = 10.50$) ($t_{(293)} = 2.032, p < .05$).

According to managerial position, there were no significant differences between NPA scores ($t_{(293)} = -1.757, p > .05$) and PNC scores ($t_{(293)} = 1.580, p > .05$). The PBs scores of the nurse managers ($M = 62.22, SD = 7.56$) were significantly greater than those of the non-manager nurses ($M = 60.00, SD = 7.55$) ($t_{(293)} = 2.131, p < .05$).

Mediating analysis

The present study analyzed the direct, indirect, and total effects of the model. The model in which nurses' professional autonomy is the predictor variable, physician–nurse collaboration is the mediating variable,

practice behaviors are the predicted variable, and managerial position is the control variable is statistically significant ($F_{(2, 292)} = 46.71$, $p < .001$). The model also explained 24% of the observed change in practice behaviors ($R = 0.49$, $R^2 = 0.24$). The effect of managerial position on practice behaviors is statistically significant ($B = 3.09$, $SE = 0.92$, $t = 3.37$, $p < .05$, 95% CI [1.2838, 4.8946]).

The total effect, direct effects, and indirect effects of the model are shown in Table 3. The total effect was examined, and the total effect of nurses' professional autonomy on practice behaviors was significant ($B = 0.36$, $p < .001$). The direct effects were analyzed; nurses' professional autonomy positively and significantly predicted physician–nurse collaboration ($B = 0.27$, $p < .001$). Nurses' professional autonomy positively and significantly predicted their practice behaviors ($B = 0.20$, $p < .001$). Physician–nurse collaboration positively and significantly predicted practice behaviors ($B = 0.44$, $p < .001$). The indirect effects were analyzed; nurses' professional autonomy on practice behaviors through physician–nurse collaboration was found to be significant (point estimate = 0.086, 95% CI [0.043, 0.135]).

The findings of the mediating analyses of the model are shown in Figure 2.

Discussion

The current study examined the mediating effect of physician–nurse collaboration on the relationship between nurses' professional autonomy and practice behaviors in a sample of 295 nurses from private and public health institutions in Istanbul, Türkiye. In addition, this study examined nurses' professional autonomy levels, physician–nurse collaboration, and practice behaviors according to demographic variables. In this section, limitations are explained, the main findings are interpreted, and recommendations are given.

In the current study, we did not find a statistically significant difference between demographic variables such as gender, graduation degree, and institution type. However, we found a statistically significant difference between the PNC (i.e., a criterion for collaboration) scores of individuals in the group with less than 5 years of work experience and individuals in the group with more than 5 years of work experience.

Table 3. The model's total effect, direct effects, and indirect effects coefficients.

			B	SE	t	p
Direct effect						
Managerial position ^a			3.09	0.92	3.37	0.000*
Nurses' professional autonomy	→	Physician–Nurse collaboration	0.27	0.04	6.43	0.000*
Nurses' professional autonomy	→	Practice behaviors	0.20	0.02	9.23	0.000*
Physician–Nurse collaboration	→	Practice behaviors	0.44	0.10	4.30	0.000*
Total effect						
Nurses' professional autonomy	→	Practice behaviors	0.36	0.04	9.36	0.000*

Independent variable	Mediating variable	Dependent variable	Point estimate	SE	95% bootstrapped CI	
					Lower	Upper
Indirect effects						
Nurses' professional autonomy	Physician–Nurse collaboration	Practice behaviors	0.086	0.023	0.043	0.135

* $p < .001$

^aControl Variable, CI: Confidence interval. Based on 5000 bootstrapped samples, standardized indirect effects = 95% CI does not include zero.

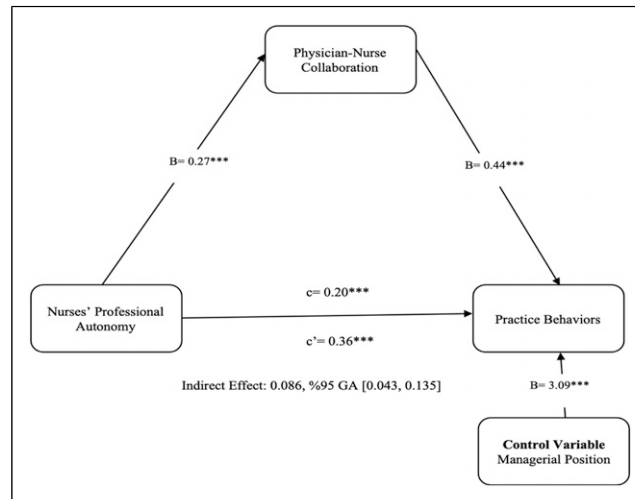


Figure 2. Model coefficients (c: total effect, c' = direct effect, *** $p < .001$).

A review of the literature revealed that there is no relationship between work experience and attitudes toward nurse–physician collaboration.⁷³ However, another study showed that as the number of years of experience increased, the likelihood of doctors and nurses collaborating increased.^{74,75} These findings are contrary to the findings in our study.

We thought that this result was due to generational differences. We interpreted that younger employees from Generation Z were more open to collaboration. Our findings showed that the total effect of nurses' professional autonomy on practice behaviors was significant. Nurses' professional autonomy significantly positively predicts their practice behaviors. According to a study on autonomy in nursing, nurses with professional autonomy do not hesitate to take risks and can implement practices using their own professional judgment instead of seeking permission for every action.⁷⁶

Mohsen et al. (2019) stated that limiting the autonomy of nurses restricts their ability to make decisions and take action in situations where quick and critical decisions need to be made.⁷⁷ In fact, professional autonomy motivates nurses to apply their knowledge and skills and promote professionalism.³⁰

Nurse autonomy positively and significantly predicts physician–nurse collaboration. In a study conducted by Parizad et al. (2021) on 398 intensive care nurses, it was found that there was a positive relationship between nurse autonomy and physician–nurse collaboration.⁵⁶

Physician–nurse collaboration positively and significantly predicted practice behaviors. Collaboration with physicians has profound effects on nurses' professional autonomy, and nurses who feel empowered by collaborating with physicians are more likely to think critically and provide high-quality care.¹⁵

In addition, the mediating effect of physician–nurse collaboration on the relationship between nurses' professional autonomy and practice behaviors is significant. Effective physician–nurse communication is essential for providing the best medical care to patients. Nurses may feel more confident about participating in interprofessional collaborative practices if they have control over their own practice and have the autonomy to make patient care decisions.⁷⁸ Georgiou et al. (2017) observed a positive relationship between collaboration and satisfaction with care decisions and autonomy. Considering that the physician–nurse relationship is complementary and that this cooperation affects nurses' work, a teamwork approach should be adopted in professional practice.²⁰ Nurse–physician collaboration appears to support nurses' autonomy and repairs power relations in clinical interactions.⁷⁹

The findings of the present study regarding the relationship between nurse autonomy and physician–nurse collaboration is in line with the findings of Papathanassoglou et al., who investigated professional autonomy,

collaboration with physicians, and moral distress among European intensive care nurses.⁸⁰ They identified a correlation between professional autonomy and nurse/physician collaboration. Some studies in the literature suggest that weak collaboration and conflicting relationships between nurses and doctors may undermine nurses' autonomy.^{81,82} There is evidence in the literature suggesting a positive relationship between the level of autonomy in clinical practice among emergency department nurses and the strength of nurse–physician collaboration.^{83–85}

Approximately one-third of the nurses involved in this study were employed at the training and research hospital. Many studies provide evidence that nurses in large hospitals are supported by management and that their working environments are regulated in various aspects, including their positions within the hospital and their freedom at work.⁸³ Working in large hospitals such as education and research hospitals helps hospital administrations and physicians understand and accept nurses' role in patient care. Thus, it contributes to a better sharing of responsibilities among team members in patient care and positively affects practice behaviors in patient care. "While the autonomy-oriented attitudes and practices of nurses are significant on their own, the confidence, respect, and professional acceptance brought about by the physician–nurse relationship could also explain this outcome." Research on autonomy in practice behaviors shows that participants differ based on years of experience, practice setting, presence of physician colleagues, community size, age, ethnicity, gender, etc..

Limitations and recommendations

To the best of our knowledge, this is the first study to investigate whether physician–nurse collaboration mediates the relationship between nurses' professional autonomy and practice behaviors, and the findings provide valuable information for nursing management. However, there are also some limitations in our study. First, the present study was limited in scope, as it involved data from only nurses working in a single province in Türkiye. More research in the Türkiye population is needed to generalize our findings. We recommend that future studies collect data from different provinces in Türkiye. The second limitation was related to the sample size. Although the sample in our study included nurses from various health institutions in Istanbul, it still relied on a relatively small sample size, mainly because many nurses were reluctant to complete the online survey. We recommend that future studies use a larger sample size that could better represent nurses. The third limitation was related to the sampling method. Due to time and cost constraints, a convenience sampling strategy was chosen for the current study, which may have led to bias in the sampling frame due to the lack of randomization. Moreover, causality among the study variables cannot be determined due to the cross-sectional design. Longitudinal research is needed to elaborate on the causal relationships among these variables in the future. Finally, there might be other factors that are important in explaining interprofessional collaboration between physicians and nurses but were not included in the study. Future research should explore other potential and modifiable factors from different perspectives.

Conclusion

Physician–nurse collaboration is a complex interpersonal process. When examining the literature on the attitudes of physicians and nurses toward collaboration, we observe that such studies are generally conducted in Western countries and the United States. There is limited research on attitudes toward collaboration between doctors and nurses in countries outside of this region. The findings of our study may not be directly applicable to other countries due to potential cultural and social differences. A mutual understanding of attitudes toward collaboration can serve as a first step for physicians and nurses to recognize specific challenges they encounter when working together and to identify solutions that will enhance collaboration. Since physician–nurse collaboration significantly influences nurse autonomy, nursing practice behaviors, and

patient outcomes, efforts should be made to enhance collaboration between physicians and nurses in the healthcare sector. The findings seem to highlight the importance of interdisciplinary collaboration as an approach to enhancing constructive relationships between nurses and doctors. Therefore, nurses and physicians should work together to develop a new culture of collaboration that combines the unique strengths of each discipline with the shared goal of providing quality patient care. Additionally, our findings underscore the need to create intervention programs to strengthen collaboration by emphasizing the determinants that influence nursing practice behaviors. Nursing practice behaviors and nurse autonomy are factors associated with confidence, indicating that in societies where nursing is predominantly female and traditional gender roles persist, nurses may face challenges in developing their autonomy and practice behaviors. The perceived value of the nursing profession within the sector and society shapes practical behaviors alongside personal characteristics. Hospital administrators are expected to promote a culture that prioritizes collaboration between doctors and nurses. Furthermore, our study emphasizes the need to investigate the mediating role of physician–nurse collaboration in the relationship between nursing autonomy and practice behaviors, paving the way for future research endeavors in this field.

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ORCID iD

Arzu Bulut  <https://orcid.org/0000-0001-7362-5667>

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