

Demographic and occupational factors predicting personality types among healthcare practitioners: An analysis using structural equation modeling (SEM)

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ABSTRACT

Personality significantly influences healthcare professionals' performance, interpersonal communication, and stress management. While existing literature suggests that individual personality traits may be shaped by demographic and occupational variables, there is a scarcity of studies employing robust statistical modeling in healthcare settings. This study aimed to investigate the structural impact of demographic factors (such as gender, academic qualification, and subspecialty) and professional variables (including workplace, work shifts, weekly working hours, and experience) on the Big Five personality traits among healthcare practitioners using Structural Equation Modeling (SEM). A total of 364 healthcare workers from hospitals, primary health care centers, and emergency clinics participated in the study, with data collected through a structured questionnaire utilizing the Big Five Inventory–2 Short Form (BFI-2-S). The analysis revealed that demographic variables accounted for 11% of the variance in the latent personality construct ($R^2 = 0.11$, $\beta = 0.326$, $p < .001$), with a statistically significant structural effect observed ($\beta = 0.326$, $p < .001$), particularly affecting Agreeableness and Open-Mindedness. In contrast, professional variables did not demonstrate a meaningful impact ($\beta = -0.079$, $p = 0.693$). Further regression analyses indicated that gender and academic qualification were significant predictors of Extraversion, Agreeableness, and Neuroticism. These findings suggest that personality is more strongly influenced by demographic background than by occupational conditions among healthcare professionals, emphasizing the importance of incorporating personality-based considerations into recruitment, supervision, and training programs within healthcare institutions. Future research should adopt longitudinal and culturally sensitive approaches to further explore these relationships in diverse clinical contexts.

Keywords: Big Five Personality Traits, Structural Equation Modeling (SEM), Healthcare Practitioners, Demographic Factors, Occupational Variables.

1. Introduction

Knowing how doctors' personalities impact their professional relationships is essential to understanding how their personality traits impact their employment decision [1]. According to research, personality is consistent over time, has an impact on professional practice, and precedes the choice of profession or specialty in several health-related fields [2, 3]. Understanding personality has aided clinicians in choosing careers by aligning occupational requirements, routines, and rewards with personality traits [4]. Personality is defined as persistent patterns of feelings, thoughts, and behaviors in various environments [5]. An individual's perspective, attitudes, and behaviors are influenced by their personality traits, which in turn influence how they respond to a crisis or disagreement. To better understand profession-specific strengths and weaknesses, promote mutual understanding, inform professional practice support strategies, and enhance interprofessional practice, it may be helpful to examine personality similarities and differences across health professions [6]. Research has focused on work outcomes, occupational types, and personality traits. The Five-Factor Model of personality moderately correlates with Holland's occupational types, extraversion and enterprising, as well as openness and artistic [7]. Social intelligence mediates the impact of personality-occupational types on nurses' work-life



quality. The systems thinking abilities of practitioners are influenced by their personalities and demographics [8, 9]. Personality traits, behavior styles, and emotional intelligence were found to vary and be homogeneous among health professionals in a systematic assessment; the majority had average to above-average scores [10]. The work behavior of healthcare professionals is influenced by extraversion, neuroticism, and conscientiousness. Significant differences in characteristics are found among the medical, nursing, dental, and allied health professions, according to a recent meta-analysis [10]. Personality traits influence how people view, engage with, and adapt to their surroundings. Given the need for interpersonal sensitivity, emotional control, and pressured decision-making, an understanding of personality is essential in the healthcare industry [11]. Numerous empirical studies have looked at how occupational and demographic traits relate to predicting the personality traits of healthcare professionals. Many of these studies have used regression or correlation models, which may not accurately capture the complexity of observed-latent variable relationships. Researchers can more accurately and validly investigate a variety of latent construct correlations by using structural equation modeling, or SEM [12]. Numerous studies have found strong correlations between personality traits and occupational characteristics like job role, healthcare environment, years of experience, and workload, as well as demographic factors like gender, age, education level, and marital status. In a cross-sectional study of healthcare workers [9].

Conscientiousness was positively correlated with experience ($\beta = 0.24$, $p < 0.01$), while female practitioners had higher neuroticism scores ($\beta = 0.31$, $p < 0.05$). These results demonstrate how clinical personality traits are shaped by both biological and sociocultural processes. Numerous domains of cognitive functioning are associated with personality traits. Researchers discovered the Big 5 most common personality traits after looking at a large number of individuals from various nationalities and genders. Openness, conscientiousness, extroversion, agreeableness, and negative emotionality are listed by [13]. To exchange energy, extroverts engage with others and their surroundings. They are gregarious, enjoy learning, and take initiative in their relationships and at work [14]. On the other hand, introverts concentrate on their emotions and thoughts. They prefer to communicate and learn through writing and reflection. Some researchers study these cognitive abilities and personality traits. They discovered that by making people more sensitive to rewards from outside sources, extroversion may enhance cognitive function and promote diligence. Additionally, extroversion raises positive affect, which seems to significantly change cognitive function [4]. In this extensive study (Willroth et al., 2023), the Big Five personality traits and healthcare utilization were investigated in 15 samples ($N = 358,803$). Dentist visits were higher among those who were less neurotic and more conscientious, agreeable, extraverted, and open. More hospitalizations and visits to general practitioners were linked to higher neuroticism and lower conscientiousness and agreeableness. The findings, which were modest but consistent, demonstrated that personality traits influence healthcare use in different ways. In 2010, 206 Slovak paramedics, nurses, and emergency dispatchers (22.3%) (Mean age 39.4) were evaluated for correlations between Big Five qualities, sensation seeking, and emotion-regulating health habits (smoking, drinking, and exercise). Openness was modestly associated with alcohol usage and physical exercise, while most personality traits were not. Sensation seeking was positively associated with all behaviors, healthy and bad, suggesting that highly sensation-seeking people may benefit from stimulating health interventions as safer alternatives to dangerous behaviors.

Boussemart et al. in 2016 examined 161 doctors' personalities and job choices using the Process Communication Model [1]. Academics focused on reasoning and grasping topics, while private practitioners focused on people and wanted recognition. The correlation between personality and career path raises the question of whether personality influences specialized choices. Medical experts and students may communicate better. Environmental and work stress also influence the personalities of healthcare workers. A SEM study of 1,426 Ethiopian healthcare personnel [15], indicated that work-family conflict ($\beta = 0.306$) and job demands ($\beta = 0.186$) increased burnout risk. However, social support ($\beta = -0.178$), suitable rewards ($\beta = -0.170$), and occupational control ($\beta = -0.133$) were found to increase emotional stability and resilience. Understanding neuroticism, emotional dysregulation, and occupational qualities requires consideration of the factors mentioned earlier.

SEM has also examined how personality affects healthcare decisions and performance (Paiva et al., 2025) examined personality and missing nursing care in 296 nurses. According to the SEM analysis, neuroticism was favorably connected with MNC incidence ($\beta = 0.14$; $p = 0.03$), while conscientiousness was inversely correlated ($\beta = -0.16$; $p = 0.03$). The model's fit indices (CFI = 0.93, RMSEA = 0.04) supported the structural pathways hypothesis. These findings imply that personality variables may affect employment success psychologically and behaviorally.

This study examined 260 healthcare workers' personality qualities and work-family conflict management [8]. According to SEM analysis, openness negatively predicted conflict ($\beta = -0.125$, $p < 0.05$), whereas neuroticism positively predicted it ($\beta = 0.320$, $p < 0.001$). Persona explained 12% of the difference. Nurses reported less conflict than doctors. The authors of [10] examined and analyzed 321 papers on health care workers' personality, behavior, and emotional intelligence. When studying personality (the most researched feature) and emotional intelligence (average or above average), researchers identified variances and similarities between professionals. Non-cognitive qualities may predict job success. Neuroticism, openness, and SES explained 85% of death rates and 80% of health hazards in 48 U.S. states using SEM. These features indirectly affected death rates by making individuals unwell, which could have affected public health results. The authors of [16] believe TCM personality factors can impact nurses' views on workplace violence (WPV) and mental health. A 2024 study of 2,788 nurses discovered three depression stages. Taiya increased WPV's effect on depression in structural equation modeling, while Taeyang, Shaoyang, and Balanced characteristics decreased it. Personality strength affected these consequences. The study found that matching nurse employment to personality types and boosting adaptive skills boosts psychological resilience.

Recent research has examined how employment and demographic characteristics affect healthcare workers' personalities. Many structural equation modeling (SEM) studies have demonstrated that age, gender, education, experience, and job specialty indirectly affect personality development in social and organizational settings. Societal factors influence nurses' demographics and personalities. Workplace context matters because personality characteristics are linked to professional background and specialization [12] claims that team diversity, training, work environment, and demographics affect personality traits. Recent research has investigated the impact of demographic and professional factors. The authors of [19] discussed the personalities of healthcare workers. These factors and psychological qualities affect work, health, and clinical performance. A multi-site European study [17] examined the decision-making confidence of emergency care professionals based on their experience and education. Openness and conscientiousness determined how age and experience affected judgment, according to SEM. These findings support the premise that personality traits are psychological resources that fluctuate with personal and job conditions. This November 2021–January 2022 convenience-sampled cross-sectional survey included 406 Lebanon-based medical professionals [18]. To assess their personalities and mental talents, participants administered the Fact Cog and Big Five Inventory-2 (BFI-2). Individuals with negative emotional traits exhibited lower cognitive function even after accounting for demographic and professional characteristics. However, extraverted and conscientious people had greater cognition, a comprehensive SEM-based model could explain how demographics and work affect personality development. This strategy would aid hiring, focused professional development, stress management, and HR leadership training. Psychological profiles and occupational metrics can indicate whether doctors are fatigued, wish to quit, or worry about patient safety [10, 12]. Research on the personalities and decision-making patterns of healthcare workers has revealed much. Being neurotic increases work-family conflict, but being open and cooperative decreases it [8]. Extraversion, conscientiousness, and openness make organizations trustworthy and supportive. Structure-seeking predicts vigilant decision-making, while extraversion predicts non-vigilance. Needing order and being neurotic might lead to impulsive judgments, suggest [20]. More conscientious, open, and less agreeable and neurotic people make active healthcare decisions [21]. These findings imply that personality features affect healthcare personnel' work-life balance, organization perception, and decision-making. Knowing how these things relate helps improve healthcare discussions and patient care. Therefore, the present study aims to construct a comprehensive SEM model to examine how demographic (gender, age,

academic qualification) and occupational (job title, years of experience, work hours) factors influence the Big Five personality traits among healthcare practitioners. The study uses a representative sample and validates the model through goodness-of-fit indices such as the Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI), and Chi-square (χ^2) to ensure statistical robustness and theoretical coherence, despite these advances, significant research gaps remain. Most existing studies have examined demographic or occupational factors in isolation, often failing to account for their combined influence or potential interaction effects. Furthermore, relatively few studies have examined how these predictors shape all five major personality traits simultaneously. This gap is particularly relevant in healthcare contexts where multiple personal and professional pressures intersect, often in high-stakes environments such as emergency care, oncology, or intensive care units.

2. Methodology

This study adopted a descriptive-analytical cross-sectional design to explore the demographic and occupational characteristics of healthcare professionals and analyze the relationships among selected variables. This design is suitable for examining associations and differences across groups at a single point in time without manipulating study variables. The sample included 364 hospital, primary care, and emergency clinic workers. Stratified random sampling ensured that gender, job title, educational level, years of experience, specialty, shift pattern, and weekly working hours were all represented proportionally. Working at a healthcare facility as a nurse, doctor, or assistant technician with at least one year of experience was required. Participants have to give voluntarily informed permission after being instructed on the study's protocol. Participants who did not match these requirements or declined were eliminated from the final sample.

The sample was 46.4% male and 53.6% female. Physicians (24.7%), nurses (21.4%), and assistant technicians (53.8%) held job titles. 25.8% had diplomas, 58.8% bachelors, and 15.4% postgraduate degrees. Experience varied: 47.5% had less than 5 years, 30.8% had 5–10 years, and 21.7% had more than 10 years. General medicine and surgery (35.4%), nursing (53.6%), and laboratory, radiology, or psychology (11.0%) were subspecialties. Participants worked night shifts (33.8%), day shifts (36.8%), or both (29.4%) for fewer than 30 hours (21.7%), 30–45 hours (49.7%), or more than 45 hours (28.6%).

Table 1. Distribution of the Study Sample According to Demographic and Professional Characteristics (N = 364)

Variable	Category	Frequency	Percent (%)
Gender	Male	169	46.4
	Female	195	53.6
Job Title	Nurse	78	21.4
	Physician	90	24.7
	Assistant Technician	196	53.8
Academic Qualification	Diploma	94	25.8
	Bachelor's Degree	214	58.8
	Postgraduate Studies	56	15.4
Years of Experience	1–5 years	173	47.5
	More than 5 and less than 10 years	112	30.8
	More than 10 years	79	21.7
Subspecialty	General/Internal Medicine, General Surgery	129	35.4
	Nurse	195	53.6
	Laboratory, Radiology, or Psychology	40	11.0
Working Shifts	Night	123	33.8
	Day	134	36.8
	Both	107	29.4

Variable	Category	Frequency	Percent (%)
Weekly Working Hours	Less than 30 hours	79	21.7
	30–45 hours	181	49.7
	More than 45 hours	104	28.6
Workplace	Hospital	176	48.4
	Primary Health Care Center	106	29.1
	Emergency Clinic	82	22.5

You see the demographic and occupational breakdown of the healthcare professionals that took part in the study in this table. There are 364 participants in the sample, with a minor gender bias favoring female (53.6%). With 53.8% of the total, assistant technicians were the most common occupation, followed by doctors with 24.7% and nurses with 21.4%. Among the participants, 58.8% had a bachelor's degree, and 47.5% had between one and five years of work experience. There was a sizable contingent of nurses practicing general/internal medicine or general surgery, making up 53.6% of the total. The distribution of shift work was very even; 29.4% worked nights, 33.8% days, and 36.8% alternated between the two. Nearly half of the people who took part in the study worked 30–45 hours a week. Workers at primary care clinics made up 29.1% of the workforce, those in hospitals 48.4%, and those in emergency rooms 22.5%. Insights on professional patterns and personality tendencies can be extrapolated from this distribution, which showcases a diverse sample representing different roles and circumstances within the healthcare system. Data collection was carried out using a structured questionnaire developed for the purpose of this study. The instrument included two sections: the first covered demographic and occupational information, while the second focused on the study variables of interest. A structured questionnaire was used to gather data, consisting of two main sections:

1. sociodemographic and occupational variables (gender, job title, education, experience, specialty, shifts, hours, workplace), and
2. This study used the **Big Five Inventory–2 Short Form (BFI-2-S)** to achieve its aims. It was created by [25] This brief version is one of the most popular and current Big Five personality test products. This condensed version was created to be practical and simple for field and workplace use without compromising results reliability. The scale has 30 statements measuring five primary personality traits, with six statements per dimension and sub-trait.

The BFI-2-S was selected for this study due to its practicality and suitability for field and occupational research settings where efficiency is essential. Although shorter than the full version, the instrument has demonstrated strong psychometric properties, as confirmed by expert review and pilot testing, which yielded high internal consistency ($\alpha = 0.87\text{--}0.95$). While acknowledging that its brevity may limit the detection of very subtle variations in personality, the scale is considered appropriate for the study's aims.

Each statement is rated on a five-point Likert scale from 1 = strongly disagree to 5 = strongly agree. The scale has reverse-keyed items that require scoring in reverse to assure statistical accuracy. Items were allocated as follows: The extraversion dimension evaluates activity, sociability, and assertiveness with items (1, 6, 11, 16, 21, 26), three of which are reversed. Agreeableness measures trust, empathy, and respect with items (2, 7, 12, 17, 22, 27), three of which are reversed. The conscientiousness dimension includes organization, self-discipline, and reliability (3, 8, 13, 18, 23, 28), three of which are inverted. Negative Emotionality evaluates anxiety, depression, and emotional volatility with items (4, 9, 14, 19, 24, 29), three of which are reversed. Final items in the Open-Mindedness dimension measure creativity, abstract thinking, and aesthetic sensibility (5, 10, 15, 20, 25, 30), three of which are reversed. Reversing negative item scores (reversed score = 6 - original score) and summing the modified values for each dimension to get the overall score is the corrective method. The structural model of personality calculates five primary scores for the Big Five qualities instead of a single scale score since each

dimension is an independent variable. Studies utilizing the BFI-2-S have indicated that it has good psychometric qualities, with Cronbach's Alpha ranging from 0.78 to 0.82. It also agreed well with the entire scale, making it a viable instrument for psychological and professional studies. Academic experts examined the questionnaire for content validity and pilot-tested it on a subsample for clarity and reliability. The scales' Cronbach's alpha values were 0.87–0.95, showing strong internal consistency.

The appropriate institution's IRB authorized this study. Participants were informed of the study's goal, protocols, voluntary nature, and confidentiality. Anonymity was maintained during data collection and processing, and all participants gave informed consent. Participants were told they could quit the study without penalty.

Data analysis was done using Jamovi (version XX), an open-source statistical software with advanced classical and current statistical capabilities. The sample's demographic and occupational characteristics were summarized using frequencies, percentages, means, and standard deviations. Jamovi's Structural Equation Modeling (SEM) module was used for inferential analyses of latent and observable variables in the study model. SEM allowed simultaneous measurement and structural route testing, revealing crucial constructions' direct and indirect impacts. The model's fit was evaluated using CFI, TLI, RMSEA, and SRMR. A p-value threshold of < 0.05 was used to evaluate statistical significance.

3. Results and discussion

The effect of demographic variables (gender, subspecialty, academic qualification) on the personality dimensions of healthcare practitioners.

This table presents the overall fit indices for the structural equation model. The SRMR (0.048) and RMSEA (0.055) fall within acceptable thresholds, indicating reasonable approximation fit. Both the CFI (0.912) and TLI (0.901) exceed the conventional cut-off value of 0.90, suggesting a good incremental fit. The NFI (0.884) and IFI (0.915) further confirm the adequacy of the model fit for exploratory analysis in psychological and occupational research.

Table 1. Model fit indices

SRMR	RMSEA	CFI	TLI	NFI	IFI
0.048	0.055	0.912	0.901	0.884	0.915

This table illustrates the structural relationship between the latent variable "Demographics" and "Personality". The path coefficient ($\beta = 0.326$) is statistically significant ($p < .001$), suggesting that demographic variables have a positive and meaningful impact on the latent personality construct.

Table 2. Structural path estimates

Latent Variable	Predictor	β	z / p
Personality	Demographics	0.326	5.408 / $< .001$

This table shows the factor loadings of each personality dimension on the latent variable "Personality". Agreeableness and Open-Mindedness contributed significantly, while Conscientiousness and Negative Emotionality did not show statistically significant contributions.

Table 3. Measurement model and personality dimensions

Dimension	Estimate	β	z	p
Extraversion	1.000	0.4501	-	-
Agreeableness	1.601	0.6229	4.668	$< .001$
Conscientiousness	0.054	0.0205	0.351	0.726
Negative Emotionality	0.027	0.0144	0.239	0.811
Open-Mindedness	0.423	0.1630	2.295	0.022

Figure 1 shows the structural equation model examining the predictive relationship between a latent demographic construct (gender, academic qualification, and subspecialty) and the latent personality construct (extraversion, agreeableness, conscientiousness, negative emotionality, and open-mindedness). Demographics substantially predict personality ($\beta = 0.326, p < .001$). The latent variable loaded most on Agreeableness and Open-Mindedness, suggesting they are the most demographically sensitive personality traits.

The model fits well (SRMR = 0.062, RMSEA = 0.078), indicating structural validity. The model was estimated using Jamovi's Maximum Likelihood technique with standardized solutions and fixed latent construct initial indicators.

SEM was used to study how professional characteristics affect personality traits. Four observable indicators, workplace, work shifts, weekly working hours, and years of experience, formed the second-order factor Professional. Similarly, latent construct Personality was modeled using the Big Five personality dimensions: extraversion, agreeableness, conscientiousness, negative emotionality, and open-mindedness. After verifying the measurement model, the structural path between the two latent variables was examined to identify the impact of professional aspects on personality. Key model explanatory results are shown in the following tables.

Table 5 shows the structural path estimate between professional, workplace, work shifts, weekly hours, and experience, and personality. The computed standardized coefficient ($\beta = -0.079, p = 0.693$) was non-significant and negative. This suggests that professional characteristics do not predict personality traits in the proposed model. The near-zero impact size and high p-value show that professional environment factors do not explain personality variance. This may suggest that personality, a reasonably stable individual trait, is less vulnerable to structural occupational inequalities in the sampled group. Perhaps the professional construct was operationalized poorly or the sample was homogeneous in job-related factors.

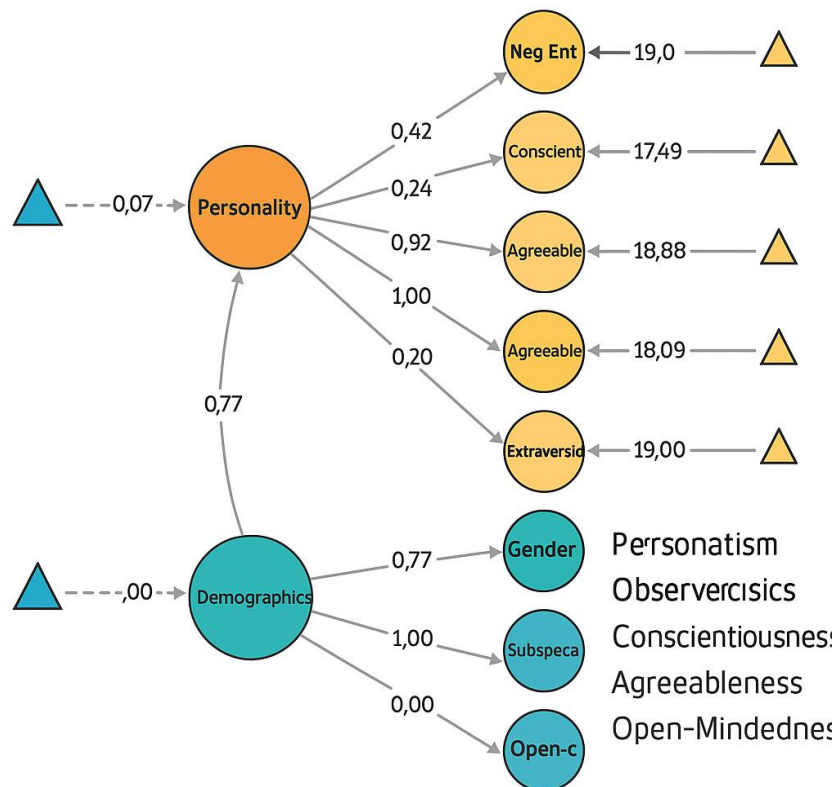


Figure 1. Structural Equation Model (SEM) linking demographic variables to personality dimensions among healthcare practitioners

Table 4 presents the fit indices of the structural model. The SRMR and RMSEA values indicate acceptable model fit, while the CFI and TLI values suggest the need for model improvement or re-specification.

Table 4. Model fit indices

Index	Value
SRMR	0.070
RMSEA	0.076
CFI	0.655
TLI	0.523

Table 5. Effect of professional variables on personality

Path	Estimate	Standardized β	p-value
Professional \rightarrow Personality	-0.014	-0.079	0.693

Table 6 indicates that only Open-Mindedness significantly correlated with the latent construct Personality ($\beta = 0.086$, $p = .015$), making it the most reliable indicator in this model. Using extraversion as the reference indicator, standardized loading was low ($\beta = 0.179$), whereas agreeableness, conscientiousness, and negative emotionality had small and non-significant impacts. Construct validity of the personality scale in the current population may be hampered by cultural or contextual differences in the measuring paradigm.

Table 6. Measurement model and personality dimensions

Dimension	Estimate	Standardized β	z-value	p-value
Extraversion	1.000	0.179	-	-
Agreeableness	9.850	1.523	0.425	0.671
Conscientiousness	0.160	0.024	0.907	0.365
Negative Emotionality	-0.019	-0.004	-0.129	0.897
Open-Mindedness	0.565	0.086	2.433	0.015

Four aspects of personality are Open-Mindedness (Opn.O), Agreeableness (Agr.O), Conscientiousness (Cnscn), and Negative Emotionality (Ngt_E). Open-mindedness loaded the most (0.42), suggesting it defined the latent construct the most. Agreeableness and negative emotionality had low loadings (0.05), raising questions about their discriminant contribution in this sample. A dashed arrow indicates a weak and negative standardized coefficient (-0.07) in the professional-to-personality structural path. This supports the statistical findings that career characteristics do not significantly predict personality trait. While the professional measurement model shows internal coherence, the weak factor loadings within personality and the non-significant path between constructs suggest that theoretical assumptions or measurement validity should be reconsidered, particularly regarding personality dimension operationalization in the studied population. Some qualities have poor measurement validity. The negative and non-significant path from professional to personality ($\beta = -0.07$) suggests professional factors did not predict personality in this model.

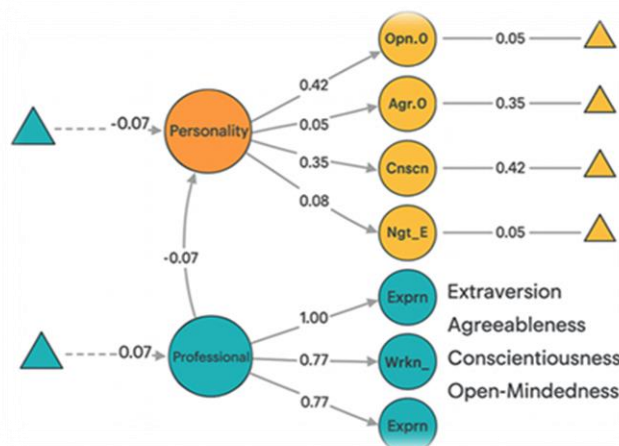


Figure 2. SEM path diagram: Professional variables and personality

Table 7. Summary of final regression models for the personality traits among healthcare practitioners

Trait	Final Model	R	R ²	Adjusted R ²	RMSE
Extraversion	M ₂	0.295	0.087	0.082	2.244
Agreeableness	M ₁	0.359	0.129	0.126	2.533
Neuroticism	M ₂	0.315	0.099	0.094	2.530
Conscientiousness	M ₀ (Intercept only)	0.000	0.000	0.000	2.814
Negative Emotionality	M ₀ (Intercept only)	0.000	0.000	0.000	2.029

This table demonstrates that explanatory variables accounted for between 8.7% and 12.9% of the variance in the first three personality traits. No significant variance was explained in Conscientiousness or Negative Emotionality, as indicated by zero values for R², suggesting that none of the tested predictors contributed meaningfully to those traits.

Table 8. ANOVA for Final Regression Models

Trait	Regression SS	df	Mean Square	F	p-value
Extraversion	173.493	2	86.747	17.233	< .001
Agreeableness	342.697	1	342.697	53.398	< .001
Neuroticism	197.310	2	98.655	15.392	< .001
Conscientiousness	,	,	,	,	,
Negative Emotionality	,	,	,	,	,

Significant F-statistics for Extraversion, Agreeableness, and Neuroticism confirm the predictive relevance of the selected variables for these traits. No meaningful ANOVA results were found for Conscientiousness or Negative Emotionality.

Table 9. Regression Coefficients for Significant Predictors

Trait	Predictor	B	Std. Error	Standardized Beta	p-value
Extraversion	Gender	1.459	0.249	0.311	< .001
Extraversion	Academic qualification	-0.393	0.196	-0.106	0.046
Agreeableness	Gender	1.946	0.266	0.359	< .001
Neuroticism	Gender	-1.419	0.257	-0.302	< .001
Neuroticism	Academic qualification	0.370	0.202	0.096	0.064
Conscientiousness	Intercept only	16.876	0.148	,	< .001
Negative Emotionality	Intercept only	17.464	0.106	,	< .001

Extraversion and agreeableness were positively correlated with gender, while neuroticism was adversely correlated. Academic qualification negatively correlated with extraversion (significant) and favorably with neuroticism (marginal). Conscientiousness and negative emotionality were not substantially predicted by demographics or career. Due to lack of statistical significance, job position, experience, subspecialty, work shifts, working hours, and workplace type were tested but eliminated from final models.

There was a statistically significant impact of specialization on the personality traits of healthcare practitioners ($\beta = 0.326$, $p < .001$). Particularly noteworthy is the fact that the characteristics of agreeableness and open-mindedness were shown to be the most sensitive to these variables. The main assumptions of trait theory, which postulates that personality is composed of relatively stable internal dispositions that are formed by early environmental and cultural experiences, are closely aligned with this. These findings also provide strong empirical support for the Big Five Theory of Personality (McCrae, 2024) which states that agreeableness is influenced by social norms and values, whereas open-mindedness is a reflection of intellectual engagement, education level, and exposure to various perspectives. This explains why open-mindedness is responsive to demographic factors.

Previous research, such as that conducted by (Alhassan et al., 2025; Louwen et al., 2023) has demonstrated that there are significant gender and educational disparities in personality traits across various healthcare professions. These findings indicate that the observed differences align with the previous research. In a similar vein, (Metoudi et al., 2025) stressed the significance of acknowledging the differences in personality when it involves developing adaptive work environments. It is possible to interpret these findings as evidence of how personality traits are influenced by observational learning, cultural models, and socialization processes within the context of (Nabavi & Bijandi, 2012). In particular, these findings may be interpreted as evidence of how personality traits such as agreeableness and open-mindedness, which are more susceptible to learned behavior and academic exposure, are influenced by these factors.

Personality traits were not significantly impacted by professional variables such as workplace setting, shift type, working hours, and years of experience ($\beta = -0.079$, $p = 0.693$). This supports trait theory, which claims that an individual's personality is largely steady throughout their lifespan and is not affected by temporary or consequential work settings. This conclusion supports Eysenck's biological model of personality, which links neuroticism and extraversion to stable neurophysiological systems. This makes these traits less adaptable and less changeable through work. Studies supporting this claim, such as those conducted by [4] demonstrate that personality traits tend to remain stable in early adulthood and are resistant to change until they are subjected to conditions that are either extreme or persistent. Furthermore, in light of Bandura's interactionist paradigm [22], the absence of professional effect may be the result of restricted cognitive-emotional involvement with the work setting or a homogenous professional environment that lowers contextual diversity. Both of these factors could contribute to the observed trends.

Further validation of these trends was provided by regression analysis. It was discovered that gender and academic qualification were important predictors of personality traits such as extraversion, agreeableness, and neuroticism. On the other hand, conscientiousness and negative emotionality were found to be without any influence. These findings lend credence to the viewpoint of [23], which posits that certain characteristics, such as conscientiousness and emotional stability, are deeply ingrained and, as a result, less susceptible to the influence of external factors. This belief is supported by research conducted by [4], which found a correlation between extraversion and improved cognitive performance and adaptability. Additionally, the researchers discovered a correlation between neuroticism and emotional reactivity and vulnerability, suggesting potential biological origins.

The findings indicated that traits such as conscientiousness and negative emotionality did not show significant effects, which can be understood in light of the theoretical stability of these traits as highlighted in prior research [23]. Moreover, while the short form of the BFI-2 is psychometrically robust, its brevity may have limited sensitivity in detecting subtle variations. The relative homogeneity of some occupational characteristics within the sample may also have reduced variance and weakened potential associations. These considerations were explicitly acknowledged in the limitations section, where we emphasized the need for future research employing more comprehensive instruments, longitudinal designs, and more diverse samples to capture fine-grained differences.

In this study, gender disparities are interpreted using Social Role Theory, According to this idea, women's greater neuroticism and agreeableness scores may reflect cultural roles that emphasize emotional sensitivity and relational harmony, However, men's higher extraversion scores may correlate with socially supported professional boldness, These findings support Bandura's theory that internal predispositions (such temperament and emotions) and external influences (like cultural roles and professional expectations) shape individual characteristics [24].

The findings of this study together offer empirical support for the integration of structural theories, such as the Big Five and Trait Theory, as well as contextual frameworks, such as Eysenck's biological model and Bandura's social-cognitive approach. This suggests that demographic factors play a foundational role in shaping

personality structure, whereas professional considerations have a minimal influence [25]. This finding reaffirms the trait-like stability of basic personality dimensions among healthcare workers.

In the present study, the significant influence of demographic factors, particularly gender and academic qualification, on traits such as Agreeableness, Extraversion, and Neuroticism aligns with prior research suggesting that personality traits are socially conditioned and gender-role mediated. For example, women tend to score higher in Agreeableness and Neuroticism due to both evolutionary and socio-emotional socialization processes [23]. Similarly, higher academic qualifications may promote openness to new experiences and better emotional regulation, reinforcing the role of education in shaping cognitive-affective personality dispositions [26]. The lack of significant influence from occupational variables may reflect the relative stability of core personality traits across different work environments, as posited by trait theorists [4]. This supports the perspective that while job demands can influence behavior, they do not substantially alter core personality structures, particularly over short to moderate timeframes.

While the study drew on trait theory, social role theory, and interactionist models, incorporating a cultural psychology perspective enriches the interpretation within the regional context. Culture shapes how traits are expressed and valued; for example, neuroticism and agreeableness in Arab collectivist societies may reflect adherence to social norms and relational harmony rather than mere individual differences [27]. This may explain why gender and education predicted certain traits, while stable traits such as conscientiousness showed no variance. The lack of significance in some traits likely reflects their stability, reinforced by both biological bases and culturally embedded professional norms [28]. Therefore, we recommend that future researches adopt fractal theories [29], longitudinal designs [30, 31], apply culturally adapted instruments to capture subtle differences [32, 33], hazy images [34], scenarios analyses [35], gender recognition [36] redundant discrete wavelet transform [37], logistic regression algorithm [38] to expand occupational diversity by to ensure broader generalizability. AI techniques can support this study [39, 40].

4. Conclusion and recommendations

This research is restricted in its ability to interpret causal relationships due to the cross-sectional form of the study. In addition, the utilization of the short-form BFI-2 may have resulted in a diminished capacity to identify small variations in personality characteristics. Additionally, there was insufficient variation across the occupational factors that were included in the sample. It is possible that certain SEM model fit indices were not ideal, which may have reflected issues with measurement validity within the cultural setting.

One limitation of this study concerns the use of the BFI-2-S. Although this short form is widely recognized for its efficiency and reliability in psychological and occupational research, its brevity may reduce sensitivity to very subtle variations in personality traits, particularly across culturally diverse populations. However, this limitation was partly mitigated by expert review, pilot testing, and the application of advanced statistical techniques (SEM) to ensure construct validity. Future research may consider using the full BFI-2 or alternative comprehensive measures to capture finer-grained personality differences,

The lack of significant findings for traits such as conscientiousness and negative emotionality may reflect both their stable theoretical nature, as documented in the literature, and the reliance on the short form of the BFI-2, which, although reliable, may be less sensitive to subtle distinctions. Furthermore, sample homogeneity likely reduced variance in these traits. The cross-sectional design further restricts causal inference, and the use of self-reported measures may introduce bias; however, confidentiality assurances and high internal consistency minimize this risk. These issues were also discussed in the manuscript and reiterated here to highlight the importance of interpreting results cautiously and the necessity for future studies with longitudinal approaches and culturally diverse samples. Longitudinal studies that utilize more comprehensive personality tests are recommended. In addition, it is important for future study to take into consideration the fact that personality measurement methods should be adapted to be culturally sensitive.

Declaration of competing interest

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

Author contributions

The author has written and revised the whole paper.

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