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The influencing factors of newly employed nurses' adaptation in Malaysia: a structural equation modelling assessment

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Abstract

Background Graduate nurses commonly experience the transition phase and are required to adapt quickly to their new workplace, as it is a prerequisite for a successful transition. However, workplace adaptation is extremely challenging and may affect nurses' future career prospects if not managed properly. Therefore, we aimed to determine the factors that facilitate newly employed nurses' adaptation and integration at Ministry of Health (MOH)-run state hospitals in Malaysia. The study framework was derived and adapted from the Roy adaptation model and organisational socialisation theories.

Methods This quantitative study was conducted from May 2021 to December 2021. The sample population was newly employed nurses working at state hospitals with 1–2 years of service experience. This study involved 496 newly hired nurses from MOH state hospitals. Questionnaires were distributed through Google Forms. The data were analysed using covariance-based structural equation modelling.

Results The participants perceived that workplace organisation (OC), academic institution contribution (AIC), and new nurse's personality traits (PT) contributed approximately 36% to newly employed nurses' adaptation (NENA). PT partially mediated the relationship between OC and NENA and between AIC and NENA.

Conclusions The results could be useful to nursing authorities. We also recommend that a nurse's personality be developed, emphasised, and enhanced through continuous programmes or training to ensure that they can easily adapt to their new working environment. Furthermore, academic institution and work organisation collaboration should be encouraged to develop improvement cycles that facilitate newly employed nurses' prompt and efficient adaptation at MOH hospitals during transition.

Keywords Adaptation, Organisation, Academic, Personality, Structural equation modelling

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Background

Reality shock or 'shock-like reaction' refers to the strong feelings of anxiety and stress experienced by newly employed nurses [1]. New nurses experience pressure, trauma, and anxiety during the transition period as they cannot adjust to, integrate into, or socialise within the new organisation [2]. Many studies have focused on newly employed nurses' transition, which involves major changes between one phase and another [3]. The organisational socialisation theory states that transition involves three stages: (1) new employee behaviour, characteristics, and organisational efforts; (2) newcomer adjustment from being an outsider to an insider; and (3) the relation to adjustment outcomes, which include job satisfaction, performance, turnover rate, and commitment [4]. The adaptation phase is critical and determines new employees' successful transition. Asking what determines a successful transition from student to registered nurse is crucial. Nevertheless, effective adaptation is likely to determine newly employed nurses' successful transition. This view was supported by a study of adolescents' vocational transition, which highly adaptable adolescents attained successfully [5]. The Roy adaptation model (RAM) indicates that individuals integrate human and environmental stressors using their conscious awareness [3]. Thus, a stable equilibrium between ecological factors and the internal system would result in newly employed nurses' effective adaptation.

In their first year of practice, new nurses are assisted by transition support programmes. Some countries use strategies and programmes that include WhatsApp community practices [6, 7], extended orientation [4, 8–12], nurse residency programmes (NRP) [13, 14], nurse transition programmes (NTP) [15–17], introductory programmes [18], and mentoring programmes [19–21]. These initiatives are vital to prepare new nurses to face workplace environment challenges and culture.

In Malaysia, newly employed nurses registered with the Nursing Board undergo a 1-week orientation and are required to participate in a 6-month mentoring programme. The core concept of these programmes is to provide coaching and counselling to improve the nurses' long-term work skills and competencies. After 6 months, the nurses must undergo the National Nursing Audit (NNA), where they are assessed and observed by their mentors. Nurses who have passed the NNA are expected to work independently as professional nurses in hectic working environments that involve resource constraints, high workloads, and different working cultures. This high expectation can cause transition shock and affect the nurses' adaptation [22].

As research on adaptation during transition is insufficient, this study aimed to identify the extent to which the factors organisational contribution (OC), academic institution contribution (AIC), and personality traits (PT) are associated with new nurses' adaptation during transition. The results provide research-based evidence to nursing authorities on the success factors related to adaptation, contribute to the growing body of knowledge and literature on newly graduated nurses' adaptation and transition, and encourage collaboration between nursing academic institutes and workplace organisations to establish an improvement cycle to facilitate the prompt and efficient adaptation of newly employed nurses at Malaysian Ministry of Health (MOH) hospitals during the transition phase.

Research framework and research hypotheses

The research framework was constructed based on the RAM [23] and organisational socialisation theory [4]. Briefly, the RAM describes the interaction between stressors (or the external environment) and the open system in response to adaptation. In this context, the open system was the newly employed nurses and comprised four adaptive modes: interdependence, self-concept, role function (RF), and physiology.

The interdependence adaptive mode refers to the factors related to interpersonal interaction in providing and receiving value or support. The mode consists of teacher's characteristics (TC), clinical teacher roles (CTR), and superiors' roles (SR). The self-concept adaptive mode comprises hardiness (HR), self-esteem (SE), optimism (OP), caring (CG), and proactive (PRO) values, which refer to psychological, emotional, spiritual, and personal values, respectively. The RF adaptive mode focuses on the workplace organisational role in mediating new nurses' roles, positions, and work requirements and comprises the learning environment (LE), nursing programme clinical component (CCNP), work characteristics (WC), organisational support and teamwork integration (OS_TI), work readiness (WR), and RF. The physiology adaptive mode involves socio-emotional support (SES), as it relates to how new nurses interact with organisational culture. Under these adaptive modes, the identified constructs were categorised into three main constructs: OC, AIC, and PT [24].

In this study, adaptive behavioural outcomes were measured using the third stage (outcome) of the organisational socialisation theory. The adaptive behavioural outcomes comprised four outcomes (work satisfaction, performance, turnover, commitment) directly correlated to new nurses' adjustment [25]. Numerous studies have demonstrated that job satisfaction is positively associated with being more likely to remain in the nursing profession [26, 27]. Furthermore, work commitment and performance are also highly correlated [28, 29]. Therefore, we used job satisfaction, work performance, self-belief, and work commitment as proxies to measure the

adaptation level. Furthermore, PT were identified as a mediator in the relationships between OC and adaptation level and between AIC and adaptation level.

Based on Fig. 1, the following hypotheses (H) were proposed:

H1 OC significantly affects newly employed nurses' adaptation (NENA).

H2 PT significantly affect NENA.

H3 AIC significantly affects NENA.

H4 OC significantly affects PT.

H5 AIC significantly affects PT.

H6 PT mediate the relationship between OC and NENA.

H7 PT mediate the relationship between AIC and NENA.

Methodology

Sampling and data collection

The cross-sectional approach deemed more appropriate to test the hypotheses. The population involved new nurses working at MOH hospitals who had been employed in 2019 and who had between 1 and 2 years of service experience. In 2019, most new nurses were assigned to state hospitals. To retain sample homogeneity, only nurses working at state hospitals were invited to participate in the study. The information on 806 eligible state hospital nurses was obtained from the respective District Health Office liaison officers. As a 5:1 sample size: parameter number ratio was required [30, 31], the 123-item questionnaire required a total sample size of 615. The participants were chosen randomly from the sampling frame via simple probability sampling to avoid sample selection bias. The validated and reliable NENA questionnaire (NENA-q) (Additional 1) was distributed to the selected respondents. The data were collected from August 2021 to December 2021.

The survey was conducted during the Movement Control Order (MCO) that had been imposed due to the COVID-19 pandemic. The consent form and questionnaire were designed and distributed to the respondents via Google Forms. The participants were allowed to respond at a time convenient to them without feeling fearful or pressured. Of the 615 potential respondents, 119 declined to participate in the study. The data of the remaining 496 respondents were assessed using sequential equation modelling (SEM). SEM is the most appropriate statistical analysis to investigate cause–effect relationships among exogenous and endogenous constructs [32].

Before modelling the structural model for hypothesis testing, the latent constructs were validated through confirmatory factor analysis (CFA). The higher-order construct of the measurement model was validated with a 2-step CFA: individual CFA and pooled CFA [30, 32]. The CFA determined that all latent constructs (OC, AIC, PT, NENA) met the construct validity and passed the convergent and discriminant validity [25]. Once the model had

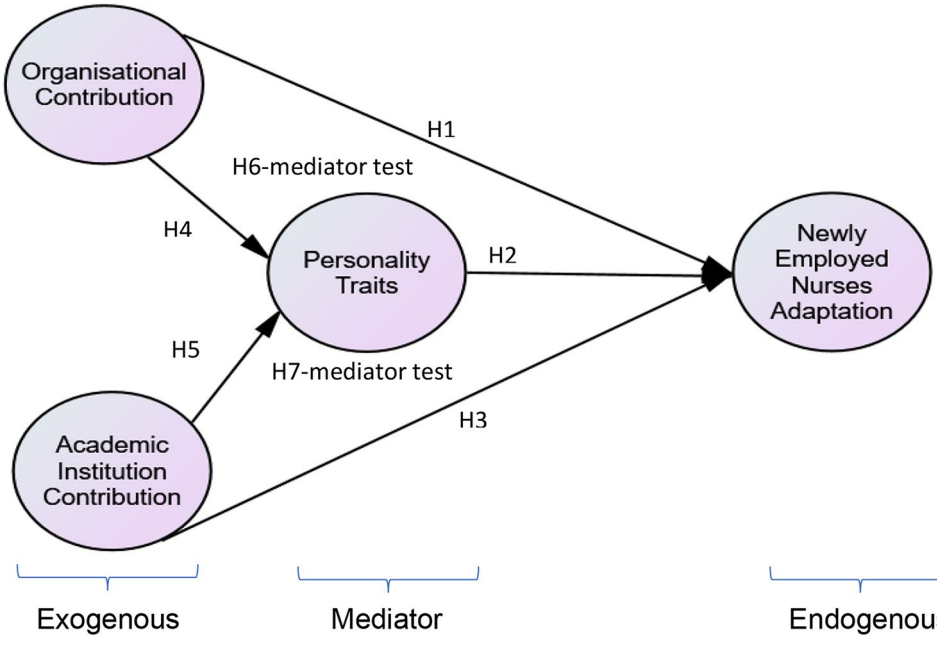

Fig. 1 The proposed hypotheses

been validated, the measurement model was converted into a structural model to test the hypotheses. The standardised regression paths (standardised estimates) and regression paths (unstandardised estimates) of the model to perform structural analysis were computed using IBM SPSS Amos 24.

Measurement instruments

NENA-q

This study used the NENA-q, which was specifically designed to assess the adaptation levels of newly employed nurses [24]. An exploratory factor analysis (EFA) revealed that the questionnaire formed a second-order construct comprising four dimensions: OC, AIC, PT, and NENA. The questionnaire was selected based on its relevance to measuring the multifaceted factors that influence new nurses' adaptation in the workplace.

The OC construct

The OC concept was developed based on several works [33–35] using a 5-point Likert scale (1: 'strongly disagree'; 5: 'strongly agree'). The important factors were SR, OS_TI, SES, WR, RF, and WC. SR refers to the leaders' responsibility to provide motivation and guidance to new nurses. Seniors' or supervisors' advice and information can enhance work performance and significantly increase the feeling of community belonging [36].

OS_TI refers to the workplace organisational role in the various influences on nursing performance. A key component of OS_TI is the observation of the impressions of adaptive behaviour among newly graduated nurses after they receive positive stimuli through training and collaborative methods. Organisations introduce newcomers to cultural and workplace socialisation through orientation and mentoring programmes. Both programmes contribute significantly to nurses' adaptation, work commitment, and job satisfaction [8, 37, 38].

Workers achieve job satisfaction and adapt to workplace pressures more easily through positive impressions [39]. SES includes social construction, social acceptance, and a sense of belonging. Social support is an important aspect of creating a sense of ease and security and increasing morale and belonging, which can facilitate NENA [7, 8, 40].

Newly graduated nurses acknowledge that their WR determines the success of their transition and workplace integration [41]. In this study, WR was defined as the new nurses' ability to determine or predict the skills needed to perform tasks effectively. New nurses who are less prepared to face the working environment reported feeling dissatisfaction, anxiety, and a lack of confidence [42]. Additionally, role clarity among new nurses has been associated with excellent work performance, high job satisfaction, and low turnover rates [43]. Newly graduated nurses must understand the required standards and protocols and their job scope, roles, and responsibilities to optimise their work performance and aid the maintenance of job satisfaction and long-term retention [21].

The AIC construct

The nursing education instrument is based on existing and validated questionnaires with some modifications. The sub-domains of the nursing education components LE, TC, CTR, and the clinical and classroom components of the education programme (CCNP) were adapted from [44–46]. The variables were evaluated on a 5-point Likert scale (1: 'strongly disagree'; 5: 'strongly agree'). Based on the faculty attributes with confidence, equilibrium, and success (FACES) theory, nursing schools should implement positive LEs, experienced teachers, and excellent teaching strategies to ensure that novice nurses quickly adapt during transition [47]. Previous studies identified a gap between an ideology-dominated nursing education and a good occupational skill-dominated nursing profession [18]. Thus, CTR were considered to bridge the gap between theoretical learning and clinical nursing practice. The LE component is related to new nurses' ability to connect their student practical/work experience with professional practice. This component is considered pre-entry knowledge as it is intended to provide sufficient experience in and opportunities for clinical practice. Classroom components refer to how adequately the educational programmes prepare students with the required basic knowledge before they implement it in clinical practice. Finally, the TC component includes nurse educator qualities and characteristics such as vast knowledge and experience, professionalism, caring, and strictness.

The PT construct

In this study, PT refers to the interpersonal strength required by new nurses to handle stressful events. Strength of character buffers the negative effects of work-related factors and the greater challenges experienced, which enhances job satisfaction [48] and reduces turnover rates [49]. This strength was measured by assessing the new nurses' HR, PRO, SE, OP, and CG values. This study focused on how the newly hired nurses' positive PT were related to adaptive behaviour. The nurses' PT were developed based on HR [50], PRO [51], SE [52], OP [53], and CG values [54]. Considering that new nurses experience physical and emotional fatigue, anxiety, low SE, and despair when trying to adapt to new health unit environments, we attempted to determine the relationship between the nurses' PT, which must be established to help them adjust at work. The personality variables were evaluated on a 5-point Likert scale (1: 'strongly disagree'; 5: 'strongly agree').

The NENA construct

Adaptive behavioural outcomes were defined based on the adaptation outcome component of organisational socialisation theory and measured using a validated instrument [25]. Initially, these outcomes were based on nurses' job satisfaction [55] and clinical competency [56]. Following EFA, the factors were divided into four categories and the component was renamed based on the meanings of the items in each factor (job satisfaction, work performance, self-belief, commitment) as the outcome indicators of an adaptive response. All variables were evaluated on a 5-point Likert scale (1: 'strongly disagree'; 5: 'strongly agree').

Patient and public involvement

None.

Results

Demographic information

The respondents' demographic variables included posting placement, gender, age, work experience, field of work, and duration of unemployment after graduation. Additionally, 'intention to leave the nursing profession' was examined as a background factor relevant to understanding the respondents' career perspectives (Table 1). The sample consisted of 496 newly employed nurses working at MOH state hospitals. Up to 90.9% of the participants were female, and 9.1% were male. The data were collected during the COVID-19 MCO, when COVID-19 cases were higher in Selangor and the southern states (Johor, Melaka, and Negeri Sembilan). Therefore, more nursing placements were in the Central (37.9%) and South Zones (23.8%), followed by the North (16.9%), West (15.3%), and East Zones (6.0%). Of the respondents, 77.4% had work experience before being assigned as registered nurses; the remaining 22.6% had no work experience. Most respondents had health sector work experience (55.6%), while 44.4% had worked in non-health sector roles. The unemployment duration referred to any duration after graduation during which the respondents did not work. This variable was categorised into a shorter duration (waited < 1 year and 6 months for registered nurse placement, 76%) and longer duration (waited for > 1 year and 6 months for placement, 24%). Additionally, 77.8% of the new nurses had no intention to leave the profession, while 22.2% did.

Table 1 Distribution of demographic variables

Group	Frequency (*N*)	Percentage (%)
Posting Placement by zone		
South Zone	118	23.8
Centre Zone	188	37.9
North Zone	84	16.9
East Zone	30	6.0
West Zone	76	15.3
Gender		
Female	451	90.9
Male	45	9.1
Age		
22–26 years old	280	56.5
27–30 years old	216	43.5
Work Experience		
Yes	384	77.4
No	112	22.6
Work Experience field		
Health Sector	276	55.6
Non-Health Sector	106	21.4
NA	114	23.0
Period of unemployment		
Shorter	377	76.0
Longer	119	24.0
Intention to leave		
Yes	110	22.2
No	386	77.8

NENA-q measurement model

The SEM was performed using a 2-stage modelling process, where CFA was tested before the structural model testing [57, 58]. Following the CFA, the items with the lowest factor loading (<0.5) and highest modification indices were removed from the construct. The average variance extracted (AVE) values for all measured constructs were >0.5, indicating acceptable convergent validity. The composite reliability (CR) of >0.6 indicated that the model achieved internal consistency. Once the individual CFA for each measurement model had been passed, pooled CFA was performed to determine the discriminant validity of the constructs and avoid violating the regression assumption. The results demonstrated that the correlation coefficient between two latent constructs did not exceed 0.85, indicating that the model contained no multicollinearity issues [59]. The NENA-q model fulfilled the discriminant validity criteria as the square roots of the AVE of the four latent constructs were greater than the inter-construct correlation [24]. After passing all requirements, the structural model was tested with an evaluation of the goodness of fit (GoF) of the NENA-q model. The cut-off root mean square error of approximation (RMSEA) values were 0.05–1.00; the confirmatory fit index (CFI) was ≥0.90; and the chi square/degree of freedom (Chisq/df) was ≤5.00 [30, 32]. The model fitness index results in the NENA-q measurement model were satisfactory (Chisq/df = 4.969, RMSEA = 0.090, CFI = 0.918) (Fig. 1). Furthermore, the data distribution met the normality distribution requirement, where the skewness was required to fall within the −1.5 to 1.5 range (S1). The hypotheses were tested after all reliability,

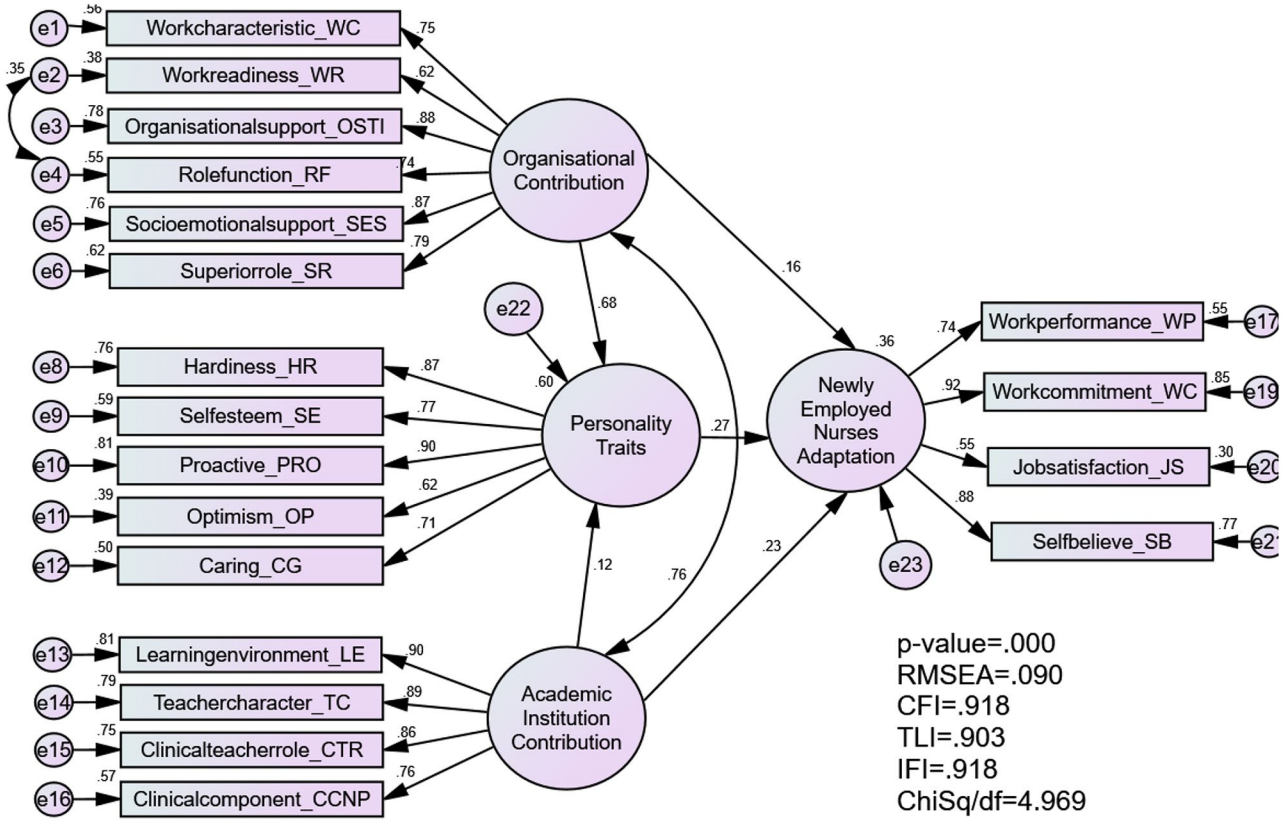

Fig. 2 Standardised regression path coefficient between constructs

Table 2 Unstandardised regression path coefficient between constructs

Hypothesis	Path	Estimate	S.E	C.*R*	*P*	Results	Remarks
H1	OC→NENA	0.140	0.076	1.838	0.066	Not significant	Not supported
H2	PT→NENA	0.216	0.060	3.632	0.000	Significant	Supported
H3	AIC→NENA	0.195	0.058	3.349	0.000	Significant	Supported
H4	OC→PT	0.715	0.069	10.297	0.000	Significant	Supported
H5	AIC→PT	0.121	0.060	2.032	0.042	Significant	Supported

Notes *N*=496; OC=Organisational Contribution; PT=Personality Traits; AIC=Academic Institutional Contribution; NENA=Newly Employed Nurses' Adaptation

internal consistency, and convergent validity indicators had been well established.

The SEM inferential analysis of the direct effects revealed that the squared multiple correlation (R^2) for the NENA was 0.36 (Fig. 2), indicating that OC, PT, and AIC contributed 36% to NENA. The model demonstrated that the correlation value of 0.76 between OC and AIC indicated a strong positive relationship, which suggested that OC and AIC should foster stronger ties and work more closely together for greater mutual benefits. That is, it is difficult for nurses to adjust to the new environment during transition if only one organisation supports them. Both constructs were discriminant, as the correlation value (Pearson correlation coefficient) was below the 0.85 threshold level [57].

This study proposed seven hypotheses related to the adaptive association factors among newly hired nurses at MOH hospitals. Three hypotheses described the effects of OC, PT, and AIC on NENA; two hypotheses described the effects of OC and AIC on PT; and two hypotheses described the effects of PT as the mediator between OC and NENA and between AIC and NENA.

The following direct effects were ascertained using a structural model: (H1) OC on NENA, (H2) PT on NENA, and (H3) AIC on NENA. Table 2 depicts the hypotheses testing results, which determined that H1 was not supported (β=0.140, $p>0.05$). For H2 and H3, the relationship between NENA and PT (β=0.216, $p<0.000$) and between NENA and AIC (β=0.195, $p<0.000$) were significant, and PT and AIC exerted strong and positive effects on NENA. Hence, H2 and H3 were supported. OC (β=0.715, $p<0.00$) was positively and strongly related to PT and significantly affected PT; therefore,

H4 was supported. Similarly, AIC (β=0.121, $p<0.042$) positively and significantly affected PT; therefore, H5 was supported.

Next, the mediator was tested with a simple mediation model based on a previously recommended method [57] that has been published in numerous journals [32]. We were particularly interested in the size and significance of indirect effects (OC/AIC → PT → NENA), as these inform the understanding of the association mechanism between individual values, the workplace, and the academic contributions involved in facilitating adaptation. Figure 3A depicts how the simple mediation model assessed the effects of OC on the PT relation (*a* path), then the influence of PT on the NENA (*b* path).

The results revealed a significant indirect effect of OC on PT (β=0.163, $p=0.008$) (S2), which supported H6. The indirect test of OC to NENA through PT indicated that the lower and upper bound confidence intervals were 0.078 and 0.288, respectively (S3). The absence of zero between the lower and upper bound confidence intervals demonstrated the significant indirect effects [57]. The direct effect of OC on NENA in the presence of the mediator was also significant (β=0.231, $p=0.00$). Although the SEM analysis did not support the relationship between OC and NENA as $p>0.05$ ($p=0.066$), indirect and direct effects were significant with the presence of the mediator. The mediation effect strength can be computed from the variance-accounted-for (VAF) value to ensure the mediation occurred. VAF is the magnitude of the indirect effect in relation to the total effect, where VAF>80% indicates full mediation, VAF of 20–80% indicates partial mediation, and VAF<20% indicates no mediation [60]. In the present study, the VAF value was 41%, indicating partial mediation in this relationship. Thus, PT partially mediated the relationship between OC and NENA, and therefore H6 was supported. Similarly, H7 was supported as AIC significantly and indirectly affected PT (β=0.181, $p=0.006$) (S4) (Fig. 3B). The lower and upper bound confidence intervals were 0.104 and 0.257, respectively (S5). As the confidence intervals did not exceed zero, the indirect effects were significant. Thus, the significant direct effects (β=0.258, $p=0.001$) indicated that PT partially mediated the relationship between AIC and NENA.

Discussion

This section discusses the results according to the research objectives and hypotheses. The main study objective was to investigate the significance of the relationships between OC, AIC, and PT and NENA during transition from a student nurse to a registered nurse. Additionally, PT were examined as a mediator in the relationships between OC and NENA and between AIC and NENA. The outcomes are discussed to explain the relationship between the workplace role, the academic organisation, and PT in facilitating NENA.

SEM is currently increasingly widely used. One advantage of SEM is that it allows the simultaneous modelling and testing of complex relationship patterns while concurrently yielding statistical efficiency values [61]. SEM can also extensively examine the relationships between latent variables and observe variables that contain measurement errors [62]. Additionally, the approach enables easy interpretation of latent variables, more accurate analysis of the proposed research framework, and better methodological evaluation [63].

H1: relationship between OC and NENA

The OC did not significantly influence NENA; therefore, H1 was not supported. However, OS_TI, WC, and SR had higher mean scores of 4.39, 4.36, and 4.23, respectively (S6). Therefore, these components were believed

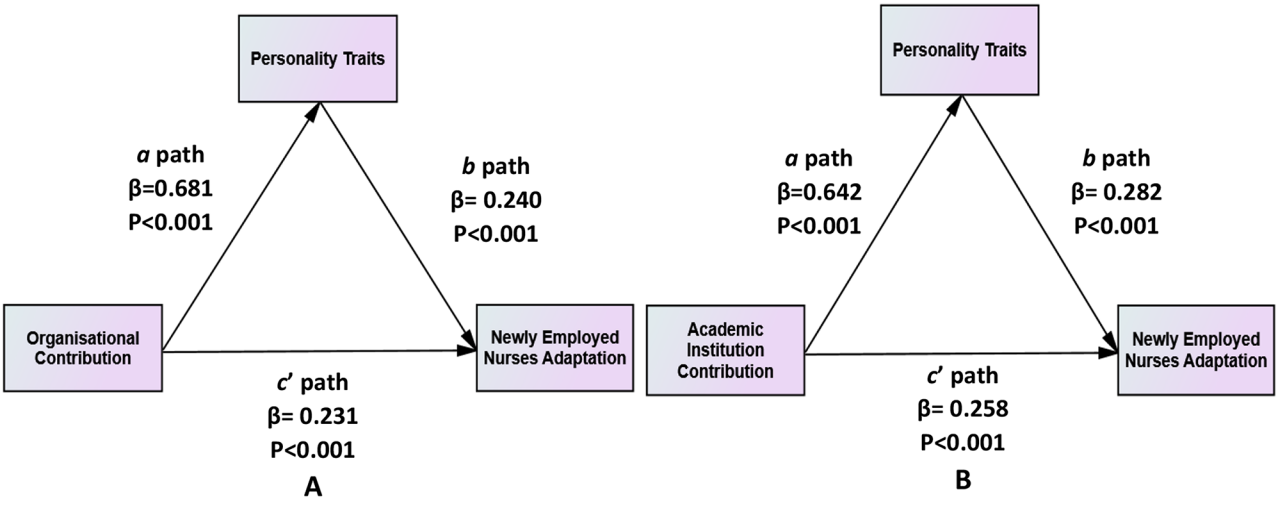

Fig. 3 Correlation coefficients for the relationships between OC (**A**) and AIC (**B**) (exogenous variables), PT (mediator) and NENA (endogenous variable)

to be more influential in relation to adaptation than the other OC components.

The OS_TI component comprises the organisational programmes, efforts, or strategies to support newly licenced nurses in becoming professional registered nurses. Orientation, mentoring, the NTP, and a preceptorship programme are among the familiar efforts available to newly hired nurses. This study supported the opinion of [34], who stated that mentoring and orientation interventions foster newly registered nurses' development and socialisation in an organisation or unit. New nurses undergo an orientation programme in their first 2 weeks at Malaysian public hospitals, followed by a mentoring programme. This arrangement is designed to orient new nurses to the new working environment, the hospital system, and the organisational standard operating procedures. Furthermore, orientation is highly related to new nurses' RF. During the orientation period, any necessary information is provided and explained to help new nurses gain a clear understanding of their duties, responsibilities, and work processes, ensuring that their RF is clear. The study outcomes were strengthened by [8], who reported that orientation programmes significantly positively influenced nurses' adaptation.

Subsequently, each newly registered nurse is assigned a mentor from among the experienced senior nurses, who are appointed as role models and guide the new nurses' career development. The core concepts of coaching and counselling in the mentoring programme are aimed at improving the nurses' long-term work skills and competencies and focus on developing and improving the nurses' personal potential to promote positive behavioural changes [64]. Mentorship programmes, particularly the elements of reflection and mentor–protege relationship quality, are positively related to the new employee's socialisation and adaptation [65]. Furthermore, newly employed nurses are encouraged to participate in continuous professional development programmes (CPD) to guarantee high-quality ethical care and nurse productivity.

Workload allocation and working hours were the WC element and the second most important promoters of adaptation and socialisation. Supervisors are advised to assign tasks judiciously and provide learning support during transition [66]. The distribution of tasks appropriate to the nurses' knowledge and experience levels is an important factor that can aid transition. Complex tasks can impair nurses' abilities to make critical and accurate decisions; increase stress, anxiety, and depression; and negatively affect nurses' self-esteem and confidence levels [67]. Furthermore, performing an incorrect procedure on a patient or making a false decision would adversely affect the patient's safety. Additionally, new nurses perceive that the main factor contributing to job stress is being assigned to deal with death and dying patients, as they feel that they are not psychologically prepared to manage such patients [67].

Typically, long working hours are believed to cause nurses to experience physical disorders and negatively affect new nurses' quality of life and psychology. However, our results contradicted this belief, where long working hours helped new nurses adapt quickly [8]. determined that long working hours affect new nurses' quality of life and performance level. Surprisingly, nurses believed that working long hours could aid them in gaining more clinical practice knowledge and experience [12]. Furthermore, we believe that long working hours can indirectly provide more space and time to acquaint new nurses with the culture, friends, and other medical personnel to assist in socialising and becoming insiders.

In this study, the SR component was related to the superior leadership value and the relationship with new nurses. According to [68], supervisors' or preceptors' constructive and positive feedback exerted a major influence on career development and motivated new nurses to improve their nursing practices. Their approach used a self-reflection tool with which superiors and new nurses could measure adaptation [15]. Moreover, new nurses were perceived as having adapted when they and their superiors had a positive relationship. One strategy new nurses can use to build positive relationships with their superiors is to frequently ask clinical questions [15].

H2: relationship between PT and NENA

H2 states that PT significantly influences NENA. The analysis revealed the significant positive influence of PT in facilitating NENA. New nurses possessing proactive, hardiness, self-esteem, caring, and optimism values would have an increased ability to adapt quickly to the working culture. A comprehensive study of new employees emphasised that proactive has two dimensions: proactive changes and proactive roles [69]. The former refers to a new employee's tendency to adjust or change their behaviour to achieve a desired outcome, while employees who adopt proactive roles facilitate effective adaptation. In nursing, proactive changes are also known as self-embodiment or self-awareness. Demonstrating the abilities to master nursing practices, present positive impressions to seniors, and collaborate with other staff aids new nurses in becoming self-aware of their surrounding environment and learning the work group culture, maximising the probability of their acceptance by the working community [70–72]. Additionally, empirical evidence has demonstrated that a proactive personality promotes adaptation as it aids new graduate nurses in developing resilience, increasing their self-confidence, and managing stressful situations. Furthermore, a proactive personality also reduces staff turnover [10, 18].

A proactive personality also aids new graduate nurses in developing the hardiness needed to overcome challenges and resistance [10]. Hardiness refers to the individual's potential to manage stressful and difficult life situations to achieve socio-psychological adjustment [73]. Researchers have asserted that the HR value should be assessed in new nurses, as it can be viewed as a personal resource that allows individuals to use contextual factors such as work support to reduce their psychological stress or improve their psychological well-being [74]. Furthermore, hardiness also reduces burnout among nurses [75].

In the present study, the caring attitude aspect related more to expressive behaviour, which involves emotional kindness towards patients. Cultivating a caring attitude requires a nurse's spiritual, moral, personal, and social involvement with a commitment to themselves and other communities [76]. As caring behaviour is significantly associated with job satisfaction [77], it directly and positively affects adaptation. Meanwhile, nurses with self-esteem are automatically optimistic. Many studies have proven that confidence is an important personality trait for new nurses as it aids them in developing the resilience needed to confront stressors while improving their competency and job satisfaction [14, 78]. However, new nurses may experience a crisis of confidence as they lack the confidence to assume responsibility if their patients experience unfortunate outcomes [79]. Therefore, transition programmes such as NTP, mentoring, orientation, preceptorships or induction programmes specifically designed for new nurses result in significantly higher SE and OP values [33, 36, 39].

H3: relationship between AIC and NENA

We determined the influence of AIC on NENA, where the analysis revealed that H3 was supported. Nurses attending public nursing colleges are exposed to a real working culture in the fifth semester, known as the practical period. Here, students are required to 'learn and do' to improve their nursing practice and build relationships with other healthcare personnel to enhance their confidence. The results were consistent with those of [80], who stated that students exposed to a real working environment and clinical or emergency simulations during their study period gained experience prior to pre-entry knowledge. Thus, nurses' confidence levels increased when performing their nursing practice [80]. Therefore, the clinical knowledge and experience nurses gain during the study period are important for socialisation and critical thinking skill development, and significantly influence the learning process and aid in bridging the knowledge–implementation gap [81, 82].

Our results were consistent with the FACES theory [46]. A positive LE, an experienced and knowledgeable teacher, interactive teaching strategies, and using various approaches to aid students may cultivate their motivation to enhance their learning process. New nurses would contact their nursing school teachers if they encountered workplace issues [82]. Academic institutions can occasionally provide support systems for new nurses to help them address difficult workplace situations. Additionally, nursing school are the gateway for new nurses to become professionals. Therefore, it was recommended that nursing schools and workplace organisations provide final-year nursing students with guidelines and preparation standards before they experience the transition stage in their first year of service [83]. Sharing adaptation knowledge at academic institutions will increase students' awareness and enhance their mental preparedness before they enter the workplace environment.

H4: relationship between OC and PT

The analysis revealed that H4 (regarding the relationship between OC and PT) was supported. The six OC components (WC, SR, OS_TI, SES, WR, RF) contributed about 72% to the new nurses' personality development. As mentioned previously, although organisational contributions do not significantly support new nurses' adaptation, they significantly influence personality traits. This suggests that organisational practices indirectly facilitate adaptation by shaping the new nurses' personality traits, which are critical for effective socialisation. These findings align with organisational socialisation theory, which posits that successful adaptation requires organisations to provide meaningful support, including consideration of the new nurses' characteristics and behaviors [4].

Any organisational workplace transition programmes established specifically for newly employed nurses enhanced their clinical skills and thus developed their self-confidence to deliver safe nursing practises [84–86]. Self-confidence is a valuable resource in helping nurses overcome issues and difficulties after several months in their professional role. New nurses are also required to have self-confidence to develop competence [87]. Furthermore, experienced, knowledgeable, respectful, and supportive facilitators or mentors are positively related to new graduates' confidence, especially in professional collaborations [88, 89]. Additionally, constant support from a mentor or facilitator can aid new nurses in developing proactive values. Such nurses are given opportunities to ask questions and demonstrate their talent and interest in performing assigned tasks [90].

Superiors are involved in fostering hardiness and resilience among new nurses to aid their adaptation to the working environment. Strategies are required to instil hardiness values through educational activities such as simulation, role play, discussion, and self-reflection [91]. Additionally, verbal persuasion or feedback and

reflection sessions are considered useful strategies for instilling hardiness, confidence, self-esteem, and optimism among new nurses [92, 93]. Nevertheless, their superiors should demonstrate a firm attitude and a more prudent approach to increase the nurses' credibility and resilience. An inappropriate approach could cause interpersonal conflict between superiors and new nurses. This conflict is also known as horizontal violence, where the highlighted assertiveness is more akin to verbal or physical bullying or threats, which harm the new nurses' self-esteem and self-image [70, 93, 94].

Establishing supportive and positive surroundings is another important aspect of developing caring attitudes. People often choose a caring attitude to increase their resilience as this relationship involves dynamic interaction between themselves and other people [95]. The natural tendency and desire to help others can maximise the probability of being accepted into a social group and receiving support when needed [18].

H5: relationship between AIC and PT

The four AIC components (CCNP, LE, TC, CTR) contributed to the new nurses' personality development. The results indicated that new nurses socialised and adapted more easily to the new working environment if they had been exposed to a workplace setting during their education. This was proven by [80], who stated that clinical simulation exposed nurses to good and bad experiences when handling patients. The clinical simulation also aided them in expanding their critical thinking skills and enhancing their personality values, specifically hardiness, self-confidence, and caring [80, 82]. However, another study reported that new nurses' self-confidence might be eroded when they undergo nursing education, especially during the clinical practicum. This development might stem from the fact that new nurses lack confidence in what they should say from the clinical perspective and how they should anticipate potential questions from clinical instructors or other team members [96]. Therefore, an important part of the CTR is to provide continuous support to nursing students during the practical period.

Furthermore [46], suggested that nursing schools should implement a positive LE, experienced teachers, and excellent teaching strategies to ensure that novice nurses adapt quickly during the transition. Interesting teaching approaches and strategies can sustain and promote nursing students' active engagement in learning activities and promote the students' proactiveness, self-esteem, and optimism [97, 98].

H6 and H7: PT mediates the relationship between OC and NENA and between AIC and NENA

This study determined the mediating influence of PT in the relationship between OC and NENA and between AIC and NENA. The statistical outcomes revealed that PT mediated the relationship between OC and NENA, highlighting that adaptation is influenced not only by external stimuli but also by intrinsic characteristics. These findings emphasized the importance of understanding individual differences in adaptive responses, as posited in Roy Adaptation Model [3].

As OC and AIC exerted significant direct and indirect effects on NENA, the mediation was partial. This result indicated that the effects of OC and AIC aided nurses' effective adaptation if they exhibited a positive personality. In fact, the adaptation process would be prolonged if only one type of initiative were used to aid nurses, but the nurses lacked motivation [99]. determined that the personal attributes of optimism, proactiveness, and negative affectivity contributed significantly to job satisfaction [99]. Positive work values, conscientiousness, and emotional stability significantly reduced the turnover rate among nurses in Taiwan [100]. Exhibiting valuable personality characteristics might aid new nurses in shaping their efficient adaptation to work [101].

Limitations

The generalisation of the results is limited as the study only involved new nurses who had graduated from public academic institutions (MOH training centres). Therefore, the aspects related to nursing academic institutions cannot be discussed further. As this study was conducted during the MCO period in Malaysia, most nurses had been assigned to general hospitals due to the lack of nursing staff there. Therefore, only nurses at general hospitals were selected as respondents during the data collection. Moreover, during this period, the nurses' responses to the questionnaires might have been influenced by the unique circumstances and challenges faced, potentially not reflecting typical workplace conditions. This study should be expanded to assess new nurses who have graduated from public and private nursing colleges and new nurses working at other MOH facilities, such as district hospitals, specialised hospitals, military hospitals, and health clinics. Our results should be corroborated by studies that use a longitudinal design.

Conclusions

We examined the relationships among the AIC, OC, PT, and NENA constructs and proposed that PT mediated the relationship between AIC and OC with NENA. Additionally, the NENA was assessed using job satisfaction, work performance, work commitment, and self-belief. The developed NENA-q model was established to highlight the effective factors and opportunities that encourage new nurses to adapt rapidly during transition. The adaptation success factors in the AIC construct were TC, LE, CCNP, and CTR. The potential determinants of

OC in facilitating adaptation were SES, WR, WC, SR, RF, and OS_TI. Furthermore, newly employed nurses needed the PT, which comprised HR, PRO, OP, CG, and SE, to achieve successful adaptation.

Overall, personal values partially influenced the role of workplaces and academic organisations in facilitating new nurses' effective adaptation. Therefore, developing personality values is vital for new nurses to achieve a successful transition and facilitates the adjustment process. Our results could be useful to nursing authorities to bridge the workplace–educational institution gap. Furthermore, continuous programmes or training are recommended to develop, emphasise, and enhance a nurse's personality. This would ensure that every nurse has the personality needed to adapt to their new working environment. We also encourage collaboration between academic institutions and working organisations to establish improvement cycles that facilitate the prompt and efficient adaptation of newly employed nurses at MOH hospitals during their transition.

Strengths and limitations of this study

I. Newly graduated nurses' transition to professionals must be considered an adaptation that allows individuals to successfully pass the transition period.
II. Transition must be supported and emphasised at the academic institution level, empowered and strengthened at the organisational workplace, and enhanced by a positive personality to help new nurses self-adjust effectively.
III. The Newly Employed Nurses' Adaptation questionnaire (NENA-q) model was developed to identify important areas for Malaysian nursing59 authorities to consider in empowering existing programmes and assessments specifically to facilitate effective adaptation among new nurses.
IV. The causal relationships among the variables could not be explained in detail; doing so would require a qualitative study.
V. The generalisation of the results was limited and would require the involvement of new graduate nurses from private nursing institutions.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12912-024-02543-2.

Supplementary Material 1

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Author contributions
Conception and design of study: HB, AI, RI, ZM, NHH, AHMY; Acquisition of data: HB, RI, ZM, NHH; Analysis and/or interpretation of data: HB, AI, ZA; Drafting the manuscript: HB; Revising the manuscript critically for important intellectual content: AI, ZA, LM, AHMY; Approval of the version of the manuscript to be published: All authors.

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Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethical approval
All respondents provided informed consent for inclusion before they participated in the study. This study was approved by the MOH Medical Research & Ethics Committee Institutional Review Board [KKM/NIHSEC/P20-1492 (11)]. The protocols used in the study were approved by the Hospital Canselor Tuanku Muhriz UKM (HUKM) Faculty of Medicine Secretariat of Research & Innovation (UKMOO/111/8/JEP-2020-454).

Consent for publication
Informed consent was obtained from all respondents.

Competing interests
The authors declare no competing interests.

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