Linking work engagement of emergency physicians to patient centricity in underdeveloped regions

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Orientation: Health facilities in underdeveloped regions present their challenges in terms of research, especially regarding the work engagement (WE) of health workers, in this case, emergency physicians. Adjustments to existing research models are needed to obtain accurate responses. Patient centricity (PC) as a new term in healthcare is the estimated variable in this study.

Research purpose: This study aimed to examine the relationship between the antecedents of WE and PC in emergency physicians who worked at hospitals in underdeveloped regions in Indonesia, incorporating WE as a mediator.

Motivation for the study: Studies linking WE to PC have never been established. Furthermore, studies regarding WE have never been carried out in underdeveloped regions, and most of them are only limited to job resources as a benchmark.

Research design/approach, and method: A quantitative survey was conducted through a purposive sampling technique to collect data from emergency physicians in hospitals in East Nusa Tenggara. There are 183 eligible respondents, whose responses were analysed through partial least squares structural equation modelling (PLS-SEM).

Main findings: The direct link to WE was found to be predominated by physician autonomy and public service motivation. It was found that WE positively and significantly connected to PC. The PLS-predict resulted in large cross-validated redundancy for this model.

Practical/managerial implications: This study has implications for policymakers and hospital management in developing personal and job resources in optimising PC through WE.

Contribution/value-add: This study will show a new approach where WE can estimate PC, and this model can be replicated and tested in a larger population of physicians.

Keywords: work engagement; patient centricity; emergency physician; social exchange theory; PLS-SEM.

Introduction

Having underdeveloped regions is a challenge for a country, especially in the effort to distribute health services. Insufficient resources, inappropriate allocations and suboptimal service quality are major obstacles to health services in underdeveloped regions. Based on the World Bank data (2022), lower-middle-income and lower-income countries account for most of the global burden of disease, but global spending on health is only 9.845%. In many developing countries, a lack of resources contributes to people's difficulties in accessing health services. These resources can be in the form of infrastructure, funds and health workers.

Southeast Asia is described as an area with a geographical position that becomes a major crossroads of trade, causing different health statuses in each country. Unfortunately, Indonesia as the largest country in Southeast Asia allocates a budget for the health of 2.905% of gross domestic product (GDP) in 2019 (The World Bank, 2022), making it the second-lowest country. Indonesia has a poor public health service system with only six doctors per 10 000 population (World Health Organization [WHO], 2020), which is still far from the WHO limit (1:1000). This can be an obstacle to the realisation of the Sustainable Development Goals (SDGs). The lack of equitable distribution of the national health workforce contributes to this consequence. Indonesia has 62 districts that are classified as underdeveloped regions based on Presidential Regulation of the Republic of Indonesia Number 63 of 2020 concerning the Determination of Underdeveloped Regions for 2020–2024 (Kementerian Sekretariat Negara Republik Indonesia, 2020). East Nusa Tenggara is the province with the most underdeveloped districts in Indonesia. However, there are still very few

health workers living in this area. The focus of the authors in this regard is the high disengagement of physicians in underdeveloped regions, which often causes vacancies. Moreover, there has been limited research that has explored the cause of physician disengagement, which can aggravate the inaccessibility of the community to health services (Rabkin et al., 2019).

Work-related well-being has been widely studied as work engagement (WE) (Shanafelt et al., 2016). Work engagement is characterised by a positive motivational state of well-being that involves high levels of energy, enthusiasm and dedication to one's work. Professionals who are passionate, dedicated and engaged in work will be proactive in achieving work goals and striving for excellence (Salanova & Schaufeli, 2008).

The morale of the organisational workforce will determine its efficiency. Behavioural and social science research shows that WE and job performance are correlated. Work engagement and morale among medical practitioners is a worldwide concern today. Poor WE leads to increased physician turnover, which negatively affects medical care job satisfaction (Scheepers et al., 2017). Consequently, by creating an environment that encourages job satisfaction, healthcare managers can develop motivated, productive and engaged physicians. This in turn will contribute to better quality patient care and patient satisfaction.

Efforts to improve the quality of health services cannot be separated from efforts to improve the quality and performance of all human resources (HR) and professionals in hospitals, and an important HR asset is the WE of emergency physicians, because they are the gate for patients seeking treatment at the hospital; besides that, they have direct and earliest contact with patients, thus creating a first impression of the quality of hospital services (Cooper et al., 2019).

Based on the personal interviews with seven emergency physicians at a private hospital in East Nusa Tenggara, several factors can be related to welfare such as health facilities, relationships with colleagues, income and promotion opportunities. Moreover, practice in more than one hospital with variety regarding the number of patients and the duration of work reduces the physician's punctuality to be present in service. They also admit that this affects their role in service, which can also be affected by their WE.

It is possible that from the results of the preliminary study, a temporary conclusion can be drawn that the WE of the emergency physicians has not been fulfilled, resulting in patient dissatisfaction with the services provided. Considering that WE tends to have a strong influence on the performance of physicians as professionals in hospitals, it can be seen in productivity, late attendance and physician turnover rates (Atingabili et al., 2021).

Research has been conducted in several countries with models designed in previous studies (Hadi & Hanif, 2022; Rameshkumar, 2020; Van & Nafukho, 2020). However, most

of these studies were conducted in nonmedical populations (Davidescu et al., 2020; Gawke et al., 2017; Imran et al., 2020; Vuong et al., 2021). Most of the WE studies conducted on health workers were still carried out in secondary and tertiary referral hospitals (Mehta, 2020; Petrovsky & Ritz, 2014), so specifications related to the explanatory ability of this model were needed for the population of health workers in underdeveloped regions. Moreover, most of them are only limited to job resources as a benchmark, and they rarely measure the personal resources of their employees, in this case, physicians (Mehta, 2020). Besides the effort to assess the WE of emergency physicians, studies are needed to link this with their patient centricity (PC) – enabling patients to secure medical assistance according to the choice, time and place of need (Ricca & Antonio, 2021) – to improve patient safety and patient engagement.

To explore the research gap, this study aims to examine the factors related to emergency physician WE and how WE relates to PC. The results of the analysis of this research model are expected to make a new contribution to confirming the WE theory in the context of emergency services in underdeveloped regions. It is also hoped that managerial benefits can be found to increase the WE of the emergency physician to improve the quality of hospital services.

Literature review
Social exchange theory

The initial focus that gave rise to modelling in this study was the social exchange theory developed by Homans in 1961. Social exchange theory is a theory in social science that states that in social relationships, there are elements of reward, sacrifice and profit that interact. This theory explains how humans perceive relationships with each other based on their perceptions of (1) the balance between what is given in the relationship and what is excluded from the relationship; (2) the type of relationship that is carried out; (3) how humans relate to the society (between communities), where small groups are households and have better relationships with others (Meira & Hancer, 2021). Social exchange theory includes the basic theory of rationality, more integrative exchange theory, network exchange theory and rational choice theory. Although there are various modes of exchange, Homans focused his studies on dyadic exchange (Cropanzano & Mitchell, 2005). This theory underlies the model of antecedents and consequences of employee engagement that is applied in this study.

Antecedents of work engagement

Work engagement is determined by a variety of factors, including job characteristics, perceived organisational support (POS), perceived supervisor support (PSS), perceptions of distributive justice and perceptions of procedural justice, all of which predict a variety of outcomes, such as job satisfaction, organisational commitment and organisational citizenship behaviour directed at either the individual or the organisation (Saks, 2006). Employees

determine their level of involvement in their work and organisation based on the resources available to them. The antecedent is a resource in the model, and when employees receive it, they will respond with a higher level of engagement (Saks, 2019). Employees believe they are compelled to put more effort into their work because of the rewards they receive from their employer. The amount of cognitive, affective and physical resources an individual is willing to dedicate to the performance of their function is determined by the organisation's economic or socio-emotional resources (Žnidaršic & Bernik, 2021).

The Utrecht Work Engagement Scale (UWES) has been utilised in the majority of WE studies. According to a recent evaluation of engagement research, UWES was used in 86% of investigations (Bailey et al., 2017). This makes it impossible to compare Saks' (2019) findings to those of other engagement research, and it raises doubts about the model's validity and generalisability.

Based on the review and comparison conducted by Saks through the revision of the method in 2019, the overall results of measuring WE using UWES are the same as the results of his prior study, which can provide some support for generalising its findings to UWES WE measures. However, UWES is related to all consequences, and UWES mediates the relationship between antecedents and consequences as well as WE (Saks, 2019).

Engaged workers have superior performance and financial outcomes as a result of their great dedication and focus on their work activities. Furthermore, engaged workers have more creativity and are more inclined to innovate and be entrepreneurial because of their openness to new ideas (Gawke et al., 2017). In addition to these results at the individual level, research has indicated that workers with high WE are more likely to assist their coworkers. Work engagement is favourably associated with team performance at the team level (Saks, 2019). Because engagement spreads from one person to the next, it has a significant impact on the team.

Little is known about the WE of emergency physicians, although their key role can determine the quality of services provided. Lack of job support, long working hours and challenges in managing life-threatening cases are associated with increased stress and lower job satisfaction (Shams & El-Masry, 2013). The authors applied the revised Saks' (2019) antecedent model to examine the factors that could have relations with the WE of emergency physicians.

Physician autonomy (PA) implies that physicians should have full freedom to treat patients according to their best judgement (Zhang et al., 2021). Physicians lose their professional autonomy under managed care. Professional (clinical) autonomy is compromised under managed care, such as frequently having to seek consent before starting treatment, prescribing only authorised drugs and following a specific treatment plan for a particular disease. Things like the above will greatly affect the WE of the physician concerned about carrying out his or her obligations in the hospital.

Public service motivation (PSM) is defined as an individual orientation, in this case, that of emergency physicians who work in both district and private hospitals, towards providing services to people with the intention of doing good for the larger community (Palma & Sepe, 2017). Public service motivation has been associated with major positive consequences, such as organisational citizenship behaviour as described by Koumenta (2015), organisational commitment as studied by Naff and Crum (1999) and job satisfaction as described by Steijn (2008). A meta-analysis by Cerasoli et al. (2014) showed that performance improvements and increased probability of performance were more visible with the help of intrinsic motivational sources than extrinsic motivators. According to Petrovsky and Ritz (2014), there is a significant positive relationship between PSM and organisational performance.

Work–life balance (WB) as a form of work flexibility provides a balance between the professional and personal life of the workforce, which leads to high performance and the overall improvement of the organisation (Davidescu et al., 2020). Job adjustment theory states that job flexibility leads to higher engagement and increased job performance. If Bal and De Lange (2014) proved that the relationship between work flexibility and work performance was mediated by labour commitment, it also showed that time flexibility significantly affects labour productivity.

A good and healthy relationship with colleagues (RC) can lead to social support provided by the organisation and is described as interpersonal exchanges in which one individual helps another individual in the organisation, as seen in the interspeciality relationship that is well established within the pillars of the medical profession. Social support is comfort, attention, appreciation or other forms of assistance that individuals receive from other people or groups. Peer support is positive feelings, trust and attention from others in the individual's work life, recognition, one's trust and direct assistance in a certain form (Vassos et al., 2019).

Perceived organisational support for employees is an effort to realise welfare and various awards that can be given for contributions and evaluations of employee performance (Atingabili et al., 2021). Based on this understanding, employees who receive POS will positively perceive the support, and vice versa, POS will give a negative evaluation of employees that both determines WE and employee performance, including physicians (Imran et al., 2020). Therefore, the physician's perception of the support provided by the company becomes interesting to study more deeply because it can determine how the physician behaves at work.

Several efforts to motivate and improve employee performance are through rewards and recognition (RR). If the remuneration is arranged correctly and fairly, accompanied by good rewards, the employees will feel

satisfied and motivated to achieve the goals and objectives of the organisation. The level of remuneration of workers will determine the scale of life and, in turn, will show the dignity and social status in society. Therefore, if employees think that the salary they receive is inadequate, performance satisfaction decreases, they are not motivated and this ultimately affects work performance, so organisational goals are not achieved (Rehman et al., 2010).

Jain and Khurana (2017) argue that employees possessing the required knowledge and skills are essential for any organisation seeking growth and success in business. In today's dynamic business scenario, the opportunity to learn and develop (OLD) has gained importance in keeping employees engaged and maintaining a competitive advantage. Proper learning and development plans to nurture talent can increase engagement rates. Khan et al. (2016) interpret training and development and job satisfaction as important parameters of employee performance. They tried to study the effect of training and development on employee performance through job satisfaction. A sample of 105 employees of a telecommunication company in Pakistan was collected and analysed. The results showed that there was a positive impact of training and development on employee performance. Thus, they concluded that by investing in training and development programs, WE among employees would potentially increase.

Physicians who spend more time completing paperwork (PW) and have a bigger administrative workload have poorer job satisfaction (Ly & Glied, 2014). There is also evidence that using an electronic health record is linked to reduced professional satisfaction and increased burnout (Shanafelt et al., 2016). Administrative work, on the other hand, can be beneficial, as there is evidence that telephone and electronic communication with patients can reduce office visits and enhance patient outcomes (Apaydin, 2020).

Physical, psychological, social and organisational components of a workplace that are good or functional in attaining work goals, minimising working demands and accompanying physiological and psychological costs and encouraging human growth, learning and development have been classified as hospital resources (Bakker & Demerouti, 2007). Only physical resources (hospital facility [HF]) were investigated in this research. A literature review indicates that job resources have been found to mediate the relationship between behaviour and organisational workforce performance (Shin & Hur, 2019).

Extending the aforesaid reasoning, the authors propose the following hypotheses:

H1: Physician autonomy is positively connected with WE.

H2: Public service motivation is positively connected with WE.

H3: Work–life balance is positively connected with WE.

H4: Relationship with colleagues is positively connected with WE.

H5: Perceived organisational support is positively connected with WE.

H6: Rewards and recognition are positively connected with WE.

H7: Opportunity to learn and develop is positively connected with WE.

H8: Paperwork is negatively connected with WE.

H9: Hospital facility is positively connected with WE.

Linking work engagement and patient centricity

There has been no research linking WE and PC. Despite minimal evidence in healthcare, previous research has linked WE to higher performance in a variety of industries. Engaged health workers are more likely to be genuinely driven, achieve their goals and learn from their mistakes, which has been linked to organisational-level quality outcomes. Physician engagement is considered to be higher in the healthcare industry than in other industries, and hospitals with more physician involvement deliver better patient care and have a better safety record than those with low WE (Wake & Green, 2019).

Although there is still limited research on this subject, the historical relationship between job satisfaction, WE and service quality was reported in a study by West et al. (2011), where patient satisfaction, hospital mortality rate, infection rate, absenteeism, staff turnover and annual health check-up ratings were significantly impacted. Based on the explanation above, the authors established the following hypothesis:

H10: Work engagement is positively linked to PC.

Research framework

From the signified literature reviews mentioned above, the authors have proposed the research framework as illustrated in Figure 1. In this model, there are 11 variables with 10 paths marked with arrows to describe the research hypothesis.

Methods
Sampling and data collection

A quantitative survey with a cross-sectional approach for collecting the primary data was applied to answer the research questions. The conceptual framework was empirically tested with a purposive sampling technique on the population obtained from nonmanagerial emergency physicians who have worked for at least a year in the district and private hospitals in East Nusa Tenggara in March 2022. The authors explained the main objective of the research to the physicians to obtain permission for the data collection.

The survey continued for 4 weeks, and a total of 190 responses were gathered. A few respondents did not meet the inclusion criteria, because of their position that also doubled as managerial staff in the hospital. After elimination, 183 eligible samples were collected. This amount met the criteria of the minimum sample requirement based on guidance for
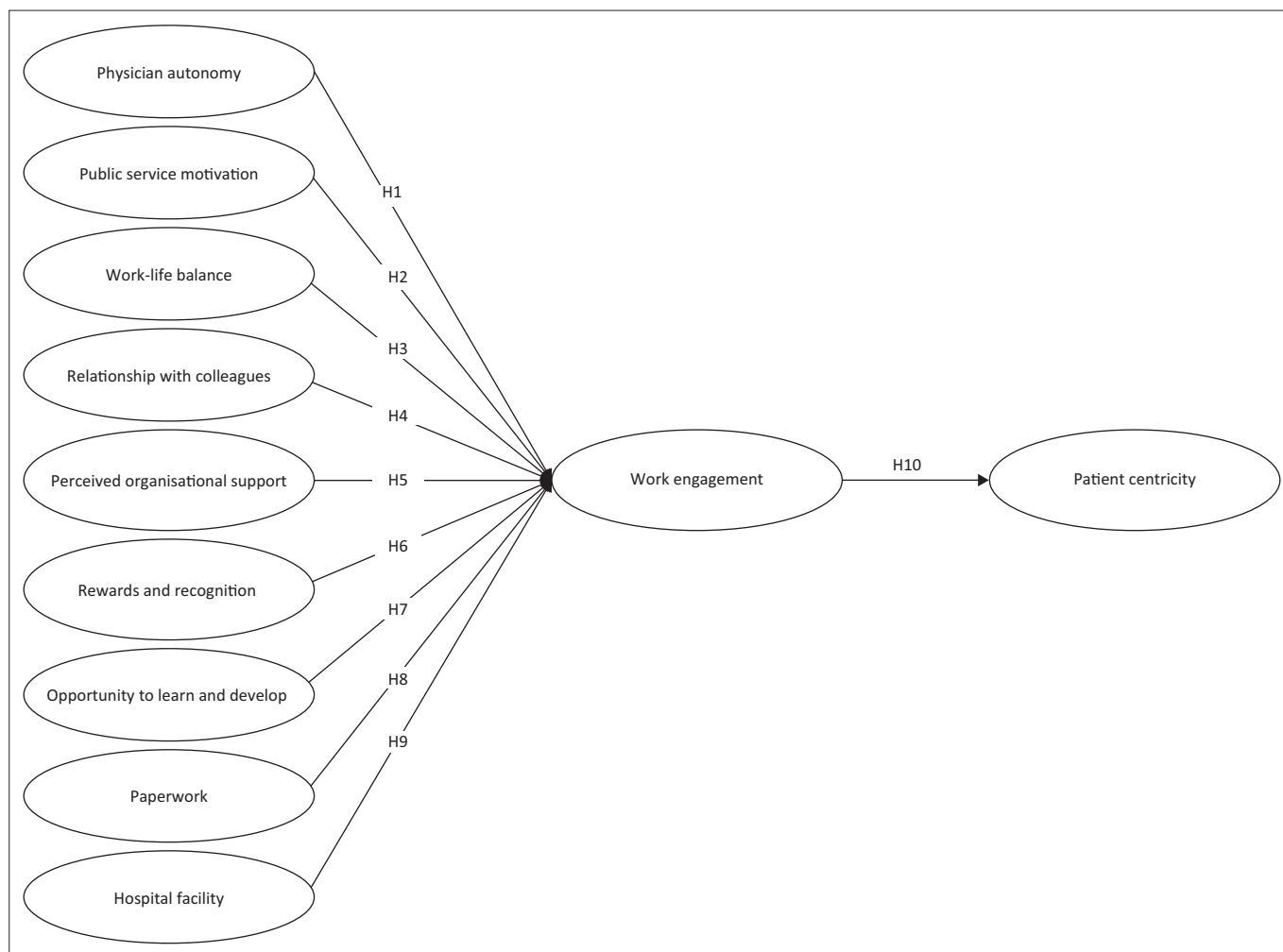
FIGURE 1: Conceptual framework.

analysis with partial least squares structural equation modelling (PLS-SEM) (Kock & Hadaya, 2018). The respondents participated anonymously and voluntarily, in which they were convinced of the confidentiality of their responses.

Measuring instruments

A set of indicators in a structured questionnaire instrument are used to measure the constructs in the proposed conceptual framework. The questionnaire utilised in this study was developed from a previous study and then tweaked to fit the needs of the investigation. Translators have already translated this questionnaire into the local language to guarantee that all questions are easily understood. Before being sent, this questionnaire was examined by specialists in the field of service marketing. On a scale of 1–5, respondents were asked to rate their level of agreement with the assertions on a scale of 1 (strongly disagree) to 5 (strongly agree), as specified in the questionnaire. The questionnaire for PA was adopted from Fida and Najam (2019); PSM from Zubair et al. (2021); WB from Irawanto et al. (2021); RC, PW and HF from Mehta (2020); POS from Atingabili et al. (2021); RR from Baqir et al. (2020); OLD from Vuong et al. (2021); WE from Lovakov et al. (2017); and PC from Srivastava and Singh (2020).

Data analysis techniques

The conceptual framework consists of 11 constructs and is considered a complex research model; therefore, the PLS-SEM method was preferable as it could analyse complex models in exploratory research. Partial least squares structural equation modelling approaches are preferred when the orientation of the study is more on the explanatory abilities of the model (Hair et al., 2019). The PLS-SEM analysis was applied through SmartPLS version 3.3.8 (SmartPLS GmbH, Oststeinbek, Germany), which was selected as it provides a bootstrapping menu to test significance (Memon et al., 2021). The main procedure with PLS-SEM is based on two types of models, namely measurement and structural models. The measurement model is established to measure reliability and validity between indicators and their respective constructs in the model. The reliability testing phase includes indicator reliability (outer loading) and construct reliability (Cronbach's alpha and composite reliability). The validity testing phase includes construct validity (average variance extracted [AVE]) and discriminant validity (heterotrait–monotrait [HT–MT] ratio). If these four things have met the requirements of reliability and validity, it can proceed to the next stage. The structural model is deployed to test the significant relationship between each construct in the research model. Further, a mediation analysis

will be conducted to evaluate the variables that act as a mediator in this model. A more advanced PLS technique, in this study, importance–performance map analysis (IPMA), is utilised for more specific managerial implications (Ringle & Sarstedt, 2016).

Ethical consideration

The Ethics Committee of the Universitas Pelita Harapan, with regard of the protection of human rights and welfare in research, has carefully reviewed the research protocol including the information given to the potential subjects entitled: 'Linking Work Engagement to Patient Centricity of Emergency Physicians in Underdeveloped Regions'.

The Department of Hospital Administration, Universitas Pelita Harapan, approves the above-mentioned protocol including the information given to the potential subjects (ref. no. 002/MARS-FEB-UPH/I/2022).

Result

Demographic results

The demographic data of the 183 eligible respondents are represented in Table 1. The majority of the respondents were male (52.5%), while women represented 47.5%. Based on age group, most of the participants were from the age group 20 to 29 years (64.5%). Also, most of the participants had 1–5 years of job experience. In terms of working duration, most of the respondents had 40 h – 80 h per week.

Measurement model

The outer loading from the reflective model was done to assess the indicator of reliability. The results of the analysis show that all 59 research indicators meet the outer loading criteria, with a loading value above 0.708. From the internal consistency test, all constructs showed Cronbach's alpha greater than 0.7 and composite reliability as an upper threshold ranging between 0.7 and 0.95 (Hair et al., 2019), indicating the constructs' reliability of the respective model. Assessment of the convergent validity was done by measuring the AVE. This validity check shows that each construct has an AVE ≥ 0.50 as required (Hair et al., 2019), showing all constructs can explain at least 50% of item variance in the model, thus establishing convergent validity. The results of the reliability and validity tests can be seen in Table 2. A list of questionnaire statements concerning the indicators can be seen in Appendix Table A1.

The final step of the measurement model analysis is to check the discriminant validity by HT–MT ratio. This approach was used as it is known to have a more precise value (Hair et al., 2019; Henseler et al., 2014). The recommended threshold value for HT–MT ratio is below 0.9, referring to Hair et al. (2019) to establish that each construct indicator is conceptually different. Table 2 shows that all HT–MT values are well below the 0.9 thresholds; thus, it is concluded that

TABLE 1: Respondent profile.

Description	Category	Amount (*n*)	Percentage (%)
Gender	Male	96	52.5
	Female	87	47.5
Total		**183**	**100**
Age (years)	20–29	118	64.5
	30–39	58	31.7
	40–49	7	3.8
Total		**183**	**100**
District	Kota Kupang	28	15.3
	North Central Timor	19	10.4
	South Central Timor	17	9.3
	Kupang	14	7.7
	Belu	10	5.5
	Ende	9	4.9
	Manggarai	9	4.9
	East Flores	7	3.8
	West Manggarai	7	3.8
	Ngada	7	3.8
	West Sumba	7	3.8
	Central Sumba	7	3.8
	Alor	5	2.7
	Malaka	5	2.7
	East Manggarai	5	2.7
	Nagekeo	5	2.7
	Rote Ndao	5	2.7
	East Sumba	5	2.7
	Sikka	4	2.2
	Lembata	3	1.6
	Southwest Sumba	3	1.6
	Sabu Raijua	2	1.1
Total		**183**	**100**
Workplace	District hospital	98	53.6
	Private hospital	85	46.4
Total		**183**	**100**
Hospital type	A	0	0.0
	B	15	8.2
	C	108	59.0
	D	60	32.8
Total		**183**	**100**
Employment Status	Honorary employee	75	41.0
	Permanent	108	59.0
Total		**183**	**100**
Length of work (in years)	1–5	120	65.6
	6–10	56	30.6
	> 10	7	3.8
Total		**183**	**100**
Average working duration per week (in hours)	< 40	42	23.0
	40–80	139	76.0
	> 80	2	1.0
Total		**183**	**100**

all indicators used in this research model have adequate discrimination to measure their respective constructs. This measurement model analysis had passed the four parameters of the reliability and validity test sequentially. Therefore, it can be concluded that all indicators in this research model are reliable and valid to measure their respective constructs specifically. The model fit indices in this study were assessed by standardised root mean square (SRMR), and the value obtained was 0.06, lower than 0.08, which was the required value, indicating a good model fit (Sarstedt et al., 2022).

TABLE 2: Reliability and validity analysis.

Variables	Indicators	Outer loading	CA	CR	AVE	Discriminant validity (HT–MT ratio)										
						PA	PSM	WB	RC	POS	RR	OLD	PW	HF	WE	PC
PA	PA1	0.926	0.930	0.949	0.857	-	-	-	-	-	-	-	-	-	-	-
	PA2	0.938	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PA3	0.914	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PA4	0.924	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PA5	0.927	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PSM	PSM1	0.886	0.935	0.944	0.799	0.855	-	-	-	-	-	-	-	-	-	-
	PSM2	0.886	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PSM3	0.884	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PSM4	0.898	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PSM5	0.915	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WB	WB1	0.892	0.929	0.946	0.779	0.770	0.830	-	-	-	-	-	-	-	-	-
	WB2	0.871	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WB3	0.881	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WB4	0.888	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WB5	0.881	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RC	RC1	0.836	0.934	0.947	0.814	0.781	0.863	0.750	-	-	-	-	-	-	-	-
	RC2	0.919	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	RC3	0.916	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	RC4	0.919	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	RC5	0.939	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	RC6	0.878	-	-	-	-	-	-	-	-	-	-	-	-	-	-
POS	POS1	0.849	0.938	0.947	0.803	0.813	0.820	0.835	0.804	-	-	-	-	-	-	-
	POS2	0.909	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POS3	0.918	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POS4	0.921	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	POS5	0.881	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RR	RR1	0.916	0.932	0.948	0.843	0.756	0.756	0.733	0.794	0.749	-	-	-	-	-	-
	RR2	0.868	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	RR3	0.950	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	RR4	0.939	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	RR5	0.896	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	RR6	0.939	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OLD	OLD1	0.908	0.934	0.945	0.834	0.818	0.818	0.795	0.787	0.855	0.763	-	-	-	-	-
	OLD2	0.932	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	OLD3	0.922	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	OLD4	0.889	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PW	PW1	0.938	0.916	0.937	0.856	0.738	0.898	0.777	0.838	0.783	0.766	0.851				
	PW2	0.898	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PW3	0.940	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HF	HF1	0.910	0.941	0.949	0.836	0.851	0.849	0.835	0.832	0.833	0.785	0.831	0.842			
	HF2	0.901	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HF3	0.922	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HF4	0.911	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	HF5	0.927	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WE	WE1	0.927	0.942	0.950	0.866	0.662	0.509	0.636	0.458	0.669	0.522	0.666	0.566	0.588		
	WE2	0.922	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WE3	0.933	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WE4	0.956	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WE5	0.927	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WE6	0.920	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WE7	0.926	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WE8	0.940	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	WE9	0.922	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PC	PC1	0.921	0.943	0.949	0.846	0.731	0.532	0.605	0.462	0.670	0.514	0.666	0.554	0.595	0.868	-
	PC2	0.884	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PC3	0.946	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PC4	0.924	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PC5	0.956	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PC6	0.885	-	-	-	-	-	-	-	-	-	-	-	-	-	-

HF, hospital facility; OLD, opportunity to learn and develop; PA, physician autonomy; POS, perceived organisational support; PSM, public service motivation; PW, paperwork; RC, relationship with colleagues; RR, rewards and recognition; WB, work–life balance; CA, Cronbach's alpha; CR, composite reliability; AVE, average variance extracted; PC, patient centricity; WE, work engagement; HT–MT, heterotrait–monotrait

Structural model

This study performed coefficient determinant or R^2 to measure accuracy and Q^2 to measure the cross-validated redundancy of the model. Priorly, the inner variance inflation factor (VIF) test was conducted to check multicollinearity issues. The findings showed all the constructs had inner VIF below 5 as suggested (Hair et al., 2019); thus, it can be said that there is no multicollinearity issue found in this model. The result found that PC had $R^2 = 0.713$ and was categorised as moderate accuracy of the estimation (Hair et al., 2019). Thus, it can be said that the respective model has adequate capability to estimate PC. Work engagement had $R^2 = 0.579$, indicating that it had a moderate accuracy. Furthermore, WE had a large effect size on PC with an f^2 value of 2.484.

The out-of-sample redundancy value was applied from the blindfolding feature of PLS-SEM (Hair et al., 2019). All the Q^2 are found > 0, whereas PC shows $Q^2 = 0.597$ and was categorised as large value (> 0.5). Work engagement has $Q^2 = 0.494$. Therefore, it can be said that endogenous constructs in the out-of-sample model approach have sufficient cross-validated redundancy.

Hypothesis testing by bootstrapping feature was conducted to determine the association of the variables in the model and confirm whether the hypothesis proposed in this study was supported. The bootstrap approach was used to establish the significance of the data analysis in PLS-SEM (Memon et al., 2021). The cut-off value of T-statistics > 1.645 (one-tailed with alpha 0.05) and accordance with confidence interval (CI) 5% and CI 95% direction with the directional hypotheses were used as a criterion to determine whether the hypothesis is significant (Hair et al., 2019; Sarstedt et al., 2022). The results are shown in Table 3.

It can be seen in Table 3 that there are eight hypotheses supported by T-statistics > 1.645 and $p < 0.05$, with positive or negative direction (coefficient, CI 5% and CI 95%) following the directional hypotheses. The other two hypotheses such as H6 and H9 were not supported. The coefficient of PA to WE was 0.474, greater than others in estimating WE. Given its predominant relationship with WE, the authors did a subgroup analysis of PA with the other variables in this study and found that differences in employee

length of service led to differences in PA in its contribution to WE and vice versa. Emergency physicians with more than 5 years of service had a standardised coefficient of PA 2.98 times higher than those with less than 5 years of service (0.763 vs. 0.256). Because of its prominent relationship with WE, the authors did a subgroup analysis of PSM dividing the respondents into two categories, high PSM and low PSM, based on the average of their scores in the concerned variable. Emergency physicians with high PSM had a standardised coefficient of PA 6.11 times higher than emergency physicians with low PSM (0.757 vs. 0.124). This shows the contribution of PSM to PA in estimating WE. Moreover, it was found that POS and RC were higher in respondents with high PSM. R^2 for the WE variable in respondents with high PSM was higher than low PSM (0.854 vs. 0.382), which was categorised as substantial strength of relationship, giving the interpretation that this research model was more accurate when applied to respondents with high PSM.

Furthermore, mediation analysis was also carried out to determine the mediation significance through the specific indirect effects, as recommended by Nitzl et al. (2016). Based on the result of mediation analysis in Table 4 as below, WE as the mediator construct tested had T-statistics above 1.645 thresholds for the supported hypotheses. This result indicates that WE is proved as a significant mediator towards PC.

Importance–performance map analysis is a useful tool to identify indicators, providing input to managers to prioritise their improvement activities (Ringle & Sarstedt, 2016). This

TABLE 4: Specific indirect effect.

Path	Standardised coefficient	T-statistics
Physician autonomy → Work engagement → Patient centricity	0.401	4.122
Public service motivation → Work engagement → Patient centricity	0.374	2.839
Work–life balance → Work engagement → Patient centricity	0.236	2.717
Relationship with colleagues → Work engagement → Patient centricity	0.264	2.193
Perceived organisational support → Work engagement → Patient centricity	0.264	2.768
Rewards and recognition → Work engagement → Patient centricity	0.017	0.174
Opportunity to learn and develop → Work engagement → Patient centricity	0.199	2.316
Paperwork → Work engagement → Patient centricity	-0.226	1.805
Hospital facility → Work engagement → Patient centricity	0.042	0.336

TABLE 3: Hypothesis test result.

Hypothesis		Standardised coefficient	T-statistics	CI 5.0%	CI 95.0%	Result
H1	Physician autonomy → Work engagement	0.474	4.364	0.314	0.668	Hypothesis supported
H2	Public service motivation → Work engagement	0.443	2.866	0.237	0.747	Hypothesis supported
H3	Work–life balance → Work engagement	0.279	2.709	0.142	0.484	Hypothesis supported
H4	Relationship with colleagues → Work engagement	0.312	2.203	0.113	0.570	Hypothesis supported
H5	Perceived organisational support → Work engagement	0.313	2.772	0.129	0.494	Hypothesis supported
H6	Rewards and recognition → Work engagement	0.020	0.174	-0.136	0.237	Hypothesis not supported
H7	Opportunity to learn and develop → Work engagement	0.235	2.312	0.067	0.402	Hypothesis supported
H8	Paperwork → Work engagement	-0.268	1.809	-0.506	-0.006	Hypothesis supported
H9	Hospital facility → Work engagement	0.050	0.336	-0.205	0.277	Hypothesis not supported
H10	Work engagement → Patient centricity	0.844	31.825	0.796	0.885	Hypothesis supported

CI, confidence interval.
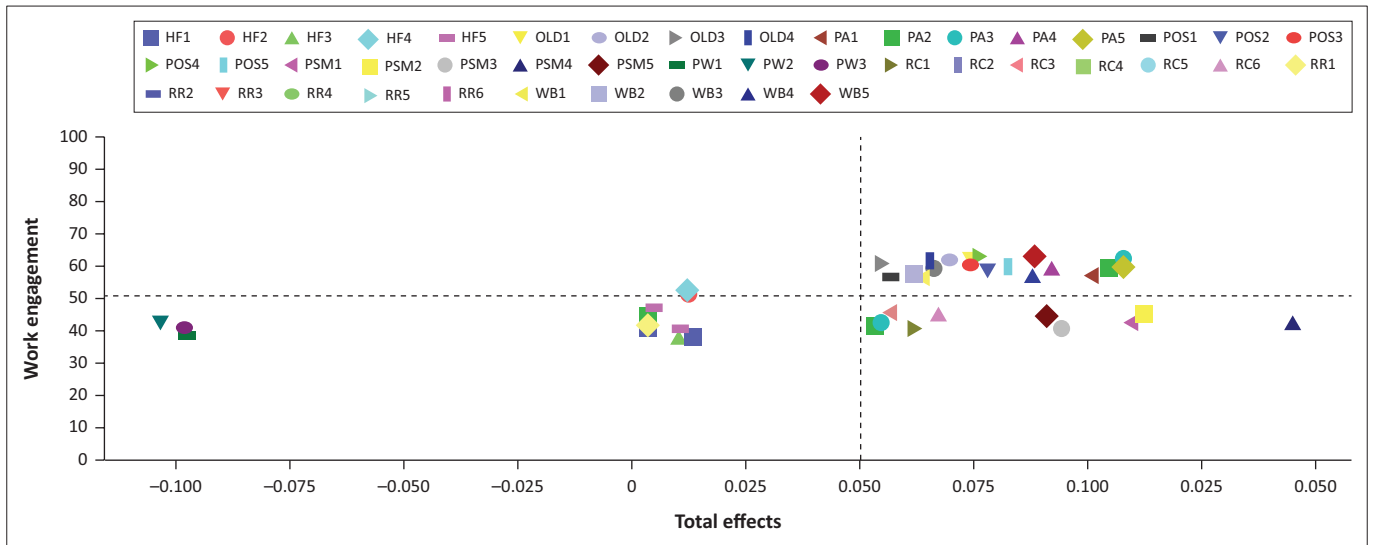
HF, hospital facility; OLD, opportunity to learn and develop; PA, physician autonomy; POS, perceived organisational support; PSM, public service motivation; PW, paperwork; RC, relationship with colleagues; RR, rewards and recognition; WB, work–life balance.

FIGURE 2: Importance–performance map of indicators.

method is based on the importance that resulted from the total effect and performance based on the mean value. Importance–performance map analysis could be seen as four quadrants, whereas the focus is more on the quadrant with indicators that have more importance, whether the performance is sufficient or vice versa. Figure 2 shows the mapping to identify the respective indicators that need to be maintained or improved.

This graphic illustrates an indicator to which hospital management must pay more attention. Indicator PSM4, which contains respondents' responses that serving public health would give them good feelings even if they were not paid enough for it, is not sufficient. Therefore, this matter needs to be prioritised by policymakers and hospital management because it is considered important for emergency physicians but has not shown adequate performance.

As seen in the data analysis from SmartPLS 3.3.8, the empirical model can be described as the following (Figure 3). Work engagement and PC have moderate strength of relationship. Therefore, this research model can be suggested for research on WE and PC of emergency physicians.

Discussion

The research model was empirically tested on emergency physicians in hospitals in underdeveloped regions to answer the question of whether the antecedents of WE as an independent variable through its mediating variables can have an impact on PC. Patient centricity as a new construct becomes an important outcome target as a marker of quality of care. This is following the concept of antecedents and impacts of WE (Saks, 2019) and the concept of PC (Srivastava & Singh, 2020).

This study focuses on the concept of patient-centred care, especially in underdeveloped regions with a growing

healthcare industry, and it requires a great deal of improvement in the quality of its services. On this basis, there will be differences in the meaning of respondents' perceptions of the antecedents of WE. From the empirical model, it is known that from 10 hypotheses, 8 significantly support the direction of the hypotheses, such as the positive association of PA, PSM, PSM, RC, POS and OLD toward WE, the negative association of PW toward WE and positive association of WE toward PC.

Physician autonomy has the predominant relationship with WE compared to other independent variables. These results are in line with previous research conducted by Zhang et al. (2021) with a population of volunteer physicians in Wuhan, China, which also demonstrates the role of PA. These results also confirm social cognitive theory, which says that social cognitive ability is related to a person's specific behaviour (Bandura, 1982). In this study, this behaviour can be reflected as WE in the healthcare industry. In the context of physicians working in underdeveloped regions, PA might be related to positive thoughts, which then drive motivation at work. This can be reflected by the PA3 indicator, which is the most important from this construct to make physicians feel more autonomous in carrying out their profession.

Positive thoughts formed from well-maintained autonomy will form optimism that will help them in completing work. In this case, leadership will play a very important role. To deepen these findings, a subgroup analysis was performed on the perception of emergency physicians based on the length of service. It was found that the perception of emergency physicians who had worked longer was better than those who had not worked for a long time. This can be related to schedule control and work experience, which is more dominated by superiors so that it provides conditions that give a better perception of autonomy in their work, which is in line with the concept of a superior–subordinate
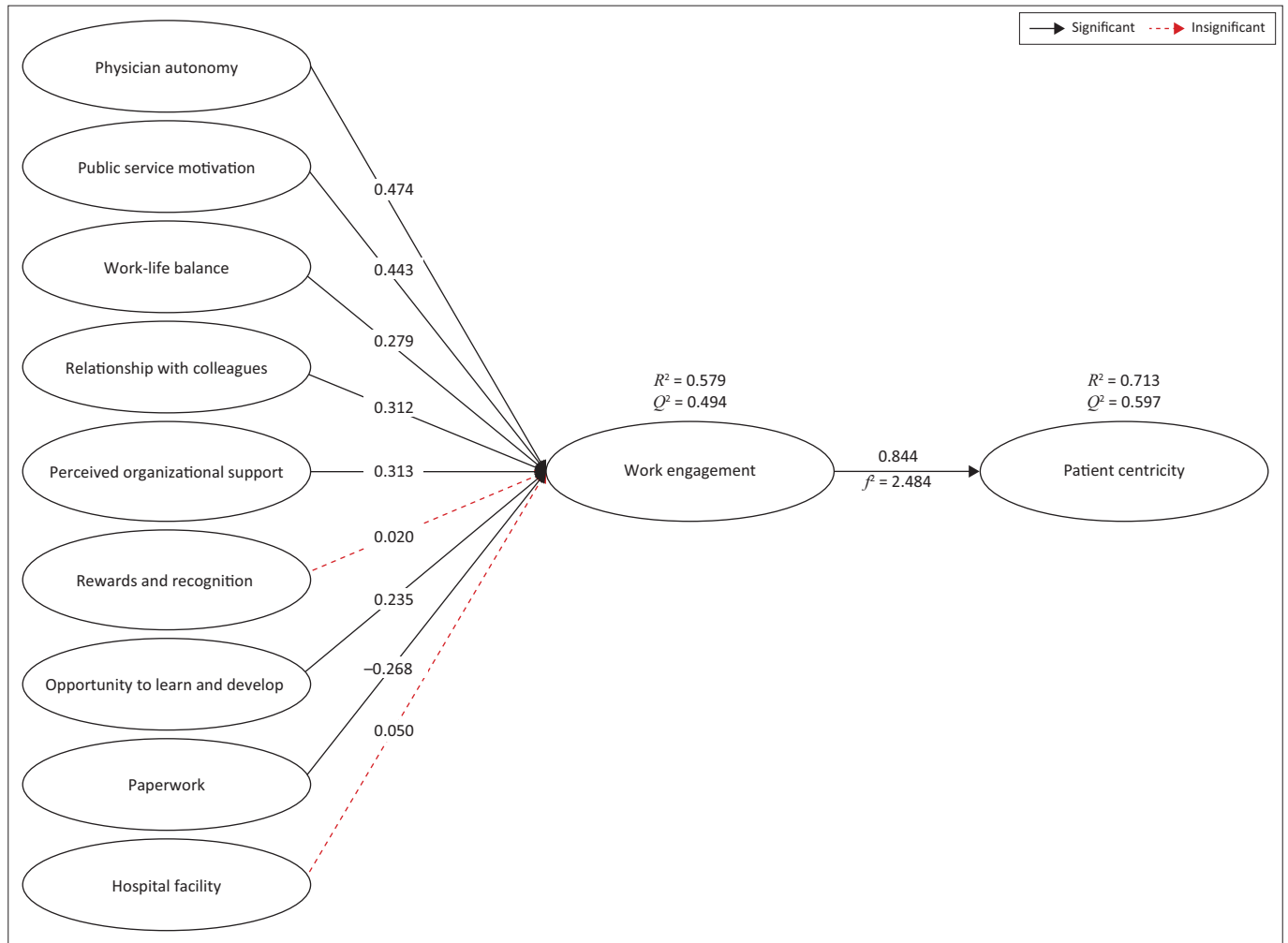
FIGURE 3: Empirical model.

relationship. On the other hand, this research model is also in line with the job demand–resource (JD–R) model that autonomy can help employees to achieve a balance between work and personal time. The two things above will contribute to the length of service of the employees, so a significant difference can be seen in this study.

Public service motivation also has a prominent relationship with WE. This result is in line with previous studies. Cooke et al. (2018) analysed the relationship between PSM as an antecedent of WE in executive workers from public sector organisations through the SEM approach. Their results support that PSM is more likely to be an antecedent of WE than a moderating variable. This is also reinforced by De Simone et al. (2016) with the finding of a positive correlation between PSM and WE. These results show the importance of PSM to be part of the application of the JD–R framework by Bakker and Demerouti (2007), that WE can occur when an employee has adequate personal resources to face challenges in his work. Therefore, it is important to evaluate the motivation of healthcare employees and whether their values are consistent with organisational goals, especially during the recruitment and selection process. This implication is also reinforced by the IPMA results at the indicator level, which

show that the PSM4 indicator is the most important thing and its performance needs to be improved to support optimal WE through good recruitment procedures. Based on the subgroup analysis, it was found that PSM has a contribution to PA in its association with WE. This is in line with previous research by Yu (2021), which revealed the involvement of the agency-stewardship concept in the linear relationship between PSM and PA. Higher POS and RC in respondents with high PSM show the relationship between personal and job resources in increasing WE, not only as a direct effect on WE but also as an indirect effect. Public service motivation as a variable that is still not widely studied, especially in the health sector, needs to be observed in further research.

Moreover, this study also proves the significant relationship of five other independent variables such as WB, RC, POS, OLD and PW. This finding is in line with previous research in the context of HRs that these variables play a significant and positive role in WE (Apaydin, 2020; Harcourt & Abimbola, 2022; Imran et al., 2020; Scheepers et al., 2017; Žnidaršic & Bernik, 2021). However, there are two variables with insignificant relationships in this study, such as RR and HF. Considering that this research was conducted in underdeveloped areas, physicians who work in their

respective units will generally lower their expectations of the quantity and quality of existing health facilities. Reinforced by the limited number of hospitals, physicians generally understand that the rewards they can achieve are limited to the existing health facilities in their area.

The new contribution of this research is to show a new approach where WE can estimate PC. The model is categorised as moderate strength of relationship ($R^2 = 0.713$) with large effect size ($f^2 = 2.484$). In the out-of-sample prediction method, the model quality was assessed by the cross-validated redundancy value shown by Q^2. The Q^2 value obtained in this research is 0.597, showing the validity of the model when there is a parameter change. Thus, this model can be considered adequate in estimating PC in emergency physicians and can be suggested to be replicated and tested in a larger and more diverse population of physicians in future studies.

There were limited studies confirming factors directly related to PC from the physicians' perspectives. Previous studies were more focused on patients' perspectives (Scheepers et al., 2017). Therefore, these findings can contribute to the repertoire of HR management. In the end, patients will evaluate services based on what they receive, which perception comes to their mind from services provided by health workers, in this case, physicians. Physicians who are more engaged with their work will tend to provide better services by PC. This research provides a new perspective on how good WE can be a benchmark for a long-term outcome regarding healthcare quality.

Limitations and recommendations

In this study, several research limitations can be identified as a concern for further research with similar topics related to WE and PC. Firstly, the sample of this study came from one province with a variety of hospital types and numbers of emergency physicians in each hospital, which affected the duration of work and work-related stress faced by each respondent who participated in this study. Therefore, it can be suggested in further research to take the respondents from the same hospital type and scale, so that the sample will be more representative with more stringent criteria. Secondly, the majority of respondents in this study were 20–29 years old. This can affect the results because of different perceptions. Therefore, it is recommended to involve respondents of more diverse ages to get more accurate results in future research. Thirdly, this study has limitations in the sampling method carried out through an online questionnaire, which was thus conducted because of the COVID-19 pandemic. Questionnaires conducted online have a weakness where the condition of the respondents cannot be known with certainty. Emotional factors or the respondent's mood when filling out the questionnaire can affect the results. A suggestion for further research is for data to be collected or questionnaires to respondents face to face, while still implementing community health protocols.

Based on the results of the subgroup analysis in this study, testing the model using the length of service as control or moderating variable is also suggested, considering the differences in the results obtained in respondents based on the length of work, both on intrinsic and extrinsic factors affecting WE. Moreover, PSM can be beneficial as one of the antecedents of WE in future research, because this study has proven the importance of PSM in creating WE in health workers. Furthermore, more research is needed to analyse the relationship between PC and patient experience to assess differences in service quality from the perceptions of health workers and patients. Finally, this research model can be used for other research involving more developed areas to assess the relationship between WE and PC.

Conclusion

Eight out of 10 hypotheses were proven to be supported with significant and appropriate directions of relationship. This research model has moderate strength of relationship and large cross-validated redundancy on PC as the dependent variable. Therefore, this model is replicable for further research with different populations. Based on the results, PA and PSM are two factors with the most predominant positive relationships on WE of emergency physicians, followed by POS, RC, WB and OLD. Paperwork showed a negative connection that weakens the WE.

Hospital management needs to pay attention to the well-being of emergency physicians, particularly in making decisions according to their respective competencies, which will have an impact on experience and confidence in serving patients. It also needs to look at the work motivation of emergency physicians, especially during the recruitment and selection process, and needs to assess whether the personal values of the employees concerned are consistent with organisational goals. To reduce the potential for disengagement because of PW, hospital management can apply to the health office to employ administrative staff who specifically work on administrative matters related to claims or counting consumables in the unit concerned, providing a computerised system in the form of digital applications to simplify the tasks. At the level of policymaker, the local public health officials can evaluate the emergency physicians who will be or have been placed in the area concerned through the assessment of PSM. Maintaining the quality of the existing WE antecedents can support the achievement of an optimal PC.

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Competing interests

The authors have declared that no competing interests exist.

Author's contributions

A.A. constructed the manuscript, gathered the data and managed the data analysis. F.A. together with A.A. managed the data analysis and supervised consolidating this article for publication.

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Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Disclaimer

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Appendix

TABLE 1-A1: Measurement of work engagement and patient centricity.

Variables	Indicators
Physician autonomy	The clinical judgment that I make can be taken into consideration for other disciplines.
	Restrictions on prescriptions or procedures do not limit the quality of care I provide.
	I have the freedom to refer or consult my patients and receive referrals when needed.
	The hospital where I work does not limit my freedom in clinical practice which is listed as my competency.
	I can openly propose my work schedule at the hospital.
Public service motivation	Making a difference in society means more to me than personal achievements.
	I try to put duty before self.
	Doing good deeds is definitely more important to me than doing well financially.
	Serving public health would give me a good feeling even if I wasn't paid enough for it.
	I am one of those rare people who would risk personal loss to help someone else.
Work–life balance	I am not bothered by the demands of work in the hospital.
	It's not hard for me to take time off when needed.
	My job does not interfere with my personal time.
	My work schedule provides enough time for me to gather with my family.
	Disruption of personal time by work is not a problem for me.
Relationship with colleagues	While working, it is easy for me to communicate with my colleagues from various disciplines.
	I feel valued by my colleagues.
	I get along well with my colleagues.
	My colleagues provide support for my career development in the work I do.
	My colleagues provide support for my work and personal time balance.
	I have the opportunity to discuss difficult cases with my colleagues.
Perceived organisational support	The hospital where I work cares about my well-being.
	The hospital where I work respects my opinions.
	The hospital where I work is like a second home to me.
	The hospital will help me when I need it.
	If I make a mistake, the hospital can provide an opportunity for me to correct the error.
Rewards and recognition	The salary and benefits that I get from the hospital are in accordance with the proportion of my work.
	The salary and benefits that I get from the hospital are in accordance with my abilities and experience.
	The salary and benefits I get from the hospital are always received on time.
	I get protection while working in the hospital.
	I feel appreciated by the hospital management for the hard work I have done.
	The promotion policy at the hospital where I work is fair and in accordance with performance and abilities.
Opportunity to learn and develop	I get the opportunity from the hospital to receive training and further education in accordance with my field of interest.
	I get a rewarding job challenge related to my field of interest in the hospital.
	I feel the tasks assigned by the hospital make me more developed.
	I am involved in scientific events organised by the hospital.
Paperwork	I do not feel burdened with administrative work at the hospital where I work.
	I do not feel disturbed by the request for the completion of documents for the claim of patient care.
	I do not feel burdened with work related to accreditation at the hospital where I work.
Hospital facility	Medical equipment and materials are always available at the hospital whenever I need them.
	I have adequate space to carry out assessments and procedures in the hospital.
	Repair of damaged medical equipment is carried out quickly by the hospital.
	Calibration of medical devices is routinely carried out at the hospital where I work.
	The hospital provides funds for the procurement of new facilities that support the services I perform when needed.
Work engagement	At my work, I feel bursting with energy.
	At my job, I feel strong and vigorous.
	I am enthusiastic about my job.
	My job inspires me.
	When I got up in the morning, I feel like going to work.
	I feel happy when I am working intensely.
	I am proud of the work that I do.
	I am immersed in my job.
	I get carried away when I am working.
Patient centricity	The ER team at the hospital where I work attains a better job level through high equipment utilisation.
	The ER team at the hospital where I work attains a better job level by eliminating waste.
	The ER team at the hospital where I work has a responsive attitude for patient safety.
	The ER team at the hospital where I work has a caring and courteous nature.
	The ER team at the hospital where I work attains a higher clinical quality than others.
	The ER team at the hospital where I work attains minimum treatment errors and better efficiency.

Source: Adapted from Fida and Najam (2019), Zubair et al. (2021), Irawanto et al. (2021), Mehta (2020), Atingabili et al. (2021), Baqir et al. (2020), Vuong et al. (2021), Lovakov et al. (2017), and Srivastava and Singh (2020).
ER, emergency room.
Note(s): All items use a five-point scale ranging from 'strongly disagree' (1) to 'strongly agree' (5).