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Motivation, Performance, and Engagement: Key Factors in Healthcare Delivery

Abstract. *Performance is important in healthcare, as it affects patient outcomes, including their safety and satisfaction. This study aims to examine the relationships between motivation, academic/professional engagement, and performance among healthcare personnel across three reference periods: the first years of medical studies, the period preceding the COVID-19 pandemic in Romania, and the period during the pandemic. Data were collected using a self-administered online questionnaire distributed on a voluntary basis, and the final sample included 828 respondents from the Romanian healthcare sector. The proposed relationships were tested using Partial Least Squares Structural Equation Modeling. The results indicate that engagement is positively associated with performance across all three periods and mediates the relationship between motivation and performance. The findings also show that intrinsic motivation is more consistently associated with engagement and subsequent performance, while the contribution of extrinsic motivation is less stable across the analysed periods. In addition, academic performance is positively related to later professional performance, suggesting continuity in the development of competencies over time. The originality of the study lies in its comparative multi-period perspective, which captures these relationships across distinct stages of medical career development within a single analytical framework.*

Keywords: *healthcare, services, motivation, engagement, COVID-19, performance.*

JEL Classification: C10, I1, I12, I23, J24, J28.

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1. Introduction

Providing high-quality patient care is a primary responsibility of health organisations. The highest contribution to quality of care is made by health professionals, which entails a systematic concern for the measurement of performance, together with a structured understanding of how it is sustained and developed across different stages of professional activity (Ciocoiu et al., 2022). Work engagement and performance are two factors that have a direct influence on the ability of healthcare professionals to provide care at an appropriate level of quality. These dimensions define the manner in which individuals relate to their professional roles, shaping the intensity of their involvement and the consistency of their performance across different stages of their careers. In the field of health services, motivated professionals contribute to the delivery of consistent and appropriate patient care. Health care workers who are properly motivated are more likely to be engaged in their work, less likely to suffer from burnout, and provide appropriate care to their patients (De Simone, 2015).

Within the Romanian healthcare system, characterised by structural constraints, uneven resource allocation, and sustained pressure on the medical workforce, the examination of these relationships acquires a distinct analytical and normative dimension (Ștefan, Popa and Tărăban, 2023). In such a context, the manner in which different forms of motivation are translated into engagement and subsequently reflected in performance becomes closely connected to the design of institutional practices and to the formulation of policies regarding the management and development of human resources in healthcare.

Organisations and educational institutions in this field must ensure that their employees or students remain engaged at an appropriate level both professionally and academically. The configuration of such an environment supports a closer alignment between individual orientations and organisational expectations, with implications for both patient outcomes and academic or professional achievement. In the field of healthcare, some research (Ștefan, Popa and Tărăban, 2023) has been conducted regarding specific strategies that organisations and specialised educational institutions can apply to improve these factors among employees. At the same time, the existing literature tends to approach these relationships in a predominantly static manner, with limited attention to their variation across different stages of professional development and under changing contextual conditions.

In this context, the present study advances the existing body of research by proposing a comparative analytical perspective structured around three distinct temporal reference points in the professional trajectory of healthcare personnel. The analysis relies on retrospective self-assessment, allowing for the examination of perceived variations in motivation, engagement, and performance, including those associated with the period of the COVID-19 pandemic.

Thus, this study focuses on the relationship between these factors across three retrospectively assessed time periods using a structural equation modeling approach (PLS-SEM) to determine direct and indirect effects. The results obtained in the

research show the mediating role of commitment, motivation, and performance, as well as their direct and indirect impact. The findings provide a differentiated perspective on motivational procedures by situating them within distinct temporal contexts and by examining their indirect effects through engagement.

2. Literature review

Education in medicine is the basic building block of any healthcare system, and institutions such as universities are faced with the task of educating future doctors. However, as medical knowledge and practices evolve, each branch of medicine undergoes continuous development, which requires ongoing adaptation within medical education. Therefore, educational activities in medicine represent the initial stage in the formation of medical specialists. During this stage, students acquire knowledge and skills that support their subsequent integration into medical practice. Efficiently managing a medical career is associated with the development of professional performance over time. Medical career management supports individuals in making informed decisions about their career paths, facilitating the alignment between individual competencies and professional requirements (Hall, 1948).

Medical personnel have been exposed to multiple forms of professional strain, especially in light of the COVID-19 pandemic. These healthcare professionals have been at the forefront of the fight against the virus, operating under conditions characterised by elevated risk and resource constraints (Stoichitoiu and Baicus, 2021).

In Romania, healthcare personnel were significantly affected by the challenges associated with the pandemic. Many medical professionals faced constrained working conditions, including limited access to protective equipment and other necessary resources (Stoichitoiu and Baicus, 2021).

The Romanian healthcare system has been characterised by structural constraints, including limited resources, the deterioration of medical infrastructure, fluctuations in staff motivation, and a shortage of highly specialised personnel (Gora et al., 2019), conditions that constrained the system's capacity to respond to the emerging crisis. Within this context, healthcare professionals maintained a sustained level of professional involvement during the expansion period of the pandemic, despite the systemic pressures affecting the sector. Institutional responses involved the adoption of measures aimed at supporting healthcare personnel in managing their professional responsibilities under these conditions.

Motivation is associated with variations in the performance of healthcare workers. Professionals who are properly motivated tend to display higher levels of productivity and deliver care of a more consistent quality (De Simone, 2015). Within the framework of Self-Determination Theory (Ryan and Deci, 2024), the distinction between intrinsic and extrinsic forms of motivation provides a perspective for understanding how different motivational drivers are associated with performance outcomes in healthcare contexts.

In the healthcare field, motivation can be related to a variety of factors, including job satisfaction, salary and other fringe benefits, career development opportunities, and recognition or appreciation for a job well done. If healthcare professionals are motivated, they are more likely to be proud of their work, feel that they are making an important contribution to the success of the organisations in which they work, and provide excellent patient care.

Demotivated workers can become disengaged, which could lead to poor output, burnout, and high turnover rates. This may have a detrimental effect on the standard of care given to patients and overall performance (Cotel et al., 2021).

As a result, as part of their overall plan to increase productivity and provide high-quality care, healthcare institutions must place a high priority on staff motivation. This can involve investing in training and development programs for staff members, providing competitive pay and benefits, creating opportunities for career growth and advancement, and recognising and rewarding staff members for their accomplishments and contributions.

Furthermore, Lambrou et al. (2010) showed that motivation and job satisfaction can be key factors in the performance of medical professionals. Their findings indicate that job satisfaction is positively correlated with motivation and that motivation is associated with improved performance. Goncharuk (2018) conducted a study on the factors that influence the motivation of staff in the health sector. According to this study, intrinsic motivators, such as job satisfaction and sense of achievement, were stronger predictors of motivation than extrinsic motivators, such as pay and benefits. As a result of considering the results of the most important previous research, we can formulate the following hypothesis.

H1: The more motivated the medical staff, the higher their performance will be.

Professional involvement is very frequently perceived as a mediating factor in the relationship between motivation and performance for employees in organisations operating in the health field. If healthcare workers are involved in their work and their organisation, the chances of being motivated to perform at a high level increase, and this motivation can lead to optimisation of the obtained performances (Kartal, 2018).

The results of previous research (Halbesleben et al., 2004; Kartal, 2018) seem to indicate that engagement can act as a bridge between motivation and performance and can have an effect on the extent to which employees exert effort and are resilient in the face of challenges. In the case of medical professionals, engagement is a key and very important element, as it can lead to better outcomes for patients, increased job satisfaction, and reduced staff turnover.

According to the literature (Schaufeli and Bakker, 2004), there can be several types of engagement, but the most important from the perspective of our study are academic engagement and work engagement. Academic engagement is very important for healthcare workers as they continue their education, as it can have a direct effect on their level of knowledge and expertise, thus influencing the quality of care they provide to patients. Work engagement is also relevant, as it can influence

an individual's commitment to the workplace, improving the overall quality of care provided by a healthcare organisation. Taking into account the theoretical framework and previous research results, the following hypothesis is formulated:

H2: The higher the academic/professional engagement of medical personnel, the higher their performance will be.

There are several previous studies whose authors have analysed engagement as a mediatorial factor between job performance and motivation (Halbesleben et al., 2004; Wu et al., 2020). Halbesleben et al., 2004 showed that work engagement had a positive effect on job performance in medical staff and that motivation mediates the relationship. The authors showed that higher levels of work engagement resulted in higher levels of motivation, which, in turn, led to better performance at work.

The results of another study (Wu et al., 2020) showed that academic engagement was positively associated with academic performance among medical students. According to this research, self-efficacy and engagement in learning mediated the relationship between motivation and academic performance. This means that students who had higher levels of motivation also had higher levels of self-efficacy and engagement in learning, and this led to better academic performance. A series of additional elements brought the research carried out by Chung and Angeline (2010) to find out if engagement mediates the relationship between workplace resources and employee performance at work, thus marking a positive relationship between work engagement and work performance.

One reason academic engagement or work engagement can serve as a mediating factor in the relationship between an individual's level of motivation and their performance is that high levels of engagement tend to promote better learning and acquisition of knowledge and skills. Taking into account the elements mentioned, the following hypothesis is proposed.

H3: Throughout their career, the academic engagement/work engagement of medical personnel serves as a positive mediator in the relationship between their level of motivation and their performance.

The COVID-19 pandemic has greatly influenced the careers of healthcare personnel, as it has changed patient care practices, leading to changes in the duties of healthcare personnel (Stoichitoiu and Baicus, 2021). Continuing education, conferences, and seminars have been postponed or cancelled, with obvious effects on the careers of healthcare professionals. Restrictions during the pandemic have resulted in increased use of telemedicine, changing the way healthcare providers provide services. Therefore, to cope with these changes, healthcare professionals were required to demonstrate a high level of knowledge and skills, accumulated both during specialty studies and during career.

Ericsson (2007) investigated the relationship and the effects on medical expertise and clinical performance. According to the research of this author, expertise is not only a result of skill or talent, but is primarily developed through long periods of practice, which implies a constant effort to improve performance.

Also, the results of this study seem to indicate that professionals who have a much deeper knowledge base perform better.

According to some studies in the literature (Gauer and Jackson, 2019), there is a positive correlation between academic performance and work performance in the case of healthcare personnel. Gauer and Jackson (2019) appear to indicate that higher scores on the medical licensure exam were associated with better clinical performance during residency. According to the results obtained by de May et al. (2012), medical students with better exam performance had higher self-efficacy and engagement in learning, and there is a positive relationship between these and their future performance as doctors. The following hypothesis is put forward:

H4: The higher the level of knowledge and skills accumulated during medical studies, the better the set of skills and professional performance of medical personnel, and their level is a determining factor even during the period of manifestation of the effects of the COVID-19 pandemic.

3. Research methodology

3.1 Research time horizon

Although the present study can be classified as a cross-sectional study, with data collected over a relatively short period of time (October 2020 – January 2021), the questionnaire items referred to three distinct periods of professional development of medical personnel. These periods are treated as comparable stages in the development of a medical career, rather than as homogeneous chronological intervals, allowing the analysis to focus on career-stage comparability.

The first reference period (T1) corresponds to the first years of medical studies and varies across respondents depending on their professional trajectories. Given that professional experience ranges between 1 and 43 years, this period can be situated approximately between 7 and 49 years prior to data collection (1970–2014). The second reference period (T2) refers to the period preceding the first reported cases of COVID-19 in Romania, corresponding to the end of 2019 and the early months of 2020. The third reference period (T3) corresponds to the data collection interval (October 2020 – January 2021), during which the effects of the COVID-19 pandemic were already present and influenced professional activity within the healthcare system.

This design allows for the comparison of perceived variations in motivation, engagement, and performance across the three reference periods, based on retrospective self-assessment.

3.2 Research strategy and method

This study adopted the survey (as a research strategy) and the online questionnaire (as a data collection tool) because it is most often associated with positivist philosophy and the deductive approach (also adopted by this research) and

allows the collection of a large volume of data, in a standardised form and in a relatively short time (Saunders et al., 2009), thus allowing the use of statistical methods for testing research hypotheses.

Given that the investigation was conducted during the period when the effects of the COVID-19 pandemic were felt to the full, which also manifested itself in restrictions on the movement of people, the self-administered online questionnaire was selected for data collection. This decision, in addition to the known advantages of the online questionnaire, also contributed to the fact that the population targeted by the research was represented by medical personnel, who are almost impossible to approach in other ways due to their involvement in the front line in efforts to combat the pandemic.

3.3 Description of scales

The questionnaire included three distinct sections corresponding to each of the three analysed stages (T1, T2, and T3), with respondents being informed about the temporal reference of each section. Four scales were included in each of the three sections: (1) Extrinsic Motivation with six items and (2) Intrinsic Motivation with 11 items (Burduș and Popa, 2016; Hee et al., 2016; Lohmann et al., 2017), (3) Academic/Professional Engagement with nine items (Schaufeli and Bakker, 2004), and (4) Academic/Professional Performance with four items (Deng et al., 2019; Kumar and Gupta, 2019). In the context of this study, academic engagement and work engagement are approached within a unified framework, reflecting the continuity between the educational and professional stages characteristic of medical careers. Given that medical training and professional practice are closely interconnected, particularly in the case of healthcare personnel whose careers involve ongoing learning and skill development, engagement is operationalised as a broader construct encompassing both academic and professional dimensions, allowing for consistent measurement across the three reference periods. The questionnaire also included sample characterisation questions such as family traditions in the medical field, gender, background, profession, seniority in the medical field, and type of health facility.

To ensure the consistency of the research instrument, its validity and reliability were evaluated. To evaluate the validity of the content, management specialists (teaching staff from the Faculty of Management) were consulted, as well as current and future professionals in the medical field, including students from the Faculty of Medicine. Their suggestions were extremely useful in ensuring the concordance between the theoretical concepts that are the object of the investigation and their operationalisation through the items that form the measurement scales.

The survey participants were informed of the purpose of the research and the fact that their answers will be anonymous and presented only statistically, for scientific purposes. Participants were also informed that participation in the survey was voluntary. Respondents who did not agree to participate did not receive the questionnaire questions.

3.4 Population and sample research

The target population of the study consisted of medical personnel (physicians, nurses, pharmacists, etc.) working in healthcare facilities (such as hospitals, pharmacies, and individual medical practices), as well as in related organisations, including pharmaceutical companies and public institutions. Non-medical personnel from healthcare facilities were not included in the sample. Furthermore, responses from individuals who indicated a profession outside the medical field were excluded from the analysis.

Considering the specific characteristics of the target population and the constraints associated with the investigation period, a non-probabilistic sampling approach was employed. More specifically, the sample can be characterised as a convenience sample, based on voluntary participation and online distribution of the questionnaire. This approach was appropriate given the limited accessibility of healthcare personnel during the COVID-19 pandemic. The final sample size consisted of 828 respondents, which is considered adequate for the application of structural equation modelling techniques such as PLS-SEM (Hair Jr. et al., 2017).

To further analyse and validate the research hypotheses, the completeness and adequacy of the data set was first checked. Of the 960 questionnaires registered, those that belonged to people who did not meet the inclusion criteria in the sample (i.e., they are not part of the medical staff) or did not tick the option expressing their agreement to participate in the survey were successively eliminated. Cases with more than 5% missing values were also excluded, so the final sample included 828 respondents, the answers provided by them being the subject of subsequent analyses.

Table 1 presents descriptive statistics of the study respondents. Therefore, it can be seen that most of the study participants were women (71.04%) and the fewest were men (28.98%). Furthermore, most of the participants declared that they were physicians (67.75%) and nurses (22.22%) and that they came from an urban environment when they started their medical studies (78.38%). Furthermore, 547 respondents declared that they work in a hospital (66.06%), and the rest declared that they work in an individual medical office (13.52%), polyclinic/specialist clinic (8.81%), pharmacy (8.33%), and others (3.26 %). Regarding their position in the organisation, most are in an executive position (89.73%) and the fewest in a management role (10.26%).

Table 1. Descriptive statistics of the sample

Demographic variables	Characteristics	N	Share of total respondents %	Mean
Gender	Female	588	71.04%	-
	Male	240	28.98%	-
Occupation	Doctor	561	67.75%	-
	Pharmacist	83	10.02%	-
	Nurse	184	22.22%	-
The environment at the time of starting medical studies	Urban	649	78.38%	-
	Rural	179	21.61%	-
The place of work	Individual medical office	112	13.52%	-

Demographic variables	Characteristics	N	Share of total respondents %	Mean
	Polyclinic/specialist clinic	73	8.81%	-
	Pharmacy	69	8.33%	-
	Hospital	547	66.06%	-
	Others	27	3.26%	-
Position in organisation	Management role	85	10.26%	-
	Execution role	743	89.73%	-
Seniority in organisations (years)	Minimum	1	100%	7.63
	Maximum	43		
Parents' background in the field	Yes	237	28.62%	-
	No	591	71.37%	-

Source: the authors.

Also, considering their seniority in the organisations, it varied between 1 year and 43 years, the average being estimated at 7.63 years; this determines the fact that most respondents who participated in the research are relatively young in these professions. An interesting thing was to observe that almost a third of the respondents (28.62%) follow the tradition in medical care of their parents.

3.5 Data analysis

Structural equation modeling (PLS-SEM) and the SmartPLS 4 application (Ringle, Wende and Becker, 2022) were used to highlight the complex relationships in motivation, engagement, and performance throughout the medical career. Structural equation modeling (PLS-SEM) as a statistical method applied to the investigation of complex relationships existing in the case of multiple latent (unobserved) constructs in a data set. This versatile method is applied for exploratory or confirmatory purposes, creating an area of applicability in research in certain fields, including the social sciences. As suggested by Hair Jr. et al. (2017), Hair et al. (2019) and Saunders et al. (2009), this involves two main steps: (i) the measurement model (i.e., evaluation of the validity and reliability of the indicators used to measure the latent constructs) and (ii) the structural model (analysing the relationships between the latent constructs).

4. Results

4.1 Evaluation of the model

The PLS-SEM model consisted of a set of reflective latent constructs and their structural relationships, which were analysed to test the research hypotheses. Specifically, the model included two endogenous constructs, academic/professional engagement (WE) and work performance (P), measured across the three reference periods (T1, T2, and T3), as well as two exogenous constructs, intrinsic motivation (MI) and extrinsic motivation (ME), operationalised for each of the three periods.

As mentioned above, the initial step in conducting a structural equation analysis is to evaluate the measurement model. To ensure its reliability, validity, and accuracy,

recommended methods were used (Hair Jr. et al., 2017). The Cronbach alpha coefficient and composite reliability were used to assess internal consistency, with values exceeding the recommended threshold of 0.70. Convergent validity was also evaluated based on extracted average variance (AVE) and indicator loadings, which had to be greater than 0.50 (for AVE) and 0.708 (for indicator loadings).

Table 2 shows the reliability assessment of the construct. The study used various reliability measures, such as Cronbach's alpha, composite reliability (rho_a), and extracted average variance (AVE). The results showed that most of the constructs had high loadings and that the variables that did not fall within the maximum imposed value were removed from the analysis. In the final stage, the reliability measures for all the constructs were high and consistent throughout all three time periods. These findings suggest that the constructs are reliable and valid measures of the target variables and can be used further.

Table 2. Construct the reliability of the model

Constructs	Loadings	Cronbach's alpha	rho_a	AVE
ME_T1	0.729 – 0.891	0.898	0.901	0.666
ME_T2	0.725 – 0.871	0.901	0.905	0.671
ME_T3	0.711 – 0.874	0.895	0.898	0.659
MI_T1	0.794 – 0.926	0.967	0.969	0.775
MI_T2	0.815 – 0.928	0.971	0.973	0.797
MI_T3	0.783 – 0.915	0.966	0.968	0.766
P_T1	0.765 – 0.867	0.849	0.853	0.689
P_T2	0.832 – 0.902	0.887	0.889	0.748
P_T3	0.849 – 0.919	0.909	0.911	0.786
WE_T1	0.810 – 0.900	0.959	0.960	0.751
WE_T2	0.866 – 0.928	0.972	0.972	0.816
WE_T3	0.848 – 0.924	0.969	0.970	0.804

Note: rho_a = reliability coefficient; AVE = average variance extracted.

Source: authors with SmartPls 4 (Ringle, Wende and Becker, 2022).

Additionally, Table 3 presents the Heterotrait–Monotrait (HTMT) ratios for the study model, including four constructs, intrinsic motivation (MI), extrinsic motivation (ME), performance (P) and academic/professional engagement (WE), measured across the three reference periods (T1, T2, and T3). HTMT is a measure used in structural equation modeling to assess discriminant validity, which means the extent to which constructs are distinct from one another. The HTMT ratio between any two constructs should be less than 0.85 to have acceptable discriminant validity (Hair et al., 2019).

Table 3. Heterotrait-Monotrait Ratio (HTMT) of the model

	1	2	3	4	5	6	7	8	9	10	11
ME_T1											
ME_T2	0.777										
ME_T3	0.729	0.910									
MI_T1	0.731	0.541	0.512								
MI_T2	0.526	0.722	0.623	0.741							

	1	2	3	4	5	6	7	8	9	10	11
MI_T3	0.518	0.655	0.763	0.696	0.842						
P_T1	0.505	0.516	0.470	0.431	0.465	0.415					
P_T2	0.378	0.519	0.503	0.349	0.468	0.485	0.707				
P_T3	0.359	0.468	0.468	0.308	0.434	0.488	0.620	0.868			
WE_T1	0.474	0.487	0.445	0.622	0.648	0.575	0.539	0.389	0.342		
WE_T2	0.423	0.564	0.506	0.571	0.701	0.658	0.451	0.527	0.485	0.685	
WE_T3	0.384	0.534	0.558	0.492	0.606	0.677	0.425	0.521	0.570	0.608	0.806

Source: authors with SmartPls 4 (Ringle, Wende, and Becker, 2022).

Looking at Table 3, all HTMT ratios are below the threshold of 0.85, indicating that the constructs are distinct from each other and have acceptable discriminant validity.

4.2 Testing for direct and indirect effects

The structural model in Figure 1 shows the relationships between motivation, academic/work engagement, and performance throughout the medical career in the three periods analysed. Thus, the strengths of the relationships between the constructs are presented, including the direct and indirect effects, which are further analysed. The model can also be used to assess the significance of each parameter estimate.

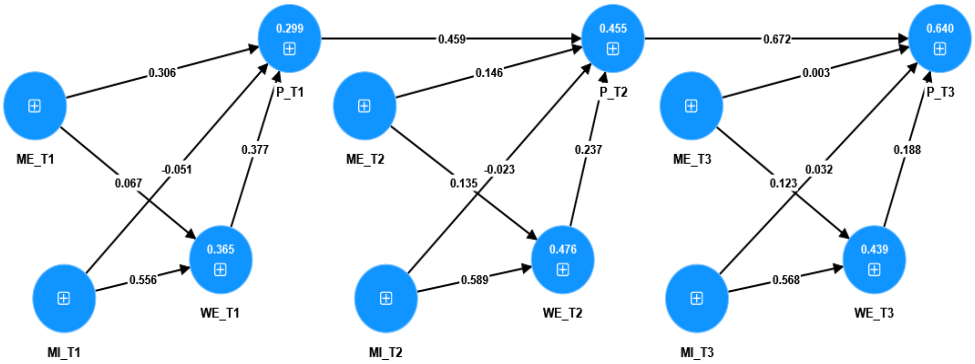

Figure 1. PLS-SEM Structural model

Source: authors with SmartPls 4 (Ringle, Wende and Becker, 2022).

The results of direct effects (Table 4) tested in Hypotheses H1 show that the relationship between extrinsic motivation (ME) and performance (P) is significant and positive during the first and second periods ($\beta = 0.307$, $p < 0.001$; $\beta = 0.146$, $p = 0.001$), supporting hypothesis H1. In contrast, there was no significant direct relationship between intrinsic motivation (MI) and performance (P) during the first and second periods, ($\beta = -0.052$, $p = 0.308$; $\beta = -0.023$, $p = 0.609$). During the third period, there was no significant direct relationship between extrinsic motivation (ME_T3) and performance ($\beta = 0.004$, $p = 0.912$), and a non-significant positive relationship was observed between intrinsic motivation (MI_T3) and performance

(β = 0.031, p=0.413). The results suggest that extrinsic motivation showed a stronger direct association with performance in certain periods than intrinsic motivation in this context.

Regarding hypothesis H2, the results suggest that there is a significant positive relationship between academic/professional engagement (WE) and performance (P) at all three time points (WE_T1 → P_T1: β = 0.377, p < 0.001; WE_T2 → P_T2: β = 0.237, p < 0.001; WE_T3 → P_T3: β = 0.188, p < 0.001). Therefore, the results support hypothesis H2.

Table 4. Direct effects (H1 and H2)

Hypotheses	Relations	β	SE	T statistics	P values	BC 95% CI	
						Lower	Upper
H1	ME_T1 → P_T1	0.307***	0.045	6.758	0.000	0.216	0.397
	MI_T1 → P_T1	-0.052	0.051	1.018	0.308	-0.149	0.047
	ME_T2 → P_T2	0.146***	0.043	3.434	0.001	0.060	0.229
	MI_T2 → P_T2	-0.023	0.046	0.512	0.609	-0.112	0.067
	ME_T3 → P_T3	0.004	0.036	0.111	0.912	-0.072	0.071
	MI_T3 → P_T3	0.031	0.038	0.819	0.413	-0.043	0.104
H2	WE_T1 → P_T1	0.377***	0.038	9.805	0.000	0.298	0.451
	WE_T2 → P_T2	0.237***	0.042	5.700	0.000	0.154	0.318
	WE_T3 → P_T3	0.188***	0.036	5.221	0.000	0.115	0.258

Note: β = standardised path coefficient; SE = standard error; BC 95% CI = bias-corrected 95% confidence interval; ***p < 0.001.

Source: authors with SmartPls 4 (Ringle, Wende and Becker, 2022).

Analysing further Table 5 shows the indirect effects of the model, testing the third hypothesis (H3), which states that the relationships between extrinsic/intrinsic motivation and performance are mediated by academic/work engagement. The indirect effect is the effect that occurs between the predictor variable (ex/intrinsic motivation) and the outcome variable (performance) through the mediator variable (academic/work engagement) (Wu et al., 2020).

The results indicate significant indirect effects of intrinsic motivation (MI) on performance (P) through academic/professional engagement (WE) across all three analysed time periods (T1, T2, and T3). The magnitude of these effects varies across periods. This pattern suggests that intrinsic motivation operates through engagement as a mechanism linking individual orientation to performance outcomes. Specifically, for MI, the indirect effect of MI on work engagement and subsequently on job performance is stronger (MI_T1 → WE_T1 → P_T1: β = 0.210, p < 0.001; MI_T2 → WE_T2 → P_T2: β = 0.139, p < 0.001; MI_T3 → WE_T3 → P_T: β = 0.107, p < 0.001) compared to extrinsic motivation (ME).

Table 5. Indirect effects (H3)

Relations	B	SE	T statistics	P values	BC 95% CI	
					Lower	Upper
ME_T1 → WE_T1 → P_T1	0.025	0.016	1.616	0.106	-0.006	0.055
MI_T1 → WE_T1 → P_T1	0.210***	0.026	8.112	0.000	0.164	0.263
ME_T2 → WE_T2 → P_T2	0.032**	0.010	3.137	0.002	0.015	0.056

Relations	B	SE	T statistics	P values	BC 95% CI	
					Lower	Upper
MI_T2 → WE_T2 → P_T2	0.139***	0.026	5.345	0.000	0.091	0.194
ME_T3 → WE_T3 → P_T3	0.023**	0.008	2.761	0.006	0.008	0.040
MI_T3 → WE_T3 → P_T3	0.107***	0.023	4.663	0.000	0.065	0.155

Note: β = standardised path coefficient; SE = standard error; BC 95% CI = bias-corrected 95% confidence interval; ***p < 0.001.

Source: authors with SmartPls 4 (Ringle, Wende and Becker, 2022).

Finally, Table 6 presents the direct and indirect effects of academic and professional performance (H4). Therefore, in the first situation (P_T1 P_T2) a significant positive direct effect is manifested (β = 0.460, p < 0.001), indicating that academic performance in the first period has a significant positive effect on performance in the second period. The second situation (P_T2 → P_T3) shows a significant positive direct effect (β = 0.672, p < 0.001), indicating that performance in the second period has a significant positive effect on professional performance in the third period.

Table 6. Direct and indirect effects – Academic and professional performance

Relations	β	SE	T statistics	P values	BC 95% CI	
					Lower	Upper
P_T1 → P_T2	0.460***	0.037	12.478	0.000	0.387	0.529
P_T2 → P_T3	0.672***	0.028	23.642	0.000	0.617	0.727
P_T1 → P_T2 → P_T3	0.309***	0.031	9.998	0.000	0.251	0.371

Note: β = standardised path coefficient; SE = standard error; BC 95% CI = bias-corrected 95% confidence interval; ***p < 0.001.

Source: authors with SmartPls 4 (Ringle, Wende and Becker, 2022).

And finally, the third relationship (P_T1 P_T2 → P_T3) shows a significant positive indirect effect (β = 0.309, p < 0.001), indicating that academic performance in the first period has a significantly positive indirect effect on professional performance in the third period through its effect on performance in the second period.

5. Discussions

The results of the analysis suggest the presence of a structured relationship between motivation, engagement, and performance, which remains observable at different stages of professional development. The first hypothesis (H1), which proposes that higher motivation leads to better performance, was only partially supported. This partial support indicates that the relationship between motivation and performance is not uniform across motivational dimensions but varies depending on the type of motivational drivers involved. While consistent with previous findings (Chung and Angeline, 2010; Halbesleben et al., 2004; Wu et al., 2020), the present results suggest that intrinsic and extrinsic motivation do not contribute equally to

performance, pointing to a differentiated effect that is not always emphasised in existing studies.

The positive association between motivation and performance during the early stages of medical training (T1) suggests that motivational processes are embedded in the initial formation of professional competencies, with effects that extend beyond the academic context and influence subsequent performance trajectories. The identification of engagement as a mediating mechanism (H3) across all three periods supports the interpretation that motivation is not directly translated into performance, but operates through a process of involvement that shapes how individual resources are activated and sustained across the three reference periods. In this sense, engagement can be interpreted as an operational mechanism through which motivational orientations are transformed into observable performance outcomes.

From a theoretical perspective, this pattern is consistent with the assumptions of Self-Determination Theory (Ryan and Deci, 2024), which emphasises that intrinsically motivated behaviours are more likely to be internalised and sustained, particularly when supported by engagement-related processes. The persistence of these relationships during the period associated with the COVID-19 pandemic indicates that the relationship between motivation, engagement, and performance is maintained under conditions of increased uncertainty and pressure.

The second hypothesis (H2) regarding the relationship between engagement and performance was confirmed for all three periods analysed. Although consistent with previous research (Halbesleben et al., 2004; Kartal, 2018), the results also indicate that the strength of this relationship varies across periods, suggesting that engagement is sensitive to contextual and career-stage-related factors. The variation observed across the three periods can be interpreted in relation to both the stage of professional development and the external constraints associated with the healthcare environment, particularly during the pandemic, indicating that engagement reflects both individual and contextual influences.

Regarding hypothesis H4, the results indicate a positive association between academic and subsequent professional performance, suggesting continuity in the development of competencies at different stages of the medical career. This finding supports the interpretation that early academic performance is not an isolated outcome, but part of a cumulative process that contributes to professional effectiveness over time. At the same time, the confirmation of this relationship suggests that the transition from academic to professional contexts does not involve discontinuity in performance dynamics, but rather a reconfiguration of competencies within different institutional settings.

These findings are consistent with existing studies that conceptualise engagement as an intermediary process linking motivation to performance. Empirical evidence provided by prior research (Chung and Angeline, 2010; Halbesleben et al., 2004; Wu et al., 2020) supports the interpretation that engagement functions as a mediating pathway through which motivational processes are translated into performance outcomes, a pattern that is further reinforced by the present results across multiple temporal reference points.

Beyond the confirmation of established relationships, the results also suggest the need to more clearly differentiate between intrinsic and extrinsic motivational processes in explaining performance outcomes. Although extrinsic motivation appears to be more directly associated with performance in certain periods, intrinsic motivation operates more consistently through engagement, indicating distinct pathways through which these forms of motivation influence behaviour.

6. Conclusions

The present research examines the relationships between motivation, engagement, and performance across different stages of the medical career, as reflected in three reference periods. The results indicate a positive association between academic and subsequent professional performance, suggesting continuity in the development of competencies over time. Early academic performance is associated with later professional outcomes, both directly and through its relationship with engagement.

The findings also suggest that intrinsic motivation is more consistently associated with engagement and, subsequently, with performance, while the contribution of extrinsic motivation appears to be less stable across the analysed periods. This pattern supports a differentiated interpretation of motivational influences in the context of healthcare professions.

At the same time, the results confirm the mediating role of engagement in the relationship between motivation and performance, in line with previous research (Chung and Angeline, 2010; Halbesleben et al., 2004; Wu et al., 2020). The persistence of this relationship across all three periods indicates that engagement remains associated with performance outcomes under varying contextual conditions, including those specific to the COVID-19 pandemic.

6.1 Theoretical and practical implications

From a theoretical perspective, the study contributes to the existing literature by providing a structured analysis of motivation, engagement, and performance in multiple stages of professional development. The results support the view that the relationship between motivation and performance is not uniform but varies according to the type of motivation and the level of engagement. The distinction between intrinsic and extrinsic motivation offers a perspective on how different motivational orientations are associated with performance outcomes, particularly in the context of healthcare professions.

In addition, the integration of academic and professional engagement within a unified analytical framework reflects the continuity between educational and professional stages, contributing to a more coherent conceptualisation of engagement in medical careers.

From a practical perspective, the findings suggest that healthcare organisations and educational institutions should consider the role of engagement in shaping

performance outcomes over time. Interventions aimed at supporting intrinsic motivation and sustained engagement may contribute to improved performance, both during the educational phase and in professional practice. The results also indicate the relevance of maintaining engagement under conditions of increased pressure, such as those associated with crisis situations, in order to support consistent performance in healthcare settings.

6.2 Limitations and future research directions

The study is subject to several limitations that should be considered when interpreting the results. First, the research is based on a single-country context, which may limit the generalisability of the findings to other healthcare systems or cultural environments. Second, the use of a non-probabilistic sampling approach based on voluntary participation limits the extent to which the sample can be considered representative of the broader population of healthcare professionals. Third, although the study examines three distinct reference periods, the data were collected at a single point in time and rely on retrospective self-assessment. This approach may introduce potential biases related to the subjective reconstruction of past experiences. In addition, the use of a single data collection instrument raises the possibility of common method bias, which may influence the observed relationships between the analysed constructs.

Future research may extend the present analysis by examining these relationships in different institutional and cultural contexts, as well as by employing longitudinal research designs that allow for the direct observation of changes over time. Further studies may also explore additional factors that influence the relationship between motivation, engagement, and performance, such as job demands, organisational resources, and individual differences.

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