Original Article

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Adaptation of the PERMA-Profiler for Measuring Well-being among Healthcare Professionals at a Tertiary Care Teaching Hospital in Kerala, India: A Cross-sectional Study

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ABSTRACT

Introduction: The well-being of healthcare employees is crucial for their work performance, the quality of care they provide, and their ability to manage patient stress in high-pressure environments. The Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment (PERMA) model is multidimensional. However, there is limited research on its applicability within the Indian healthcare context, where hierarchical organisations and professional pressures may impact employee well-being.

Aim: The present study aimed to evaluate the reliability and validity of the Workplace PERMA-Profiler among Healthcare Workers (HCW) in Kerala, India and to develop a culture-specific tool to assess and enhance their well-being.

Materials and Methods: The current cross-sectional study was conducted at Amala Institute of Medical Sciences in Kerala, India from August to December 2021, involving 406 participants including doctors, house surgeons, nursing staff, and Ayurveda practitioners. Out of these, 330 completed the 23-question questionnaire based on the Workplace PERMA-Profiler, assessing well-being on an 11-point scale (0-10). Mean scores for each factor were calculated, and participants were analysed by designation and department. The internal consistency of the Workplace PERMA-Profiler was evaluated using Cronbach's alpha, and Confirmatory Factor Analysis (CFA) for 15 items was performed to confirm 5-factor structural validity. Model fit was assessed using indices such as χ^2, Comparative Fit Index (CFI), Tucker-Lewis index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardised Root Mean Square Residual (SRMR). A p-value of <0.05 was deemed statistically significant.

Results: Cronbach's alpha (α) ranged from 0.31 to 0.90, with strong model fit indicated by CFI and TLI above 0.9, and square root mean square residual values below 0.06. The root mean square error was about 0.05. The highest correlation was observed between meaning and accomplishment (ρ=0.746), and accomplishment and happiness (ρ=0.673), and females exhibit a larger representation of positive well-being (Very high and high functioning), with males being more focused on the normal functioning category (p-value=0.012). The first CFA of the PERMA profiler showed that most items load adequately on their intended latent factors. The factor loading (β) ranged from 0.31 to 0.85 for positive emotion and 0.637-0.76 for accomplishment. Professors and associate professors exhibited high levels of well-being.

Conclusion: Senior residents, especially those under 30, reported lower well-being compared to professors, who enjoyed greater satisfaction and emotional stability. This suggests a need for mentorship and support to improve well-being and foster a healthier clinical workforce.

Keywords: Indian healthcare, Positive emotion, Engagement, Relationships, Meaning and accomplishment model, Work-life balance

INTRODUCTION

Subjective Well-Being (SWB) is defined as an individual's total assessment of their quality of life, incorporating cognitive evaluations such as life satisfaction alongside emotional components, which include the regular experience of positive emotions and a relatively lower presence of negative emotions [1,2]. This concept encompasses a cognitive aspect that reflects how one perceives their life satisfaction, alongside a hedonic aspect that weighs the positive and negative emotions encountered in daily life.

Seligman's PERMA model identifies five components of well-being viz., positive emotions, engagement, relationships, meaning, and achievement [3]. Healthcare professionals often endure long hours and limited support, making work-life balance vital for health [4,5]. The prevalence of moderate depression, anxiety and Post-Traumatic Stress Disorder (PTSD) in HCWs across 21 countries, as per a systematic review and meta-analysis, revealed 21.7% prevalence of depression, 22.1% of anxiety and 21.5% of PTSD [5].

Identifying and quantifying symptoms of depression and anxiety, limited solely to psychological distress, are evaluated by Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7) and do not evaluate positive mental health constructs like life satisfaction, purpose, or resilience. Thus, for long-term functioning and quality of life, relying solely on symptom-based measures, may underestimate recovery and overlook strengths. This gap is addressed by flourishing, by capturing positive psychological capacities and SWB that aligns with modern, holistic models of mental health [6,7].

Symptom-based scales are traditionally concerned with deficits, what is missing or dysfunctional. Although significant, these scales might miss what right, positive functioning, resilience, life satisfaction, social connectedness, sense of purpose, and personal achievement [8]. The PERMA-Profiler, conversely, enables researchers and practitioners to assess well-being by providing a more comprehensive perspective on the matter, rather than focusing solely on psychopathology [9]. This is in line with the increased understanding in the mental health literature that the emphasis should be on flourishing and not only on minimising distress.

With regards to HCWs, long working hours, experiencing stress, emotional strain, and a lack of support often come as a challenge;

the holistic measurement of well-being is even more urgent [10,11]. Negative emotional states that are associated with a decrease in positive emotions, impaired cognitive functioning, and weakened interpersonal relationships are sadness, anxiety, and anger. Research indicates that negative emotions lead to a decline in concentration and task efficiency and have an effect on attention and memory. This, in turn, has been linked to interpersonal conflicts, reduced quality of relationships and lower work engagement, which directly correspond to key PERMA domains, including positive emotion, engagement, and relationships, highlighting that negative emotional states erode fundamental aspects of psychological well-being. Thus, emphasising the PERMA model, to enhance the well-being of healthcare professionals [12-16].

PERMA domains affect socioeconomic diversity by modifying engagement and perceived accomplishment, by their influence on workload and occupational stress. PERMA-Profiler has largely involved small or homogeneous samples that have relied on internal consistency measures, mainly. The English PERMA measure was validated in the Hindi version, in Indian adolescents (13-18 years), which was school-based, requiring item reduction, but its results reported acceptable fit and reliability, which limits direct generalisation to adult workplace settings such as healthcare. The factorial validity in Indian emerging adult women by Shaik A et al., examined and reported that, although a five-factor structure could be supported, discriminant validity was inadequate across several PERMA factors and convergent validity was limited, indicating potential cultural/construct overlap and the need for further testing in other Indian subpopulations [17,18]. The present study aimed to evaluate the reliability and validity of the Workplace PERMA-Profiler among HCWs in Kerala, India and to develop a culture-specific tool to assess and enhance their well-being.

MATERIALS AND METHODS

The current cross-sectional study was conducted at Amala Institute of Medical Sciences in Kerala, India from August to December 2021. Approval for the present study was granted by the Institutional Ethics Committee (Ref.No.11/IEC/21/AIMS-38) in February; 2021. Written informed consent was taken, and confidentiality was maintained.

Inclusion criteria: The inclusion criteria included all health care professionals of both genders willing to participate. Doctors, nurses, hospital Auxiliary Nurse Midwife (ANM), hospital lab technician, hospital staff and ayurveda staff were included in the study. Their age ranged between 18 and 65 years.

Exclusion criteria: The exclusion criteria included participants who were not willing to participate. Universal sampling was employed in this study, and no formal sample size calculation was performed.

Study Procedure

A pre-validated self-administered questionnaire with 23 questions from The English Workplace PERMA-Profiler was utilised in the present study [12]. Permission was obtained from the original PERMA authors to reproduce or adapt the tool. This PERMA Profiler was translated into Malayalam. The forward/back translation was done according to the World Health Organisation (WHO) Guidelines for Translation and Adaptation of Instruments, which emphasised. These guidelines are especially relevant in the Indian and Kerala healthcare context, where language nuances, collectivism, and workplace hierarchy influence well-being perceptions [19]. Bilingual translators executed two independent forward translations, one with expertise in healthcare and the other without, to ensure both conceptual accuracy and linguistic neutrality.

Two independent translators who were blinded to the original scale back-translated this version. It was compared with the original source to ensure conceptual equivalence across the PERMA domains like Positive Emotion, Engagement, Relationships, Meaning and Accomplishment. Minor adjustments were made in wording for improved clarity and cultural relevance without altering the intent of the constructs. The finalised pre-test version was then reviewed by experts and underwent cognitive debriefing.

The cognitive debriefing was performed with Malayalam-speaking HCWs to evaluate the clarity, relevance, and interpretability of the items and response options. Minor wording adjustments were implemented based on participant feedback, without modifying the underlying constructs. Responses were categorised by endpoints and rated on an 11-point scale (0="never/terrible/not at all"; 10="always/excellent/completely"). Responses were labelled P1-P3, E1-E3, R1-R3, M1-M3, A1-A3, N1-N3, H1-H3, and Lon, along with an overall well-being measure. Average scores were calculated to assess job satisfaction and overall well-being [13]. The CFI and TLI values were considered>0.95 and RMSEA and SRMR values<0.06 to indicate good model fit [20].

STATISTICAL ANALYSIS

Statistical analysis was performed using R version 4.5.1. All the score were expressed as mean and standard deviation. To test reliability, the internal consistency of the workplace PERMA-Profiler was assessed by calculating Cronbach's alpha values for the total score and individual factor scores (i.e., P, E, R, M, and A). To confirm the 5-factor structural validity of the instrument, CFA was conducted for the 15 items using robust maximum-likelihood estimation. The original 5-factor model and a 1-factor model were tested using the following model fit indices: the χ^2 test, CFI, TLI, root RMSEA, and SRMR. Spearman's rank correlation was used to assess the correlation between the demographic variables and the well-being using the PERMA model. A p-value of<0.05 was considered statistically significant.

RESULTS

The reliability analysis revealed that most subscales demonstrated acceptable to excellent internal consistency. Cronbach's alpha coefficients ranged from 0.31 to 0.90. The highest mean score among the patients was observed for happiness, followed by meaning and relationships. A moderate internal consistency for the Positive Emotion domain (P1-P3), indicated by Cronbach's alpha of 0.626, which was slightly below 0.70. The participants also experienced a moderate to high level of positive emotions, reflecting satisfactory emotional well-being although having a relatively high mean score (7.70±1.62) [Table/Fig-1].

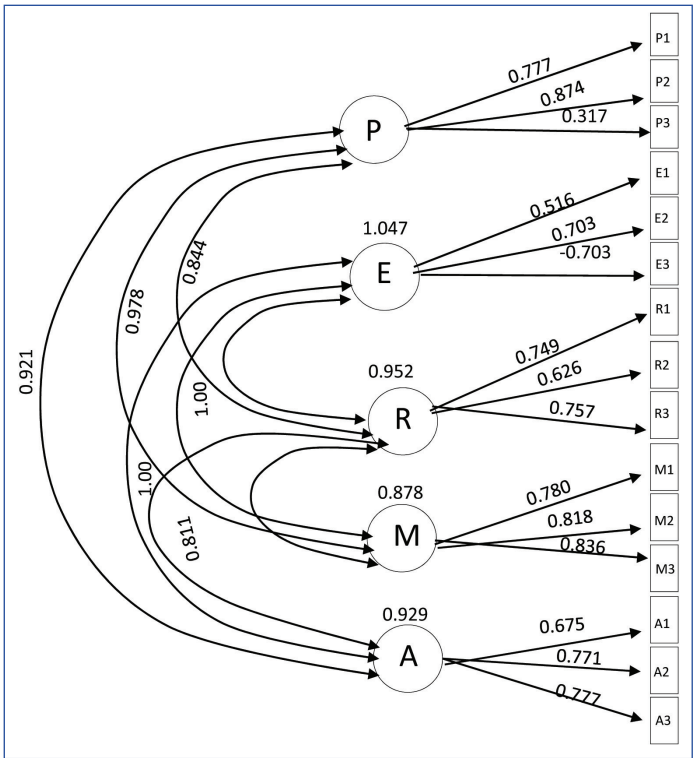
Factors	Cronbach's alpha	Mean±SD
Positive emotion		
P1	0.626	7.70±1.62
P2		
P3		
Engagement		
E1	0.299	7.35±1.42
E2		
E3		
Relationships		
R1	0.729	8.15±1.50
R2		
R3		
Meaning		
M1	0.851	8.24±1.59
M2		
M3		
Accomplishment		
A1	0.781	7.88±1.67
A2		
A3		

Happiness	-	8.25±1.65
Overall well-being (16 items)	0.909	7.88±1.30
Negative emotion (3 items)	0.741	4.71±2.16
Health (3 items)	0.881	7.55±2.02
Loneliness (1 item)	-	4.39±3.34

[Table/Fig-1]: Shows workplace PERMA-profiler-mean±SD scores and Cronbach's alpha (α).
SD-Standard deviation

The Engagement domain (E1-E3) had a very low Cronbach's alpha (0.299), meaning poor internal consistency. Although the average level of engagement measures was moderate (7.35±1.42), the low reliability should be cautiously interpreted in the results of the engagement and the necessity of the future study to further refine or even modify this domain to be more culture-specific [Table/Fig-1].

Single-headed arrows indicate factor loadings, with P's loadings ranging from 0.317 to 0.874, reflecting the correlation strength of each indicator. Double-headed arrows depict correlations between latent constructs, with values from 0.811 to 1.00, indicating strong positive relationships [Table/Fig-2].



[Table/Fig-2]: Path diagram for the Confirmatory Factor Analysis (CFA) obtained from the five factors with 15 items that include Positive emotion (P1, P2, P3), Engagement (E1, E2, E3), Relationships (R1, R2, R3), Meaning (M1, M2, M3), Accomplishment (A1, A2, A3).

The first CFA of the PERMA profiler showed that most items load adequately on their intended latent factors. The factor loading (β) ranged from 0.31 to 0.85 for positive emotion and 0.637-0.76 for accomplishment. The one-factor CFA for the PERMA profiler yielded a model chi-square of 366 (df=90, p<0.001). The CFI (0.871) and TLI (0.892) are near the conventional threshold of 0.90, suggesting an acceptable but not optimal fit. The RMSEA of 0.088 indicates a marginally acceptable fit, slightly above the recommended 0.08 cut-off, while the SRMR of 0.061 falls within the good fit range (<0.08) [Table/Fig-3].

Factors		One factor confirmatory factor			Five-factor confirmatory factor		
		B	SE	β	B	SE	β
P1	Positive emotions	1.00	–	0.760**	1.615	0.100	0.777**
P2		1.11	0.029	0.850**	1.535	0.080	0.874**
P3		0.4	0.053	0.310**	0.795	0.141	0.317**
E1	Engagement	0.74	0.046	0.560**	1.013	0.113	0.516**
E2		1.03	0.034	0.780**	1.209	0.100	0.703**
E3		-0.05	0.055	-0.030	-0.203	0.142	-0.073
R1	Relationships	0.79	0.044	0.600**	1.391	0.096	0.749**
R2		0.85	0.042	0.640**	1.320	0.114	0.626**
R3		0.87	0.041	0.660**	1.194	0.081	0.757**
M1	Meaning	1.1	0.03	0.840**	1.392	0.084	0.780**
M2		1.07	0.032	0.810**	1.406	0.080	0.818**
M3		1.02	0.035	0.780**	1.608	0.088	0.836**
A1	Accomplishment	0.83	0.043	0.630**	1.533	0.118	0.675**
A2		0.95	0.038	0.720**	1.623	0.105	0.771**
A3		0.99	0.036	0.760**	1.200	0.075	0.777**

[Table/Fig-3]: Standardised and unstandardised factor loadings of the first and five factor Confirmatory Factor Analysis (CFA) model of positive emotions, engagement, relationships, meaning, and accomplishment profiler.
One factor: **p<0.001. χ^2: 366.5, p<0.001, df: 104, TLI: 0.904, CFI: 0.871, RMSEA: 0.088, SRMR: 0.061; 5 factor: **p<0.001. χ^2: 306, p<0.001, df: 80, TLI: 0.892, CFI: 0.917, RMSEA: 0.093, SRMR: 0.052; B: Unstandardised beta; SE: Standard error; β: Standardised beta, χ^2: Model Chi-square; Df: Degrees of freedom; TLI: Tucker-Lewis index; CFI: Comparative fit index; RMSEA: Root mean square error of approximation; SRMR: Standardised root mean square residual

The one-factor model showed marginal fit (CFI=0.871, TLI=0.904, RMSEA =0.088), while the five-factor model demonstrated comparatively better but still not optimal fit (CFI=0.917, TLI=0.892, RMSEA=0.093). Although the five-factor model met the threshold for CFI, the RMSEA values for both models exceeded the conventional cut-off for good fit (≤0.06-0.08). The PERMA profiler shows generally good construct validity for its five factors. Composite Reliability (CR) values range from 0.677 for positive emotions to 0.892 for meaning, indicating reliable measurement of the constructs. Maximum Shared Variance (MSV) values indicate good discriminant validity, with MSV for engagement, relationships, and meaning at 0.828, showing these factors are related yet distinct [Table/Fig-4].

Factor	CR	AVE	MSV	Max R(H)
P	0.677	0.489	0.500	0.717
E	0.750	0.500	0.828	0.700
R	0.835	0.700	0.839	0.855
M	0.892	0.730	0.843	0.837
A	0.786	0.715	0.810	0.864

[Table/Fig-4]: Convergent and discriminant validity of the factors of the positive emotions, engagement, relationships, meaning, and accomplishment profiler.

PERMA were positively and significantly correlated with each other, indicating strong convergent validity of the Workplace PERMA-profiler. The highest correlation was observed between meaning and accomplishment (ρ=0.746), and accomplishment and happiness (ρ=0.673), indicating these elements were linked in workplace well-being [Table/Fig-5].

	P	E	R	M	A
Positive Emotion	1				
Engagement	0.524	1			
Relationship	0.580	0.358	1		
Meaning	0.648	0.462	0.700	1	
Accomplishment	0.596	0.473	0.645	0.746	1
PERMA overall score	0.823	0.657	0.802	0.866	0.849
Negative Emotion	-0.193	0.113	-0.287	-0.319	-0.221
Health	0.580	0.358	0.613	0.730	0.634
Loneliness	-0.071	0.095	-0.083	-0.106	0.016
Happiness	0.649	0.363	0.684	0.737	0.673

[Table/Fig-5]: Spearman rank Correlation (r) of the Workplace PERMA-profiler (n=327).

Of the 406 HCWs approached, 330 responded to the questionnaire. After excluding three participants with incomplete demographic information, data from 327 participants were included in the final analysis. The mean age of the participants was 35.12±10.6 years, with ages ranging from 18 to 65 years. Females constituted 78.5% (n=257) of the sample, while 21.4% (n=70) were males. Out of 327 participants, 103(31.7%) were hospital ANM staff, 107 (32.7%) were doctors and 43 (13.1 %) were House surgeons [Table/Fig-6].

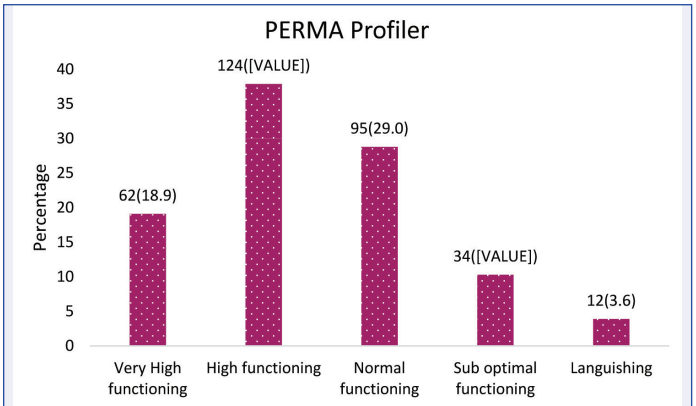
Designation	Frequency	Percent
Assistant Professor	32	9.8
Associate Professor	17	5.2
Professor	32	9.8
Senior Resident	18	5.5
PG interns	8	2.4
Ayurveda staff	9	2.8
Hospital staff	15	4.6
House Surgeon	43	13.1
Lab Technician	16	4.9
ANM Staff	103	31.5
Staff Nurse	34	10.4

[Table/Fig-6]: Designation of participants distribution (N=327).

Among professors (n=32), 11 (34.4%) were very high functioning, assistant professors (n=32) were largely in high functioning, 15 (46.9%), associate professors (n=17) had 9 (52.9%) high functioning, PG interns (n=8) showed 2 (25.0%) very high and Senior residents (n=18) were split between 7 (38.9%) high and 6 (33.3%) normal functioning, with 2 (11.1%) very high and 3 (16.7%) sub-optimal, and none languishing [Table/Fig-7-9].

Designation	PERMA Profiler				
	Very high functioning n (%)	High functioning n (%)	Normal functioning n (%)	Sub optimal functioning n (%)	Languishing n (%)
Assistant professor (32)	5 (15.6)	15 (46.9)	10 (31.2)	1 (3.1)	1 (3.1)
Associate professor (17)	1 (5.9)	9 (52.9)	4 (23.5)	2 (11.8)	1 (5.9)
PG interns (8)	2 (25.0)	3 (37.5)	1 (12.5)	2 (25.0)	0
Professor (32)	11 (34.4)	6 (18.8)	8 (25.0)	4 (12.5)	3 (9.4)
Senior resident (18)	2 (11.1)	7 (38.9)	6 (33.3)	3 (16.7)	0
Total	21	40	29	12	5

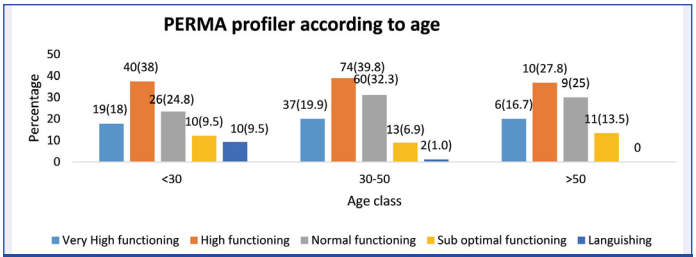
[Table/Fig-7]: Designation of participants with PERMA Profiler.
*p-value=0.292



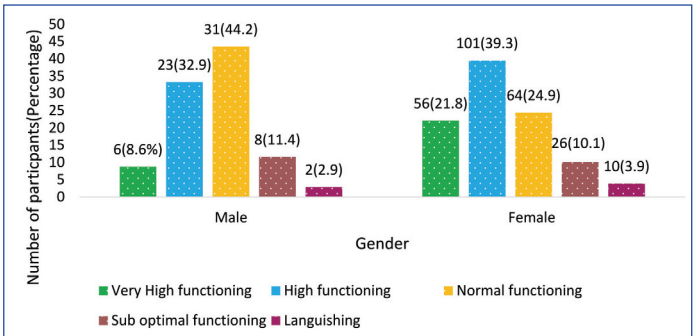
[Table/Fig-9]: The distribution of PERMA profile.

compared to older groups. Middle-aged participants (30-50 years) demonstrated the most favourable distribution, while those over 50 years showed intermediate levels of well-being [Table/Fig-10].

In comparison to males, females exhibit a larger representation of positive well-being (Very high and high functioning), with males being more focused on the normal functioning category (p-value-0.012) [Table/Fig-11].



[Table/Fig-10]: Association of PERMA profiler with age.
*Chi-square test, p-value<0.05 significant



[Table/Fig-11]: Association of PERMA profiler according to gender.
*Chi-square test, p-value<0.05 significant

Department	PERMA profiler					Total (327)
	Very High functioning n (%)	High functioning n (%)	Normal functioning n (%)	Sub-optimal functioning n (%)	Languishing n (%)	
Medical doctors	16 (36.4)	17 (38.6)	8 (18.2)	1 (2.3)	2 (4.5)	44
Surgical doctors	4 (17.4)	6 (26.1)	7 (30.4)	4 (17.4)	2 (8.7)	23
Academic doctors	1 (2.5)	17 (42.5)	16 (40)	6 (15)	0	40
House surgeons	15 (34.9)	17 (39.5)	8 (18.6)	2 (4.7)	1 (2.3)	43
Nursing	5 (14.7)	12 (35.3)	11 (32.4)	3 (8.8)	3 (8.8)	34
Hospital ANM	13 (12.6)	37 (35.9)	34 (33)	16 (15.5)	3 (2.9)	103
Hospital Lab technician	6 (37.5)	6 (37.5)	3 (18.8)	1 (6.3)	0	16
Hospital staff	2 (13.3)	9 (60)	3 (20)	0	1 (6.7)	15
Ayurveda	0	3(33.3)	5 (55.6)	1 (11.1)	0	9

[Table/Fig-8]: Distribution of departments with PERMA profiler.
p-value =0.292; #Hospital Staff included pharmacists, pharmacy assistants, and speech-language therapists

There was a statistically significant association between age and PERMA profile categories (p-value=0.019). Participants under 30 years were more likely to report suboptimal or languishing well-being

The overall well-being and PERMA scores showed clear differences across departments. Hospital lab technicians (n=16) reported the highest levels of well-being (Mean=8.42, SD=1.17) [Table/Fig-12].

Department	n	Overall well-being score-PERMA score	
		Mean	SD
Medical doctors	44	8.35	1.19
Surgical doctors	23	7.57	1.65
Academic doctors	40	7.74	1.01
House surgeons	43	8.27	1.18
Nursing	34	7.62	1.40
Hospital ANM	103	7.63	1.34
Hospital lab technician	16	8.42	1.17
Hospital staff	15	8.27	1.25
Ayurveda	9	7.49	0.96

[Table/Fig-12]: Descriptive statistics of the overall well-being score and PERMA score by department.
Kruskal-Wallis test; p-value <0.001

DISCUSSION

The pandemic has highlighted the link between social isolation and increased anxiety and depression. Job satisfaction and personal interests are crucial for happiness, as achieving goals boosts joy, while challenges can lower morale [21,22]. Seligman's PERMA model emphasised on positive emotions, engagement, relationship, meaning and accomplishment as essential for well-being. The post-pandemic landscape has prioritised HCWs' well-being [4,5] with evidence indicating that lower-tier staff well-being impacts performance [23,24]. Health challenges are complex, involving age, gender, obesity, smoking and alcohol. As the health issues of individuals are multifactorial, depending on age, gender, body mass, and lifestyle habits like smoking and alcohol use, which could affect the well-being [25], while happiness is characterised by joy, accomplishment and engagement [26].

In the present study, the Cronbach's alpha coefficients ranged from 0.31 to 0.90. Of the one-factor and five-factor models, the original five-factor hypothesised model demonstrated a marginally acceptable fit. Watanabe K et al., found the Japanese Workplace PERMA-Profiler to be reliable for job satisfaction, differing from the original PERMA model, and Cronbach's alpha coefficients ranged from 0.75 to 0.96, with the five-factor model demonstrating the best fit between the two models compared with the one-factor model, p< 0.05. The overall well-being score and five PERMA factors had strong positive correlations with job satisfaction and work engagement (0.60_*r*_0.82) [14], while in the present study, the Cronbach's alpha coefficients ranged from 0.31 to 0.90 which was lower than the Japanese study. The results with one factor and five factor model showing best fit between the two models compared with the one-factor model (p<0.001) compared to p<0.05, while in the present study, the overall PERMA score with four PERMA factors had a strong positive correlation except E having moderately positive correlation.

In a Korean study by Choi SP et al., Cronbach's alpha values for the internal consistency (reliability) of the factors ranged from 0.70 to 0.95, which was lower than the present study ranged from 0.31 to 0.90 [27]. The CFA indicated that the 5-factor PERMA model had a marginally acceptable fit (χ^2 (80) = 383.04, CFI=0.909, TLI=0.881, RMSEA=0.110, SRMR=0.054), rather than completely supporting the 5-factor structure with present study displaying that the original five-factor hypothesised model demonstrated marginally acceptable fit (χ^2: 306, p<0.001, df: 80, TLI: 0.892, CFI: 0.917, RMSEA: 0.093, SRMR: 0.052).

In the study by Chen KC et al., the respondents were male, with more than 80% were aged between 31 and 60 years, while in our study and the age was between 18 and 65 years, was conducted in various hospitals, while in the present study even though it was done only at one centre most of the respondents were between 30-50 years [28].

The study by Tandler N et al., was carried out on German-speaking adults between the age of 18 and 65 years (60.3% women), with a mean age of 38.9±10.8 years [29]. Comparatively, the current study involved participants aged between 18-65 years of age, with females constituting majority (78.9) of the sample (n=259).

In a study conducted by Vakhariya M et al., where males reported significantly higher levels of accomplishment compared to females in an age group of 20-22 years, accomplishment was strongly linked to other well-being factors, with no significant link between accomplishment and negative emotions or loneliness, on the other hand four PERMA factors had strong positive correlations, except engagement and had a moderately negatively correlated with negative emotion [30]. According to a study by Shaik A et al., age might impact the Relationship (R) domain of the PERMA-Profiler and found an acceptable model fit (RMSEA=0.078; TLI=0.90; GFI=0.91; IFI=0.93; CFI=0.93) [18]. By contrast, the original five-factor PERMA model was marginally acceptable by fit (χ^2=306, 80, p=0.001; TLI=0.892; CFI=0.917; RMSEA=0.093; SRMR=0.052), as compared to the present study.

The findings of the current study indicated high reliability and convergent validity, with adequate structural validity. The five-factor model had a marginally acceptable fit. 34.4% of professors and 15.6% of assistant professors were very high functioning, while high functioning was reported in 56.3% of associate professors, 46.9% of assistant professors, and 37.5% of postgraduate interns. Notably, 36.8% of senior residents, especially those under 30, experienced increased languishing among participants.

In a study conducted by Hu LT et al., studied the adequacy of conventional cut-off criteria and several new alternatives for various fit indexes used to evaluate model fit in practice. The results suggested, a cut-off value close to 0.95 for TLI, a cut-off value close to .08 for SRMR; and a cut-off value close to .06 for RMSEA are needed before we can conclude that there is a relatively good fit between the hypothesised model and the observed data [20]

In the present study, the one-factor model showed marginal fit (CFI=0.871, TLI=0.904, RMSEA =0.088), while the five-factor model demonstrated comparatively better but still not optimal fit (CFI=0.917, TLI=0.892, RMSEA=0.093). Although the five-factor model met the threshold for CFI, the RMSEA values for both models exceeded the conventional cut-off for good fit (≤ 0.06–0.08).

Kenny DA et al., in their study stated that the RMSEA is currently one of the most popular measures of goodness-of-model fit within Structural Equation Modelling (SEM). It is important to know how well the RMSEA performs in models with small degrees of freedom (*df*). The results indicate that when the cut-off values are used to assess the fit of the properly specified models with small *df* and small sample size, the RMSEA too often falsely indicates a poor-fitting model. We recommend not computing the RMSEA for small *df* models, especially those with small sample sizes, but rather estimating parameters that were not originally specified in the model [31].

Limitation(s)

The present study was conducted in a single centre, which restricts the generalisability of findings to other healthcare settings. The sample size was not pre-calculated, universal sampling was used, and the final sample was slightly smaller than recruited, with underrepresentation of male participants. Being cross-sectional, the design does not allow causal inference or assessment of temporal stability. Subgroup imbalance and lack of adjustment for age, sex, and designation further limit subgroup comparisons. Psychometric analysis revealed poor absolute fit (CFI/TLI<0.95; RMSEA>0.09), high inter-factor correlations suggesting weak discriminant validity, and low internal consistency in certain subscales such as Engagement and Positive Emotion. Although the five-factor model provided a

relatively better representation than the one-factor model, RMSEA values exceeded conventional cut-offs, indicating that model fit should be interpreted with caution. Cultural and occupational heterogeneity in the Kerala healthcare setting may also have influenced the Engagement and Meaning domains, contributing to residual correlations not captured by the Western-originated PERMA framework. Future research should employ larger, more diverse samples and explore theory-driven modifications (e.g., correlated error terms, second-order or bifactor models, exploratory structural equation modeling), along with methods such as Fornell-Larcker or Heterotrait-monotrait ratio of correlations (HTMT) ratios, to refine domain-specific interpretation.

CONCLUSION(S)

The validation of the PERMA-Profiler by HCWs in Kerala, India indicated that it was a culturally sensitive and psychometrically acceptable scale of multidimensional well-being among HCWs in a challenging environment. It holistically addresses major areas of well-being, and analysis of the results shows predominantly positive levels of well-being and applicability to policy formulation to support the resilience of workforce in Indian healthcare systems. Its predictability against burnout, job satisfaction, patient care outcomes, and sensitivity in longitudinal and intervention-based well-being programs need further investigation.

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