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Work Engagement, Burnout and Vigor among a Group of Medical Residents in Turkey

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Authors' contributions

This work was carried out in collaboration between all authors. NBi designed the study, wrote the protocol, and wrote the first draft of the manuscript. NBa performed the statistical analysis. HO, FD and DE managed the analyses and the literature searches of the study. All authors read and approved the final manuscript.

Research Article

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ABSTRACT

Aims: Burnout, vigor and work engagement are important issues for work related well-being. In Turkey, the well-being of medical residents is a neglected issue and no attention has been given to the evaluation of this situation. This study has two aims, first to assess the reliability and validity of the Shirom-Melamed Burnout Measure, which is a newer instrument than the Maslach Burnout Inventory, together with two other newer instruments: the Shirom-Melamed Vigor Measure and the Utrecht Work Engagement Scale-17. Secondly to determine the prevalence of burnout and work engagement and the possible factors related to burnout, vigor and work engagement among a group of Turkish medical residents.

Study Design: Cross-sectional, empirical study.

Place and Duration of Study: Teaching hospital of one university in Turkey, located at the most developed western part of the country, between September-December 2010.

Methodology: All of the registered medical residents (N=440) were included into the study. Shirom Melamed Burnout Measure, Shirom Melamed Vigor Measure and the Utrecht

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Work-Engagement Scale-17 were filled out by the participants.

Results: The results revealed all instruments to have good reliability and validity. Nearly half of the participants (49.6%) had burnout scores above than the mean burnout score of the study group and 45.1% had an average work engagement level. With an increase in age both vigor and work engagement was seen to increase. Female residents were found to be more vigorous than males. With increasing economic status, burnout was observed to decrease whereas vigor and work engagement increased. Among occupational factors, working hours were found to be positively related to burnout.

Conclusion: The situation of Turkish medical residents in terms of work related well-being is alarming. There is an urgent need for more attention and research into the effects of working conditions and subsequent solutions and interventions that would improve the working conditions of medical residents in Turkey.

Keywords: Burnout; vigor; work engagement; Shirom-Melamed burnout and vigor measure; Utrecht work engagement scale-17; medical residents; Turkey.

1. INTRODUCTION

Two different conceptualizations of burnout are available in the literature. According to one of them emotional exhaustion, depersonalization and diminished feelings of personal accomplishment are the three main components of burnout syndrome, which has been observed in all types of professions and occupational groups, although it was originally restricted to the service sector (Maslach, Schaufeli et al., 2001). The second conceptualization of burnout has mentioned burnout as an effective response to ongoing work-related stress (Moore, 2000; Shirom, 2003; Shirom, Nirel et al., 2006). The core content of this stress is the gradual depletion of individuals' coping resources. Based on the Conservation of Resources (COR) theory (Hobfoll, 1989; 2001), *burnout* is conceptualized as a multidimensional construct. The three facets of burnout are: physical fatigue, emotional exhaustion, and cognitive weariness. *Physical fatigue* refers to one's feelings of tiredness and low levels of energy in carrying out daily tasks at work. *Emotional exhaustion* refers to one's feeling too weak to display empathy to clients or coworkers. *Cognitive weariness* refers to one's feelings of slow thinking processes and reduced mental agility (Melamed, Shirom et al., 2006a; Shirom, 2003).

Vigor has been assessed in the past as a mood state with only one facet, namely that of physical strength and research in this area is constrained by the absence of a theoretical model integrating current knowledge and suggesting additional studies of vigor's antecedents and consequences (Shirom, 2011). Being vigorous denotes a combination of a positive energy balance and pleasantness or contentment and vigor represents a moderate level of arousal (Shirom, 2011). According to COR theory, vigor is conceptualized as consisting of three facets (Shraga and Shirom, 2009). These facets are physical strength that refers to one's physical capabilities, emotional energy that refers to one's ability to express sympathy and empathy to significant others and cognitive liveliness that refers to one's flow of thought processes and mental agility. Vigor has been defined as having a high level of energy, motivation to invest effort at work, and resilience and has been accepted as a part of work engagement (Bakker and Demerouti, 2008). This conceptualization of vigor combines high levels of energy with its possible consequences—motivation and resilience.

On the other hand, Shirom (2011) argued that individuals can experience vigor regardless of their psychological resilience following encounters with adverse events.

There are two opposite views of vigor's relationships with burnout. According to the bivariate approach vigor and burnout are obliquely related whereas the other bipolar approach argues that vigor and burnout are the mirror image of each other and represent the two opposite poles of the same dimension (Shirom, 2011). Meta-analyzed and qualitatively reviewed studies of effects at work supported the bivariate approach (Fisher, 2002; Thoresen, Kaplan et al., 2003). Empirical research studies that followed the bipolar approach often reverse-scored emotional exhaustion/ fatigue items used to construct a measure of vigor as the antipode of burnout (Bakker and Demerouti, 2008; Maslach and Leiter, 2008). Some studies argued that both views of vigor's relationship with burnout are valid depending on the contextual state of the person (Reich and Zautra, 2002). Shirom (2011) concluded that researchers should regard the relationship between vigor and burnout as relatively independent, and therefore adopt separate and distinct measures for them.

As a part of a more general emerging trend towards a positive psychology that focuses on human strengths rather than weaknesses, a recent development in burnout research is the shift of focus towards engagement as the other side of the coin (Seligman and Csikszentmihalyi, 2000). Engagement refers to a more persistent and pervasive affective-cognitive state and is defined as a positive, fulfilling and work-related state of mind that is characterized by vigor, dedication and absorption (Schaufeli, Salanova et al., 2002). Vigor is characterized by high levels of energy and mental resilience while working and by the willingness and ability to invest effort in one's work. Dedication is characterized by a sense of significance, enthusiasm, inspiration, pride and challenge. Absorption is characterized by being fully concentrated and happily engrossed in one's work, whereby time passes quickly and one feels stimulated. Work engagement is characterized by a high level of energy and strong identification with one's work. Burnout, on the other hand, is characterized by the opposite: a low level of energy combined with poor identification with one's work. Burnout and work engagement are two distinct concepts that should be assessed independently (Schaufeli and Bakker, 2003). In practice, however, it is likely that burnout and engagement are substantively negatively correlated.

Initially burnout was predominantly investigated in North America but during the past decade it has attracted the attention of researchers in many other countries. Nowadays burnout is studied around the globe and for almost all types of professionals. However, research on burnout among medical residents scarce comprises less than 1% of burnout literature (Prins, Gazendam-Donofrio et al., 2007; Thomas, 2004). In the last few years awareness that resident doctors may be vulnerable to burnout has grown and the number of studies focusing on burnout among medical residents appears to be on the increase.

Current knowledge on burnout in medical residents addresses widely varying burnout rates ranging from 18% to 82% with predictors described as either occupational or individual (Prins, Gazendam-Donofrio et al., 2007; Thomas, 2004). Inconsistent results on the effects of some of these factors on burnout have been reported. Stronger correlations have been found among burnout and occupational predictors such as work-home interference, work overload, increased perception of work as stressful etc. (Biaggi, Peter et al., 2003; Geurts, Rutte et al., 1999; Martini, Arfken et al., 2004). In general, none of the individual risk factors studied were found to be strongly related to burnout (Prins, Gazendam-Donofrio et al., 2007).

Few studies have been conducted on medical residents concerning the prevalence of engagement and on possible relationships between engagement and burnout. In a study of Dutch medical residents, it was found that male residents were more engaged than female residents and demonstrated more vigor and the number of years in training was slightly but significantly related to absorption and residents in general surgery were more highly engaged, vigorous, dedicated and absorbed than others (Prins, Hoekstra-Webers et al., 2010).

In Turkey burnout and work engagement among medical residents are neglected issues and the scarceness of the studies on well-being in Turkish medical residents is a reality therefore the first objective of this study was to assess burnout and engagement levels and the possible individual and occupational predictors for burnout and engagement among a group of Turkish medical residents working at a university hospital.

The second objective of the current study was to examine the factorial validity and the internal consistencies of the Turkish versions of Shirom-Melamed Burnout (SMBM) and Shirom-Melamed Vigor (SMVM) scales, which had been used for the first time in a study in Turkey.

The third objective was to examine the Turkish version of the Utrecht Work Engagement Scale (UWES), developed by Schaufeli & Bakker (2003), regarding the factorial validity and the internal consistencies of the three scales (vigor, dedication and absorption) in a culture different from that for which they were developed.

Our hypotheses were as follows:

Hypothesis 1: There are significant relationships among socio-demographic (such as age, gender, marital status, number of children, economic status, additional income) and occupational (such as number of years in training, department, working hours) characteristics and burnout, vigor and work engagement.

Hypothesis 2: The three factor structure of the SMBM (physical fatigue; emotional exhaustion; and cognitive weariness) fits to the current data.

Hypothesis 3: The three factor structure of the SMVM (Physical Strength; Emotional Energy; and Cognitive Liveliness) fits to the current data.

Hypothesis 4: The three factor structure of the UWES (vigor; dedication; and absorption) fits to the current data.

2. MATERIALS AND METHODS

2.1 Procedure and Participants

All the resident doctors registered on different residency training programs at a university hospital in Bursa/Turkey were included in the study. Approval for this study was given by the Ethics Committee of the corresponding university. Participation in the study was voluntary. A self reporting questionnaire to be completed anonymously, together with a letter explaining the goal of the study was distributed in closed envelopes to all the residents and then collected after one month. At the time of the study 440 residents were registered, of whom 164 returned a non-response from indicating that that they did not wish to participate, citing lack of time (26.7%), length of the questionnaire (25.3%) and no reason (48.0%). There were no systematic differences in terms of age, gender and working years among residents who

participated and who did not wish to participate to our study. A response rate of 62.7% was obtained from 276 completing the questionnaire. A total of 50 questionnaires had missing data and were thus excluded, leaving a total of 226 questionnaires for analysis.

2.2 Measures

2.2.1 Shirom-Melamed Burnout Measure (SMBM)

Burnout was evaluated by the SMBM. A series of studies conducted over the past 10 years, on a diverse range of occupational groups, has confirmed the three-factor structure and also a total burnout scale representing all three factors. The three subscales were as follows: the physical fatigue (PF) factor (6 items) –the frequency of feeling tired, physically drained and physically exhausted; the cognitive weariness (CW) factor (5 items) the frequency of having difficulty in concentrating and slow thinking processes; and the emotional exhaustion (EE) factor (3 items) – the frequency of feeling emotionally fatigued and emotionally burned out (Shirom, 2005; Shirom and Melamed, 2006). Responses to the 14 items in the measure were given on a 7-point scale ranging from 1 (almost never) to 7 (almost always). The mean scores of each subscale and of total burnout were calculated by totaling the item scores and dividing them by the number of items.

2.2.2 Shirom-Melamed Vigor Measure (SMVM)

Vigor was measured by the SMVM. This is a 12-item measure and has three subscales: Physical strength (PHY, 5 items); emotional energy (EE, 4 items); and cognitive liveliness (CL, 3 items). Responses were given on a 7-point scale from 1(never) to 7 (always) (Shirom, 2005). Mean scores of each subscale and of total vigor were calculated by totaling the item scores and dividing them by the number of items.

SMBM and SMVM were translated into Turkish by the standard translation, back -translation process. As cut-off points for SMBM and SMVM, the sample mean scores for total burnout and vigor were used. However some studies in the literature used the score of 75 percentile as cut-off point (Grossi, Perski et al., 2003; Jansdottir, Rödger et al., 2010; Lindström, Aman et al., 2010) in their study of burnout and risk of type 2 diabetes Melamed and Shirom et al. (2006b) used the mean score as cut-off point therefore in this study a score of above mean score referred to as a measure of burnout. Similar reference for the cut-off point of the SMVM was given by Shirom (2005). The mean scores for burnout and vigor in our sample were 3.76 and 4.07 respectively. Those who had scores above 3.76 were accepted as having burnout and those who had scores above 4.07 were accepted as vigorous.

2.2.3 Utrecht Work Engagement Scale (UWES)

Engagement was measured using the 17-item UWES. The Turkish version of the scale was obtained from the developer's website (http://www.shaufeli.com/Test_forms.htm). The questionnaire has good psychometric properties and consists of three engagement subscales: vigor (6 items), dedication (5 items) and absorption (6 items) (Shaufeli and Bakker, 2003). The sum of all items can be used as a total engagement score. The items are rated on a 7 point scale from 0 (never) to 6 (always). The item scores are totaled and then divided by the number of items in each scale. Therefore the possible range for each subscale and the total score is 0-6; higher scores denote higher engagement. The classification of UWES scores as very low, low, average, high and very high was done according to the engagement scores obtained from an international sample which is

described in the UWES Manual (Shaufeli and Bakker, 2003). As a cut-off point for work engagement we followed the instructions of the developers of this scale and those who had scores below 3.07 were accepted as having low work engagement.

2.2.4 Demographics and occupational characteristics

Participants provided information on age, gender, marital status, number of children, type of specialty and number of years in training at the time of this study, weekly working hours and additional income. For the evaluation of the economic status of the participants a self reporting 10-point scale was used (1 very bad to 10 excellent).

2.3 Analyses

We used SPSS version 13.0 (Chicago, ILL) and AMOS 16.0 package programs for the statistical analyses. Descriptive and correlation analyses were used. Confirmatory factor analysis was performed as reliability analyses of the SMBM, SMVM and UWES instruments. Linear regression was used to evaluate the possible relationships between some individual and occupational factors and burnout, vigor and work engagement. In these analyses the dependent variables were burnout, vigor and work engagement scores and the independent variables were individual and occupational characteristics.

3. RESULTS

3.1 Descriptive

A total of 51.8% of the participants were female, with the vast majority aged 26-34 years. [Mean age (mean±SD) 30.0±3.9yrs, range 23-45yrs]. Of all the participants 49.6% were married and 27.4% had children. The length of residency programs in Turkey varies between 3-5 years full-time. Participants had been in training for an average of 2.9±1.4 years (range 0 [just started] to 6 years). The mean working week was 78.9±27.6 hours (range 40 -150 hrs). More than half of the participants (52.7%) were residents in medical branches (such as internal medicine, pediatrics, family medicine, radiology, infectious diseases etc.) whereas 40.7% were in surgical branches (general surgery, heart surgery, ophthalmology, gynecology and obstetrics etc.) and 6.6% were in basic medicine (anatomy, biochemistry, genetics etc.). Only 5.3% of the participants had any income additional to their salaries. More than half the participants (55.7%) awarded themselves 5-6 points for their economic status on a 10 point scale. A summary of demographic and occupational characteristics is shown in Table 1.

3.2 Reliability and Validity of the SMBM, SMVM and UWES

The Cronbach α values calculated to assess the internal consistency were 0.96, 0.85 and 0.94 for SMBM, SMVM and UWES respectively (Table 2). These values revealed a high internal consistency of the Turkish versions of these measures.

Table 1. Demographic and occupational characteristics of the participants

	N	%	Mean±SD
Gender			
Male	109	48.2	
Female	117	51.8	
Age			
23-27 years	60	26.5	30.0±3.9
28-32 years	120	53.1	
33-37 years	33	14.6	
38 years	13	5.8	
Marital status			
Single	114	50.4	
Married	112	49.6	
Children			
One child	38	16.8	
Two and more	24	10.6	
Without children	164	72.6	
Additional income			
Yes	12	5.3	
No	214	94.7	
Speciality			
Surgical	92	40.7	
Medical	134	59.3	
Economic status*			5.2±1.6
Years in training			2.9±1.4
Weekly working hours			78.9±27.6

* For the evaluation of the economic status of the participants a self reporting 10-point scale was used (1 very bad to 10 excellent).

Table 2. Means (M), standard deviations (SD) and Cronbach α values for the Turkish versions of SMBS, SMVS and UWES

Measures	Item	M	SD	C.Alpha
SMBM	14	3.76	1.21	.96
PF(physical fatigue)	6	4.36	1.34	.96
CW (cognitive weariness)	5	3.51	1.37	.95
EEx (emotional exhaustion)	3	2.98	1.41	.93
SMVM	12	4.07	1.27	.85
PHY (physical Strength)	5	3.81	1.85	.81
CL (cognitive liveliness)	3	4.01	1.25	.92
EE (emotional energy)	4	4.44	1.31	.95
UWES	17	3.01	1.04	.94
Vigor	6	2.89	1.05	.84
Dedication	5	3.31	1.16	.86
Absorption	6	2.89	1.17	.85

3.3 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) was used to evaluate the model fit. In order to perform the CFA, AMOS 16.0 was used and the model parameters were estimated using maximum likelihood (Jöreskog and Sörbom, 2001). In this study, the adequacy of the model was assessed by: (1) Root mean square error of approximation (RMSEA) which should be below

0.08 for an adequate fit; (2) The absolute fit, χ^2/df measure that χ^2 minimum fit function test depends on sample size (Hair et al. 1998; Bollen, 1989) was used which should be between 2 and 5 for an adequate fit; (3) Goodness of fit index (GFI) which shows the amount of variance and covariance explained by the model and should be greater than 0.90 for an adequate fit of the model; (4) comparative fit index (CFI) which should also be greater than 0.90 for an adequate fitness. The fit statistics for CFA models are presented in Table 3.

Table 3. Fit indices for CFA models of SMBM, SMVM and UWES Turkish version

Model	χ^2	df	χ^2/df	GFI	CFI	RMSEA
1. Second-Order CFA for SBMB	215.59	74	2.91	.90	.96	.08
2. Second-Order CFA and correlated error for SBMB	160.85	72	2.23	.93	.98	.06
3. Second-Order CFA for SMVM	119.23	51	2.34	.92	.97	.08
4. Second-Order CFA and correlated error for SMVM	102.51	50	2.05	.93	.98	.06
5. Second-Order CFA for UWES	482.72	116	4.16	.79	.84	.11
6. Second-Order CFA and correlated error for UWES	421.39	115	3.66	.81	.87	.10

The χ^2 difference tests of differences ($\Delta\chi^2$) were used to compare these nested models. The correlated error models had a significantly better fit ($\Delta\chi^2=54.74$, $\Delta df=2$ $p<.001$ for burnout; $\Delta\chi^2=16.72$, $\Delta df=1$ $p<.001$ for vigor and $\Delta\chi^2=61.33$, $\Delta df=1$ $p<.001$ for work engagement) than those without correlated errors. It can be seen that the second order CFA models which have correlated errors were associated with the optimal fit according to all criteria for SMBM and SMVM instruments. For the UWES-17 instrument CFI and GFI indices were not greater than 0.90 and RMSEA was not below 0.08 which indicated that the three factor structure of the Turkish version of UWES-17 measure is somewhat poor.

Figs. 1, 2 and 3 represent second-order CFA and correlated errors for SMBM, SMVM and UWES

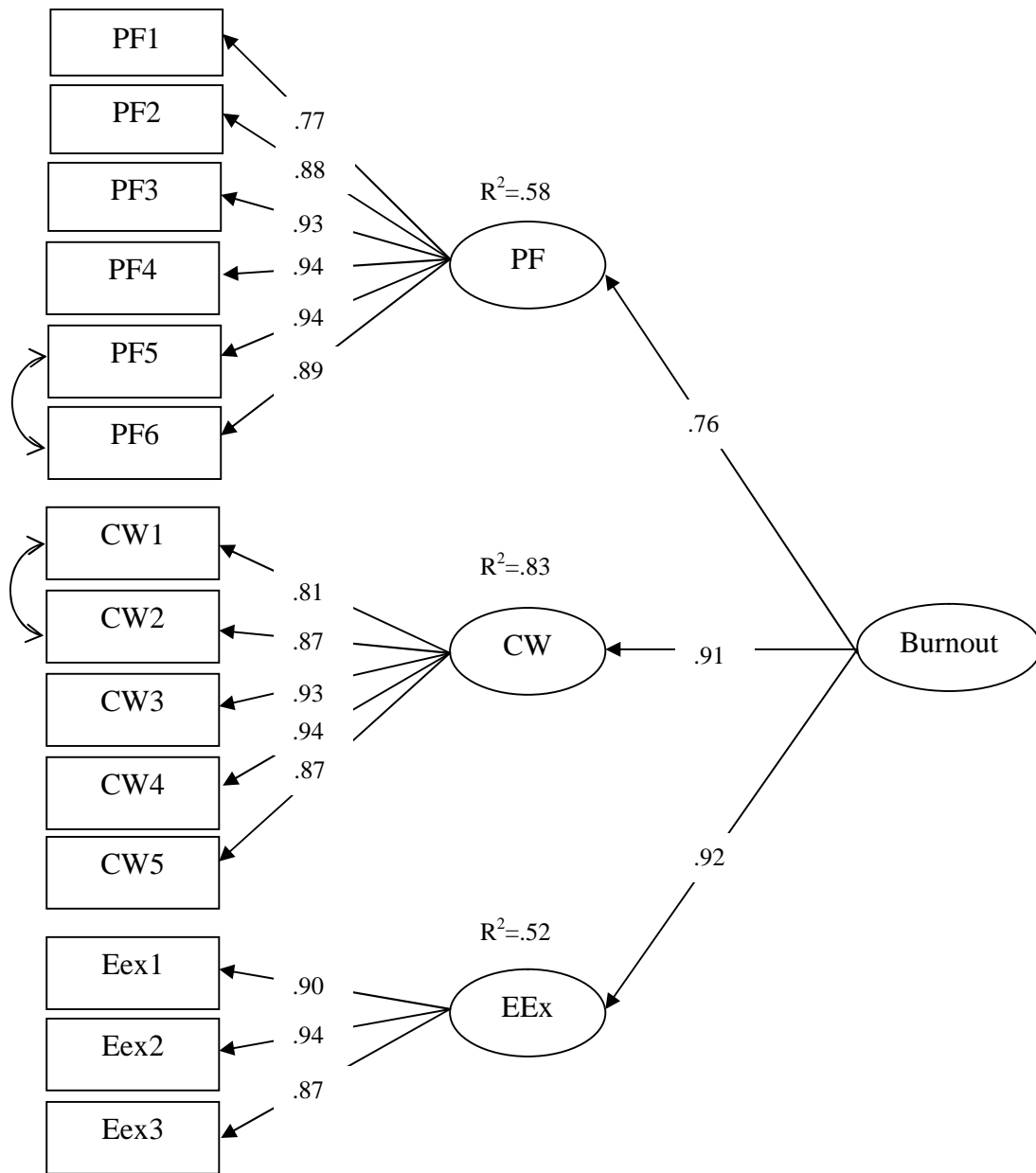


Fig. 1. Second-order CFA and correlated error for SMBM
 PF= Physical Fatigue; CW= Cognitive Weariness; Eex= Emotional Exhaustion

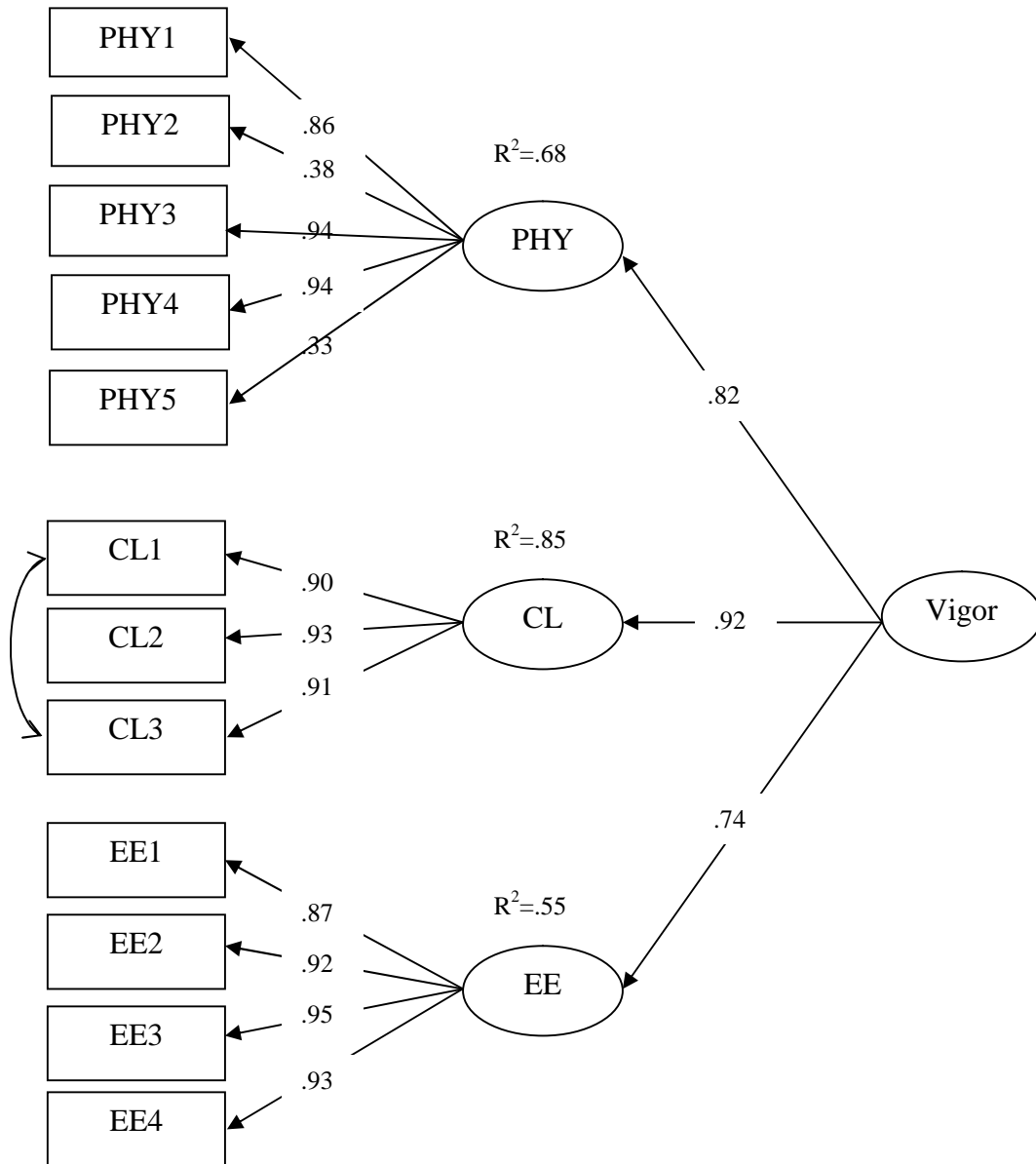


Fig. 2. Second-order CFA and correlated error for SMVM
 PHY =Physical Strength; CL=Cognitive Liveliness; EE=Emotional Energy

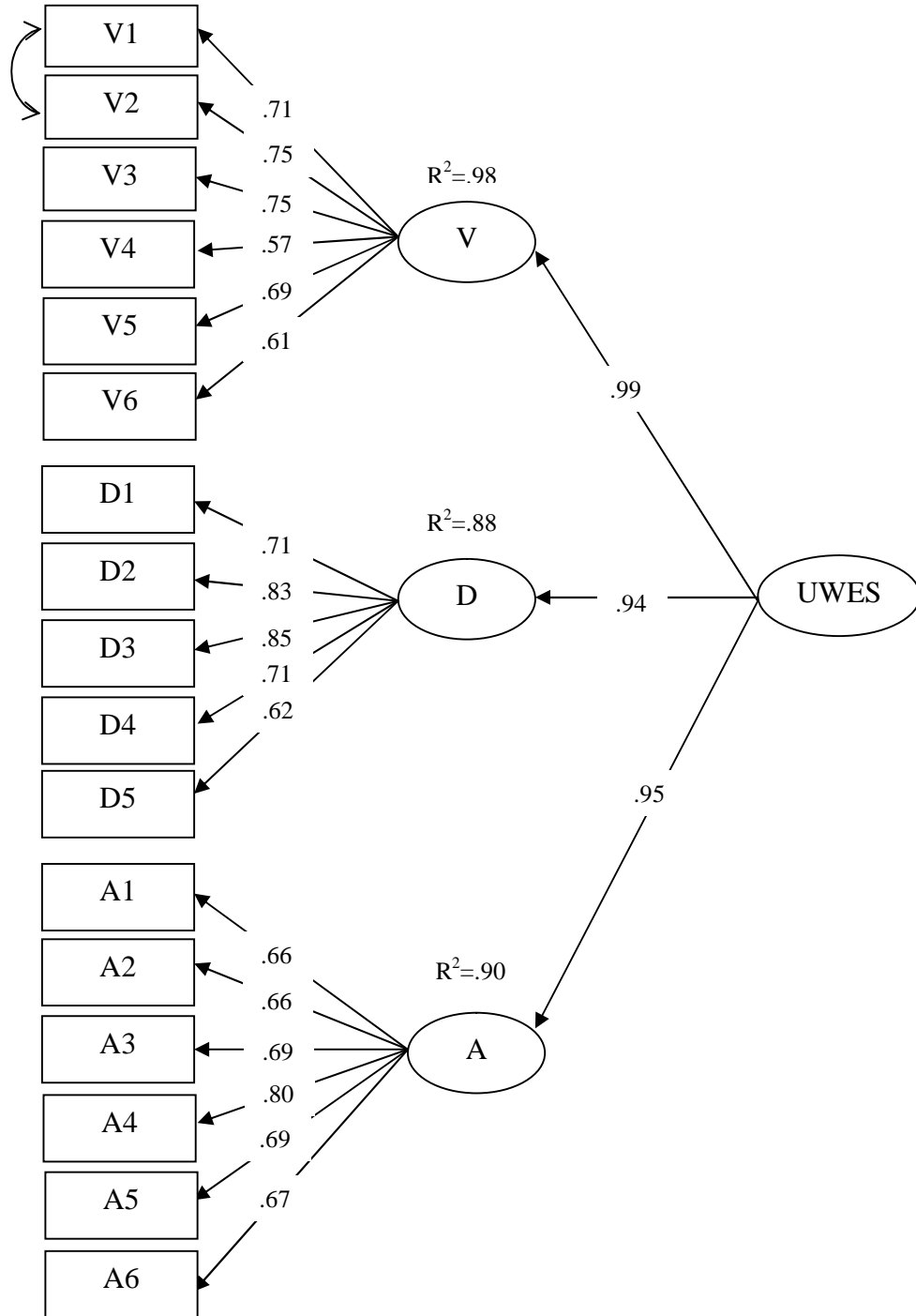


Fig. 3. Second-Order CFA and correlated error for UWES
V= vigor; D= dedication; A=absorption

3.4 Burnout, Vigor and Work Engagement Measured by the Turkish Version of SMBM, SMVM and UWES

A total of 112 residents (49.6%) had burnout and of those 51.8% were female. A total of 118 (52.2%) residents were determined as vigorous and of those 60.2% were female. Table 4 shows the norm scores of SMBM and SMVM according to gender compared to the study sample scores. The SMBM norm scores were obtained from apparently healthy 3952 female and 6714 male employees. The SMVM norm scores were obtained from apparently healthy 3923 female and 6672 male employees. These norm scores were calculated by the developers of these scales and published on the website for SMBM and SMVM (Shirom, 2005).

Table 4. Comparison of the norm and sample mean (Mean±SD) scores of SMBM and SMVM

	Male Norm*	Sample	Female Norm*	Sample
SMBM (Total)	2.04±0.78	3.86±1.30	2.32±0.86	3.65±1.11
PF(physical fatigue)	2.29±1.00	4.40±1.47	2.81±1.18	4.31±1.30
CW (cognitive weariness)	1.87±0.90	3.60±1.44	2.07±0.99	3.41±1.30
EEx (emotional exhaustion)	1.84±0.91	3.24±1.50	1.77±0.90	2.73±1.27
SMVM (Total)	5.57±0.89	3.84±1.31	5.46±0.89	4.28±1.19
PHY (physical Strength)	5.41±1.04	3.59±1.79	5.18±1.10	4.05±1.89
CL (cognitive liveliness)	5.73±0.97	3.84±1.36	5.45±1.02	4.15±1.11
EE (emotional energy)	5.63±1.09	4.14±1.40	5.83±1.01	4.70±1.15

**Norm values were calculated by the developers of these scales and are available from [http:// www. tau.ac.il/~ashirom](http://www.tau.ac.il/~ashirom)*

A total of 114 (50.5%) residents had low work engagement whereas 45.1% had average and 4.4% high work engagement. Table 5 shows the percentage distribution of residents according to work engagement levels and the norm and sample mean scores for UWES. The norm scores for UWES-17 were obtained from 12,161 individuals from 9 different countries and they are published in UWES Manual (Shaufeli and Bakker, 2003).

Table 5. Percent distribution of participants according to work engagement levels and norm and sample scores of UWES

Levels	% Distribution			
	Vigor	Dedication	Absorption	Total
Very low	24.3	9.3	12.8	14.2
Low	34.5	29.6	29.2	36.3
Average	38.9	54.4	48.7	45.1
High	2.2	6.6	8.8	4.4
Very high	-	-	0.4	-
UWES Scores	Mean ±S.D.			
Norm*	3.99±1.08	3.81±1.31	3.56±1.10	3.82±1.10
Sample	2.19±0.82	2.58±0.75	2.54±0.84	2.39±0.78

**Norm values were calculated by the developers of this scales and are available from UWES Manual*

Linear regression analyses were performed in which the dependent variables were burnout, vigor and work engagement scores and the independent variables were age, gender, marital status, number of children, additional income, training years, working hours, department and economic status (Table 6). The results were as follows:

Burnout was related to economic status and working hours. Those who had longer working hours and who had lower scores for their economic status were more burned out than those with shorter working hours and higher scores for their economic status. Other variables were found to be not significantly related to burnout.

Vigor increased with both age and a better economic situation, and female residents were more vigorous than males. Increasing working hours and years caused a decrease in vigor. Other variables were not significantly related to vigor.

Work engagement was related to age and economic status. With increasing age and economic status, work engagement increased.

Table 6. Linear regression analyses of burnout, vigor and work engagement according to several variables

	Burnout		Vigor		Work Engagement	
	Beta	p	Beta	p	Beta	p
Age	-.139	.080	.194	.014	.175	.030
Gender (female)	-.058	.400	.147	.031	.129	.065
Marital status (married)	.107	.481	-.023	.878	.004	.981
Number of children	.073	.629	.079	.596	.113	.457
Additional income (yes)	.022	.747	.012	.857	.058	.402
Economic status	-.186	.007	.186	.006	.139	.045
Speciality (medical)	.018	.674	.014	.876	.043	.401
Working hours	.191	.004	-.132	.043	-.097	.148
Training years	.064	.366	-.141	.045	.004	.959
F	2.925	.004	3.690	.000	2.189	.029
Adjusted R ²	0.10		0.12		0.08	

Age, number of children, economic status, working hours, training years are continuous variables

3.5 Correlations among SMBM, SBVM and UWES

We found significant and strong correlations among the three scales used in this study. For example, the cognitive liveliness sub-scale of SMVM was negatively correlated to the cognitive weariness sub-scale of SMBM (-0.677). The emotional energy sub-scale of SMVM was negatively correlated to the emotional exhaustion sub-scale of SMBM. The dedication sub-scale of UWES was positively correlated to the cognitive liveliness sub-scale of SMVM. All the correlations are shown in Table 7.

Table 7. Correlations among SMBM, SMVM and UWES

	PF	CW	EEX	PHY	CL	EE	V	D
Cognitive Weariness	.703**							
Emotional Exhaustion	.519**	.624**						
Physical Strength	-.620**	-.418**	-.321**					
Cognitive Liveliness	-.595**	-.677**	-.493**	.515**				
Emotional Energy	-.521**	-.515**	-.692**	.438**	.677**			
Vigor	-.701**	-.566**	-.422**	.599**	.601**	.513**		
Dedication	-.564**	-.476**	-.418**	.487**	.506**	.501**	.780**	
Absorption	-.562**	-.430**	-.356**	.507**	.486**	.452**	.797**	.749**

PF= Physical Fatigue, CW= Cognitive Weariness, EEX= Emotional Exhaustion, PHY= Physical Strength, CL= Cognitive Liveliness, EE= Emotional Energy, V= Vigor, D= Dedication
 **Correlation is significant at the 0.01 level (2-tailed).

4. DISCUSSION

The current study evaluated the prevalence of burnout, vigor and work engagement and the possible relationships of burnout, vigor and engagement with some socio-demographic and occupational characteristics in medical residents working at a university hospital in Turkey.

The study also examined the psychometric structure of the Turkish versions of a burnout measure (Shirom Melamed Burnout Measure- SMBM), a vigor measure (Shirom Melamed Vigor Measure- SMVM) and an engagement measure (Utrecht Work Engagement Scale 17- UWES-17).

The results confirmed our hypotheses. The three factor structures of the SMBM and SMVM instruments showed good fit indices to the current data. The Turkish version of SMBM and SMVM found to be reliable and valid. However the Turkish version of the UWES-17 instrument did not reveal good fit indices despite correlated errors. Similar problems with UWES-17 were shown in the studies of the developers of this instrument and it has been reported that the invariance of the three-factor structure of the UWES-17 is somewhat poor (Shaufeli and Bakker, 2003).

All sub-scales of burnout (physical fatigue, cognitive weariness and emotional exhaustion) were at least moderately correlated to vigor, dedication and absorption sub-scales of work engagement. Correlations were greater than -0.40, except the correlation between absorption and emotional exhaustion which was found to be -0.356. This hypothesis was partly confirmed by Shaufeli and Bakker (2003), although they used different burnout and work engagement scales (Maslach Burnout Inventory-student Survey and UWES-Student).

All burnout (physical fatigue, cognitive weariness and emotional exhaustion) and vigor sub-scales (physical strength, cognitive liveliness and emotional energy) were at least moderately negatively correlated, except the correlation between physical strength and

emotional exhaustion which was found to be -0.321. All vigor and work engagement sub-scales were determined as being at least moderately positively correlated.

We found statistically significant relationships between the studied dependent variables (burnout, vigor and work engagement) and some socio-demographic and occupational characteristics. These relationships are addressed in detail as follows:

4.1 Burnout

Most studies about burnout among medical residents have used the Maslach Burnout Inventory (Garza, Schneider et al., 2004; Martini, Arfken et al., 2004; Nyssen, Hansez et al., 2003; Shanafelt, Bradley et al., 2002) which is different from our study instrument. Shirom and Melamed (2006), provided evidence of the construct validity of the SMBM relative to that of the often-used Maslach Burnout Inventory, and proposed several theoretical arguments favoring the use of SMBM to gauge burnout, thus giving strong support to the use of SMBM as an alternative measure of burnout. In general, studies in western countries which have examined the effect of individual risk factors on burnout have found weak correlations. Hillhouse, Adler et al., (2000), mentioned that men reported significantly more job related burnout than women. Garza, Schneider et al. (2004) and Geurts, Rutte et al. (1999), showed that emotional exhaustion was significantly more prevalent in women. Martini, Arfken et al., (2004), found that unmarried residents had higher rates of burnout. Studies in Turkey have shown mixed results in terms of the relationship between individual factors and burnout. Ozyurt, Hayran et al. (2006), showed that younger physicians have higher levels of emotional exhaustion, depersonalization and lower levels of personal accomplishment which means higher levels of burnout. They also found higher levels of depersonalization among male physicians and higher levels of emotional exhaustion among unmarried physicians. Another study revealed a negative relationship between age and depersonalization (Aslan Gurkan et al., 1996). Among the individual factors examined in the current study, only the economic status of the residents seemed to be significantly related to burnout and an increase in the economic status diminishes burnout. No significant relationship was determined in terms of other individual factors such as age, gender, marital status and additional income.

In western literature the effect of working conditions on burnout has been well studied. Although some studies have found no significant relationship between working hours and burnout (Biaggi, Peter et al., 2003; Garza, Schneider et al., 2004; Gelfand, Podnos et al., 2004), the current study determined a significant positive relationship between working hours and burnout and this result conforms with other studies of Turkish physicians (Karlidag, Unal et al., 2000; Erol, Saricicek et al., 2007). On the other hand training years and department were not found to be related to burnout, although previous Turkish studies have found that burnout levels decreased with duration in the profession and experience (Aslan Gurkan et al., 1996; Ozyurt, Hayran et al., 2006; Erol, Saricicek et al., 2007).

4.2 Vigor

The mean total scores for total vigor and all three sub-scales (physical strength, cognitive liveliness and emotional energy) were found to be lower than the norms of SMVM which were obtained from 6672 healthy male and 3923 female employees (Shirom, 2005). Female residents were found to be more vigorous than males. This may depend on various factors, such as life satisfaction or job satisfaction which were not considered in this study but could

warrant further research. Economic status was related to vigor which increased with increasing economic status. Older residents were found to be more vigorous than younger. This may depend on work engagement hence the level of work engagement was found to increase with increasing age. On the other side increasing working hours and years were found to be negatively related to vigor. Obviously it is not possible to feel vigorous after long working hours and increase in working years may cause a loose in one's enthusiasm which diminishes vigor.

4.3 Work Engagement

It can be said that our study group was not engaged with its work as about 45.1% had an average and 50.5% a lower than average work engagement level. Of those with lower levels, the average vigor level was 58.8%, dedication 38.9% and absorption 42.0%. A study of Dutch medical residents found the mean score for total work engagement to be 4.11 ± 0.83 (Prins, Hoekstra-Webers et al., 2010) whereas in our sample this score was 2.39 ± 0.78 . Compared to Dutch medical residents the level of work engagement was lower among Turkish residents and this issue needs to be further evaluated with causes and consequences. The level of work engagement was found to increase with increasing age and economic status. Other individual and occupational factors were not found to be significant. As it stated above older residents found to be more vigorous and vigor is a component of work engagement. The increase in work engagement with increasing age could be associated with this fact. Obviously it is clear that people in a good economic condition will be happier and more satisfied than those in bad economic status. This situation may affect their work engagement level. No differences in work engagement were found among different types of specialties whereas Prins, Hoekstra-Webers et al., (2010) found that general surgery residents were more highly engaged, vigorous, dedicated and absorbed than residents in other specialties.

5. CONCLUSION

Burnout and disengagement were found to be common in the medical residents of this study. Although this sample obviously does not represent all Turkish medical residents, the results give a picture of a medical resident population who are burned out, emotionally exhausted and disengaged. This is an alarming situation as these are the future medical specialists responsible for the quality of care of patients not only now but also in the future. Further research is needed to gather more information about the influence of working conditions on well-being and patient care and to propose solutions and interventions that will improve the working situations of medical residents.

The cross-sectional and self-reporting design of this study may have caused reporting bias and should therefore be mentioned as a limitation of this study. Furthermore 37.3% of registered residents returned a non-response from indicating that they did not wish to participate and 11.4% of returned questionnaires were excluded from analyses because of missing data. If these excluded residents tended to have higher burnout and lower vigor or work engagement, the mean score of the SMBM might be underestimated and that of the SMVM or UWES might be overestimated.

It can be concluded from the findings of this study that the Turkish versions of all the instruments used to examine burnout, vigor and work engagement, namely the SMBM, SMVM and UWES were reliable, valid and appropriate to use in a different culture than that

for which they were originally developed. It is hoped that using these instruments, more studies will be performed in Turkey, thus bringing the level of research in Turkey to that of western countries.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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