Psychometric Testing of Oldenburg Burnout Inventory among Academic Staff in Pakistan

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ABSTRACT

Burnout is an emerging concept of 21st century. Its measurement and assessment has attracted the interest of scientists around the globe. Social scientists, particularly faced problems in deciding the dimensions of burnout. The most commonly used maslach burnout inventory has three dimensions, however, there are more negatively coded items in this inventory that can undermine its validity. In response oldenburg burnout inventory was developed with a uniform number of negative and positive items. It has been tested among different populations around the world with good factors structure, but it has not been tested in academia of Pakistan, especially among a diverse population of teaching staff. The current study aims at Econometric testing of oldenburg burnout inventory followed by its distribution among 450 academic staff working in six universities of Pakistan. A cross-section research design was applied. The reliability was checked through calculating inter items statistics, i.e., Cronbach Alpha and Pearson correlation coefficients, while the construct validity was determined by running Factor Analysis. The reliability analysis showed that all items had mean Cronbach Alpha Coefficient of $\Sigma\alpha = 0.83$, whereas items-total correlations ranged up to $r = 0.62$, which is evidence of its internal consistency. The results of exploratory factor analysis revealed that that factor loadings ranged from 0.57 to 0.90. Similarly, the results of confirmatory factor analysis showed that two-factor model demonstrated better fit as compared to one-factor model. The detailed econometric analysis confirmed that oldenburg burnout inventory is a reliable and valid tool for measurement of burnout in academia of Pakistan, thus it could also be successfully used in different working sectors of Pakistan for the assessment of Burnout. The findings of the current study are valuable additions into the existing body of knowledge and empirical research on the burnout inventories.

Keywords: Burnout, Reliability, Validity, Academic Staff, Univeristy
JEL Classifications: C, M1, M3

1. INTRODUCTION

In the world of occupational psychology, the burnout has become a buzz word. Both the researchers and managers are interested to know the nature, causes and consequences of burnout. It is because they all believe that burnout is something that can hamper their social and working lives, however few of them know what actually burnout means. The lack of clarification about the problem of burnout has motivated the study of burnout throughout the world. It led the researchers to thoroughly investigate the issue of burnout for its comprehensive operationalization and measurement. Since burnout has been conceptualized as multidimensional construct, therefore, researchers have developed different kinds of measurement tools for the assessment of burnout. The question arises, which one tool is reliable and correct enough to measure

the symptoms of burnout precisely. The most popular instrument for for the assessment of Burnout is a maslach burnout inventory, developed by Christina Maslach and her colleagues (Maslach and Jackson, 1986; Maslach et al., 1981; 1997). It was exclusively made for use in service professions like teaching and health care etc., It has three dimensions (sub scales), i.e., emotional exhaustion, depersonalization, and personal accomplishment (Maslach et al., 1998).

The maslach burnout inventory has certain shortcomings, like for example, it can only be used in a service profession (employees working and interacting with people), therefore, if we want to assess Burnout in other professions then we have to either make changes in maslach burnout inventory or entirely make a new instrument for assessment of burnout (Demerouti and Bakker,

2008). Another shortcoming is that the sub scales of maslach burnout inventory are unidirectional, i.e., all items of emotional exhaustion and cynicism are negatively phrased, while all items of professional efficacy are positively phrased. Such unidirectional combination of items gives poor psychometric characteristics (Price and Mueller, 1986). In response to such problems Demerouti and Nachreiner (1998, 1999) developed an alternative inventory for assessment of Burnot, names as oldenburg burnout inventory. It was initially developed in German language, but was later on translated to the English language. It has total sixteen items, which covers two dimensions of Burnout, i.e., exhaustion and disengagement (Demerouti et al., 2010). The uniqueness of this inventory is that it has both negative and positive items in both of its sub dimensions, that is why, it gives a better model fit of two factors (Timms et al., 2012).

Since its development, oldenburg burnout inventory has been tested in various studies, e.g., (Campos et al., 2012; Halbesleben, 2010; Halbesleben and Demerouti, 2005; Reis et al., 2015) for assessment of burnout in different occupations. The results of these studies revealed that oldenburg burnout inventory is econometricvalid and reliable instrument for assessment of Burnout. However, such studies were mostly conducted in Western countries and in occupations like health care and industries. Thus, there is a need of testing this instrument in Eastern culture and professions like teaching (more specifically university teaching). In this regard the current study aims at econometric testingof oldenburg burnout inventory among 450 academic staff working in six universities of Pakistan. A cross-section research design was applied. The reliability was checked through calculating inter items statistics, i.e., Cronbach Alpha and Pearson correlation coefficients, while the construct validity was determined by running Factor Analysis.The reliability analysis showed that all items had mean cronbach alpha coefficient of $\Sigma\alpha = 0.83$, whereas items-total correlations ranged up to $r = 0.62$, which is evidence of its internal consistency. The results of exploratory factor analysis revealed thatfactor loadings ranged from 0.57 to 0.90. Similarly, the results of confirmatory factor analysis showed that two-factor model demonstrated better fit as compared to one-factor model. The detailed econometric analysis confirmed that oldenburg burnout inventory is a reliable and valid tool for measurement of burnout in academia of Pakistan, thus it could also be successfully used in different working sectors of Pakistan for the assessment of burnout. The findings of the current study are valuable additions into the existing body of knowledge and empirical research on the burnout inventories.

2. METHODOLOGY

This section explains the methodology of the current study.

2.1. Research Design
The current study has utilized a descriptive cross section design. Such design can help in collecting data at a single time point from specific population (Durand and Chantler, 2014).

2.2. Data Collection
The data was collected through 16-items oldenburg burnout inventory. This inventory was initially made in German language

(Demerouti and Nachreiner, 1998, 1999). Later on, further refined by Demerouti et al., (2010) by its testing among 528 construction employees in South Arifca. The oldenburg burnout inventory is equivalent to maslach burnout inventory, however, it has total 16 items with two major dimenions, i.e., Disengagement and exhaustion, as clear from Table 1.

2.3. Population and Sampling
The population of current study consisted of academic staff members in the selected twelve universities of Pakistan. In this regard a multi stage sampling process was applied. In the first stage,three geographical regions, i.e., North Punjab, Federal Area, Islamabad and Khyber Pakhtunkhwa were chosen as clusters. Table 2 shows the details of universities with academic staff members in the three selected regions.

In the second stage, total six universities were selected on a random basis. To avoid any sampling bias, equal number of universities were selected from public and private sectors. Furthermore, to get a better presentation of the total population, only those universities were selected that were bigger in size. Table 3 illustrates the detail of six universities.

In the third stage a final sample of 450 was derived from a population of 1120 by initially dividing respondents into strata on the basis of gender and faculty positions. Later on, a Simple Random Sampling was done from each strata. The simple random sampling was applied because each respondent had an equal

Table 1: Items of oldenburg burnout inventory

Items of disengagement	Items of exhaustion
I always find new and interesting aspects in my work	There are days when I feel tired before I arrive at work (R)
It happens more and more often that I talk about my work in a negative way (R)	After work, I tend to need more time than in the past in order to relax and feel better (R)
Lately, I tend to think less at work and do my job almost mechanically (R)	I can tolerate the pressure of my work very well
I find my work to be a positive challenge	During my work, I often feel emotionally drained (R)
Over time, one can become disconnected from this type of work (R)	After working, I have enough energy for my leisure activities
Sometimes I feel sickened by my work tasks (R)	After my work, I usually feel worn out and weary (R)
This is the only type of work that I can imagine myself doing	Usually, I can manage the amount of my work well
I feel more and more engaged in my work	When I work, I usually feel energized (R)

Table 2: Universities and academic staff in selected regions

Geographic clusters	Universities	Academic staff
Federal area, Islamabad	16	2300
North Punjab	07	675
Khyber Pakhtunkhwa (Central)	13	1770
Total	36	4745

likelihood of selection from each strata. The following formula given by Yamane (1967) was applied for taking samples from each stratum:

$$n = \frac{N}{1 + N(e)^2}$$

Where as (*n*) denotes sample size, while (N) is total population and (*e*) shows the level of error (precision level) or confidence interval. In case of small sizes, the level of precision is kept high. Table 4 presents the details about sampling distribution.

2.4. Statistical Analysis
The reliability of oldenburg burnout inventory was determined by calculating Cronbach's Alpha and pearson correlation coefficients for all items. Furthermore, the inter-item correlation was also checked. On the other side, the construct validity was determined by running exploratory and confirmatory factor analyses.

3. RESULTS OF STUDY

3.1. Reliability Analysis
Table 5 presents the results of items total correlations (pearson correlation coefficients) and cronbach's alpha coefficients. The item total correlations ranged from r = 0.21 to r = 0.61 whereas the Cronbach's alphacoefficients raged from α = 0.81 to α = 0.83. Values in such range show that this scale possesses good internal consistency.

The reliability was further checked through inter scale correlation and presented the results in Table 6. The oldenburg burnout inventory was initially divided into two by taking mean scores for Disengagement and exhaustion scales, later the correlation between these scales was determined. The results show that disengagement is significantly correlated with exhaustion at 0.05 level.

3.2. Validity Analysis
Validity refers to correctness of scale, whereas a correct scale has the feature to identify any variations in the measurement (Webb, 2008). The construct validity of oldenburg burnout inventory was determined by exploratory and confirmatory factor analyses. In this regard exploratory factor analysis was run by a principal component analysis method with varimax rotation and extraction on eigenvalues was fixed to be >01. The Kaiser-Meyer-Olkin test for sample adequacy was also run, where its value is recommended be >0.50. Moreover, factor loadings should be equal or >0.50, thus indicating that data is suitable for Factor Analysis (Kaiser, 1974). Principal component analysis was run on all of the 16 items of the oldenburg burnout inventory at the same time. Table 7 presents the results. The Kaiser-Meyer-Olkin test value of 0.84 is within the desirable range. The communities range from 0.59 to 0.95. The factor loadings ranged from 0.57 to 0.90 and the eigenvalues for all the 16 items was above 01.

Confirmatory factory analysis was run to further test the overall construct validity of oldenburg burnout inventory. The following fit indices were calculated to know the overall model fit of oldenburg burnout inventory:

1. Chi-square (X^2)
2. Normed Chi-square (X^2/df)
3. Goodness-of-fit index (GFI)
4. Comparative fit index (CFI)
5. Root mean square error of approximation (RMSEA).

The results are clear in Table 8. The oldenburg burnout inventory gives good model fit in a two factor model rather than in one factor model, because one factor showed poor fit, i.e., The X^2/df was 0.6, whereas RMR was 0.022, similarly, RMESA: 0.014, CFI: 1.00 and GFI: 0.87. In contrast, the two factor model gave better fit. All of the fit indices were within acceptable ranges, therefore, the two factor model of 16 items was accepted.

The results of both exploratory and confirmatory factor analysis provides evidence that oldenburg burnout inventory possesses sufficient construct validity. Stability of the instrument's structure ensures correctness ofthe measurement during its use for the assessment of burnout among the general population.

4. DISCUSSION ON RESULTS

The current study examined the econometric properties of oldenburg burnout inventory. The results of a current study confirmed that oldenburg burnout inventory is a reliable and valid instrument for assessment of burnout among university teachers. Moreover, following its successful testing in teaching profession, the researchers will be confident in testing this instrument in other occupations. It should be further noted that the results of the current study are in concurrence with results of previous studies for example Demerouti et al., (2003) conducted a study on the convergent validity of oldenburg burnout and maslach burnout inventories among occupational groups from banking and industry. It was first ever study on validity assessment of the initial version of oldenburg burnout inventory among a diverse group of employees that consisted of clerical staff, managers, bankers, operators, biologist, pharmacists, veterinarians and insurance employees. The results of this study showed that exhaustion and disengagement were significantly related with each other, i.e., r = 0.44. The one factor model of oldenburg burnout inventory yielded poor fit, i.e., X^2/df: 5.04, whereas GFI: 0.79, CFI: 0.71 and RMSEA: 0.13. However, the revised two factor model provided much improved fit, i.e., X^2/df: 1.89, GFI: 0.94, CFI: 0.95 and RMSEA: 0.06. It was suggested that oldenburg burnout inventory has certain problems in items distribution, however, better structure fit can be achieved

Table 3: Detail of six selected universities

Universities	Type	Staff
Federal Area, Islamabad		
International Islamic University, Islamabad	Public	233
Riphah International Univeristy, Islamabad	Private	268
Punjab, North		
University of Engineering Technology, Taxila	Public	122
University of Wah, Wah	Private	123
Khyber Pakhtunkhwa, Central		
University of Peshawar, Peshawar	Public	222
Sarhad University of Information Technology, Peshawar	Private	152
Total		1120

Table 4: The population and Sampling details

Names of universities	Prof (N)	Prof (n)	Asso Prof (N)	Asso Prof (n)	Asst Pro (N)	Asst Prof (n)	Lec (N)	Lec (n)
Islamabad Region								
International Islamic University	30	10	31	10	74	25	98	35
Riphah International University	22	8	42	18	94	35	110	48
Northern Punjab								
University of Engineering and Technology, Taxila	8	5	13	6	41	16	60	25
University of Wah, Wah	9	6	21	12	44	17	49	29
Khyber Pakhtunkhwa								
Peshawar University	24	7	42	10	66	25	90	40
Sarhad University of Information Technology, Peshawar	10	5	15	8	40	15	87	35
Total	103	41	164	64	359	133	494	212

Population is N: 1120, whereas sample drawn is n: 450

Table 5: Pearson and Cronbach's alpha coefficients

Items No	Pearson correlations	Cronbach's alpha
01	0.327	0.833
02	0.312	0.833
03	0.295	0.835
04	0.340	0.832
05	0.298	0.835
06	0.210	0.838
07	0.256	0.836
08	0.292	0.835
09	0.605	0.817
10	0.617	0.815
11	0.592	0.817
12	0.624	0.815
13	0.594	0.818
14	0.598	0.817
15	0.613	0.816
16	0.444	0.827
	Σ 0.44	Σ 0.83

Table 6: Inter-scale correlation

	Disengagement	Exhaustion
Disengagement	01	
Exhaustion	0.45*	01

*Significant at 0.05

Table 7: Result of exploratory factor analysis (principal component analysis method)

Items	Factor loadings			
	Factor 01	Factor 02	Factor 03	Factor 04
01	0.920			
02	0.909			
03	0.882			
04	0.757			
05	0.574			
06		0.888		
07		0.883		
08		0.867		
09		0.789		
10			0.880	
11			0.869	
12			0.838	
13			0.797	
14				0.935
15				0.927
16				0.905

Kaiser-Meyer-Olkin test value: 0.84, Total eigenvalue: 4.98, Percentage (%) of variance explained: 31.14, Communalities ranged from 0.59 to 0.95

Table 8: Result of model fit

Models	X^2	df	X^2/df	RMR	CFI	GFI	RMSEA
One factor	0.6	01	0.6	0.022	1.00	0.87	0.014
Two factors	10.5	04	2.62	0.002	0.98	0.99	0.004

RMSA: Root mean square error of approximation, CFI: Comparative fit index, GFI: Goodness-of-fit index

by removing flawed items. In another study, Reis et al., (2015) observed the factor structure oldenburg burnout inventory across two groups, i.e. German employees and German students. They found that two factor structure demonstrated better fit, i.e., among both groups as compared to one factor. Moreover, they found that the concepts of exhaustion and disengagement were significantly correlated with each other in both samples. The findings of current study also concur with Campos et al. (2012), who tested oldenburg burnout inventory among Brazilian and Portuguese college students. Their results showed that two factor model demonstrated better fit, i.e., X^2/df: 4.6, CFI: 0.92, GFI=0.95 and RMSEA:0.05 among the Brazilian-Portuguese sample.

The review of results from the present study and studies conducted in the past has revealed certain facts regarding oldenburg burnout inventory. It is confirmed that Oldenburg burnout inventory

is a valid and reliable instrument for assessment of Burnout in different occupations in various cultures and settings. This instrument possesses good internal consistency, while the reliability coefficients for its sub scales of Exhaustion and Disengament ranges from $\alpha = 0.73$ to $\alpha = 0.85$, after its testing among different populations (Halbesleben, 2010; Timms, et al., 2012). The oldenburg burnout inventory gives good model fit with two factor structure as compared to one factor. It is because the items in inventory are both positively as well as negatively worded. Furthermore, the items of exhustion is different from disenagement in terms of its operationalization, therefore, combining both dimensions of exahustion and disenagement at the same time can result in a very poor fit (Demerouti, et al., 2003).

One other important fact about oldenburg burnout inventory is that it has been generally tested among service oriented professionals like teachers, health care workers and managers, because they are more frequently confronted with both physical and emotional demands (Demerouti and Bakker, 2008).

The current study has certain contributions. First, this study has tested oldenburg burnout inventory among a heterogeneous population with different strata. It helped in testing responses of a diverse population with distant characteristics. Second, this study has checked the econometric properties of oldenburg burnout inventory in Eastern culture as this inventory was previously developed and tested in western cultures. Third, the current study has determined both the reliability and validity of oldenburg burnout inventory at the same time.

5. LIMITATIONS AND FUTURE RECOMMENDATIONS

This study has certain limitations and recommendations for future research. It was a cross sectional study, therefore, its results cannot be generalized to different time periods, it is therefore suggested that future researchers should conduct longitudinal studies, so that any changes in result with regard to time can be traced out. The data collection process was limited to only selected universities, the future researchers can collect data from many universities within the country but also from universities across other nations. The current study used subjective data based on the individual perceptions of respondents. The future researchers can conduct experimental studies in a controlled environment. In this regard, Weijters et al. (2013) has already proposed various effects method, which need certain experimental manipulation during the data acquisition phase.

6. CONCLUSION

This study has provided sufficient evidence regarding the reliability and validity of oldenburg burnout inventory among university teachers. The detailed econometric analysis confirmed that oldenburg burnout inventory is a reliable and valid tool for measurement of burnout in academia of Pakistan, thus it could also be successfully used in different working sectors of Pakistan for the assessment of burnout. The findings of the current study are valuable additions into the existing body of knowledge and empirical research on the burnout inventories.

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