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Measuring the well-being of health care professionals in the Punjab: a psychometric evaluation of the Warwick-Edinburgh Mental Well-being Scale in a Pakistani population

Background: There is growing awareness of the public health importance of the mental well-being of population in general. This study was carried out to examine the wellbeing of Pakistani healthcare professionals, and to evaluate the psychometric properties of Warwick-Edinburgh Mental Well-being Scale in in this population. The well-being of health professionals is likely to influence their care delivery. **Methods:** A cross-sectional survey was carried out from June, 2013 to December, 2014 among 1271 Pakistani health personnel (HCPs) belonging to seven different cities of Punjab province, Pakistan, to examine the acceptability, internal consistency, test-retest reliability and the content and construct validity of the English version of the Warwick-Edinburgh Mental Well-being Scale in a Pakistani population sample. All data were analyzed in SPSS v.21. **Results:** Our analysis demonstrated a unidimensional construct, a high internal consistency (0.89) and test-retest reliability, good convergent validity and easy readability of WEMBS among Pakistani HCPs. The mean on WEMWBS score was 48.1 (9.4) which is lower than general population sample in other nations. Male healthcare professionals scored significantly higher on WEMWBS than their female counterparts ($P < .05$), and older respondents had higher scores. **Conclusion:** The WEMBS appears feasible and acceptable for use in the Pakistani healthcare professionals, and findings from this study indicate its validity and internal consistency. The well-being scores of the health professional respondents were lower than those identified in general population surveys in the UK.

1 **Measuring the well-being of health care professionals in the Punjab: a psychometric**
2 **evaluation of the Warwick-Edinburgh Mental Well-being Scale in a Pakistani population**

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Abstract**22 Background:**

23 There is growing awareness of the public health importance of the mental well-being of
24 population in general. This study was carried out to examine the wellbeing of Pakistani
25 healthcare professionals, and to evaluate the psychometric properties of Warwick-Edinburgh
26 Mental Well-being Scale in in this population. The well-being of health professionals is likely to
27 influence their care delivery.

28 Methods:

29 A cross-sectional survey was carried out from June, 2013 to December, 2014 among 1271
30 Pakistani health personnel (HCPs) belonging to seven different cities of Punjab province,
31 Pakistan, to examine the acceptability, internal consistency, test-retest reliability and the content
32 and construct validity of the English version of the Warwick-Edinburgh Mental Well-being Scale
33 in a Pakistani population sample. All data were analyzed in SPSS v.21.

34 Results:

35 Our analysis demonstrated a unidimensional construct, a high internal consistency (0.89) and
36 test-retest reliability, good convergent validity and easy readability of WEMBS among Pakistani
37 HCPs. The mean on WEMWBS score was 48.1 (9.4) which is lower than general population
38 sample in other nations. Male healthcare professionals scored significantly higher on WEMWBS
39 than their female counterparts ($P < .05$), and older respondents had higher scores.

40 Conclusion:

41 The WEMBS appears feasible and acceptable for use in the Pakistani healthcare professionals,
42 and findings from this study indicate its validity and internal consistency. The well-being scores
43 of the health professional respondents were lower than those identified in general population
44 surveys in the UK.

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46

47 **Introduction:**

48

49 Subjective or psychological well-being is increasingly recognized as a crucial aspect of overall
50 health that highlights the importance of *positive* mental health. It relates to the classic World
51 Health Organization (WHO) definition of health as more than just the absence of disease;
52 “Health is a state of complete physical, mental and social well-being and not merely the absence
53 of disease or infirmity” [1]. The importance of mental health within overall well-being is
54 emphasized in international policy as the 'foundation for well-being and effective functioning for
55 both the individual and the community' (which) allows individuals to realise their abilities, cope
56 with the normal stresses of life, work productively and fruitfully, and make a contribution to
57 their community.[2,3]

58

59 Subjective well-being has a long tradition as a key part of the conceptualisation of quality of life
60 [3] and its measurement has been embedded within this construct, with measures of quality of
61 life and of health related quality of life commonly incorporating questions concerning positive

62 and negative affect [4,5] as well as life satisfaction and considerations of fulfilment and purpose,
63 as for instance within the triennial European Quality of Life Survey [6].

64 However, over the past two decades, interest in measuring subjective well-being has expanded,
65 with the emergence of evidence that it can be measured in ways that are valid and reliable [3] ,
66 and here is now a widespread acknowledgement that focusing on the measurement of subjective
67 well-being is an essential part of measuring quality of life that merits particular measures and
68 approaches [7].

69
70 This focus on the positive elements of mental health and functioning is augmenting a previous
71 emphasis on deficits, problems and symptoms. This is evident within psychiatry research, mental
72 health policy and clinical practice [8] where the concepts of recovery and the increasing use of
73 wellbeing measures are increasingly commonly used [9]. Within broader public health and
74 policy it relates to an acknowledgment that promoting wellbeing and independence are essential
75 to preventing ill health, which is of particular relevance in light of the growing burden of
76 long-term conditions [10].

77
78 Within health services, there is a recognition that staff wellbeing is relevant to the quality and
79 safety of healthcare delivery [11] as well as to efforts and expenditure to recruit and retain
80 clinical staff [12]

81
82 The healthcare sector rates highly on important potential causes of work stress [13] with health
83 professionals (in particular nurses) among the occupations reporting the highest rates of work-
84 related stress, depression or anxiety (three-year averages) [14]. An extensive literature has

85 explored stress among health professionals, using measures of psychological distress as well as
86 more conceptually developed and specific tools such as burnout instruments [15]. Stressors that
87 may be evident within health professionals' work include working long and unsocial hours,
88 prolonged and cumulative involvement with seriously ill patients and their relatives, and
89 exposure to organisational conflicts. Even during their training, HCPs are exposed to a plethora
90 of academic, psychosocial and health-related stressors [16]. Medical students and junior doctors
91 have been reported to be at particular risk, but estimates of prevalence vary widely, from 18% to
92 82% [17].

93 Studies among healthcare professionals in Pakistan have reported a high prevalence of anxiety,
94 depression, high stress levels and burn-out, highlighting the need to address the issues of poor
95 job satisfaction, sleep deprivation due to shift patterns, patient overload, authoritarian work
96 relationships and limited peer and social support [18–20].

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100

101 In line with the growing emphasis on measures of positive health rather than a focus on deficits
102 and problems, it was considered useful to measure the subjective mental well-being of health
103 care professionals in Pakistan. The most widely known measure of mental wellbeing in the UK is
104 the Warwick Edinburgh Mental Well-being Scale (WEMWBS). WEMWBS is a measure of
105 mental wellbeing, developed by the Universities of Warwick and Edinburgh, and funded by NHS
106 Scotland.

107

108 The current study was devised to examine the psychometric characteristics of the WEMWBS
109 measure among English-speaking Pakistani health professionals. This is useful because there is a

110 paucity of psychological and psychiatric rating scales that have been cross-culturally validated
111 for use within Pakistan population [21], and the mental health scales that have been evaluated for
112 use in this population are largely measures of symptoms of mental disorder rather than of
113 positive mental health.

114 .

115

116 **Materials and methods:**

117 **Questionnaire and Instrument:**

118 The questionnaire consisted of two sections. The first section recorded information related to the
119 demographics and profession of the respondents, and the second section assessed mental well-
120 being levels with WEMWBS.

121 The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) was developed and extensively
122 validated in the UK general population [22]. It is a self-administered questionnaire and
123 comprises 14 positively worded items assessing eudaimonic (focused on psychological
124 functioning and a sense of meaning and purpose in life), and hedonic (focused on happiness,
125 contentment and life satisfaction) constructs of mental wellbeing. Responses are recorded on a 5
126 point Likert scale ranging from “none of the time” to “all the time”. For analysis, scores ranging
127 from 14-70 are obtained by summing all of the items. There is no reverse coding. The overall
128 score is the sum of all items, with higher scores indicating greater well-being, varying from 14
129 (low well-being) to 70 (high well-being).

130 Use in the UK, and in other nations [23] reveal the scale has good psychometric properties, and
131 is feasible, reliable, and sensitive to change. Chronbach’s α for the scale lies between 0.87 and

132 0.91 and the one-week test-retest reliability at $r = 0.83$. Validation studies have been undertaken
133 in different populations in the UK such as Scottish undergraduate and postgraduate students and
134 general population samples [22], English and Scottish teenagers [24], as well as Pakistani and
135 Chinese ethnic minorities in the UK [25]. It has also demonstrated high internal consistency,
136 good content, face validity, normal distribution and no floor and ceiling effects in previous
137 validation studies [22,24,25].

138

139 **Pilot Survey:**

140 A pilot study was conducted in which a convenience sample of 50 healthcare professionals
141 including doctors, nurses and dentists in the Combined Military Hospitals, Lahore, completed
142 and commented on the WEMWBS to assess if the original English language version WEMWBS
143 could be easily understood and completed. We received positive comments from the participants
144 that WEMBS was very easy to understand. Therefore, we did not feel the need to translate this
145 instrument to Urdu language.

146 **Sample size calculation:**

147 In general terms sample size calculation is based on variability in the sample and the size of
148 effects expected. Usually both of these are unknown before starting the study and figures are
149 estimated from previous studies or sometimes “rules of thumb” based on previous experience are
150 used. Most of the studies on validation of questionnaires in social sciences use 5-10 respondents
151 per questionnaire item for factor analyses. Factor analyses are subject to the strength of
152 communalities and factor loading and these statistical tests should instead be based on large
153 samples for reliable results [26]. Comrey and Lee recommend at least 500 cases and according to

154 their rating scale a sample size of 1000 or more is considered as excellent for factor analytic
155 studies [27]. Therefore, we aimed for a sample size of at least 1000 HCPs.

156 **Procedure:**

157 This cross-sectional survey was carried out from June, 2013 to December, 2014. The study
158 sample consisted of practicing doctors, nurses, physiotherapists, pharmacists and dentists
159 practicing either in hospital based or private settings in various cities of the province of Punjab,
160 Pakistan. Seven districts; Lahore, Faisalabad, Gujrat, Multan, Rawalpindi, Islamabad and
161 Sheikhpura were included in the survey for a study sample representative of the Punjabi
162 population. However, due to resources limitations, we could not conduct a systematic random
163 sample. Data were collected by convenience sampling approach. Sixteen medical students
164 (currently final year MBBS) approached HCPs in all available clinical settings in the Punjab
165 province. An independent sample of 50 HCPs from CMH Lahore participated in test-retest
166 assessment of WEMWBS and completed the questionnaire twice with a test-retest interval of 7
167 days.

168 Ethical approval was obtained from the Ethical Review committee of CMH Lahore Medical
169 College, Lahore Cantt, Pakistan. Written informed consent was provided by all the study
170 participants. The respondents were ensured anonymity and informed that only group level
171 findings would be reported.

172 **Statistical analysis:**

173 All data were analyzed in SPSS v. 21 (IBM Chicago, IL, USA). Frequencies and descriptive
174 statistics were calculated for demographic variables and total scores on WEMWBS. Histograms
175 and QQ-plots were visualized to assess the assumption of normality for WEMWBS scores and

176 floor and ceiling effects in the response distribution of WEMWBS. Factor analysis with principal
177 component analysis (PCA) and Quartimax rotation method was done to evaluate the construct of
178 WEMWBS. Prior to performing principal component analysis (PCA), its suitability was assessed
179 with following criteria: correlation coefficient > 0.3 for all variables, an overall Kaiser-Meyer-
180 Olkin (KMO) greater than 0.6 and a statistically significant Barlett's Test of Sphericity test ($P <$
181 $.05$). The number of components to retain were assessed with Cartell's scree plot, eigen values $>$
182 1, interpretability criterion, the amount of variance explained and reliability analysis.

183 Only those statements were included that had a factor loading > 0.3 . Cronbach's alpha
184 coefficient was calculated to assess the internal consistency of WEMWBS in our study sample
185 and a value of 0.70 - 0.9 was considered acceptable [28]. Item-total correlations were used to
186 assess the convergent validity of the questionnaire. Correlations were calculated using Pearson's
187 product moment correlation coefficient, and values that were substantial but not excessive
188 (greater than or equal to 0.2 and less than 0.8) were sought [28]. Test-retest reliability was
189 evaluated by the intra-class correlation coefficient using a two factor mixed effects model and
190 type consistency.

191 Floor and ceiling effects were assessed by examining response patterns for each of the factors
192 derived from factor analysis. Scores were graphed as a histogram and the distribution of scores
193 inspected; the percentage of individuals with the lowest and highest possible score in each of the
194 factors was recorded, and values greater than 20% were considered as floor and ceiling effects.

195 Association between participant characteristics and WEMWBS scores were examined with
196 independent sample t-tests. Although focus groups have been used to evaluate understanding and
197 meaning to participants [25] but in previous studies on WEMBWS, its readability had not been

198 assessed. Therefore, we used the Flesch Reading Ease score and Flesch-Kincaid Grade level
199 functions to assess the readability of the questionnaire [29].

200 **Results:**

201 **Response rate:**

202 Total response rate was 90.7% (1271/1400).

203

204 **Demographics:**

205 1271 individuals responded to the questionnaire. As noted in Table 1, participants' ages ranged
206 between 20 and 68 years, with mean age (SD) 31.8 (9.4). Male participants were older, 34.1
207 (10.3) than females, 30.0 (8.1). Most of the respondents were doctors (n=840, 66%) or nurses
208 (n=218, 17.2%), female (n=720, 57%), and practicing in Lahore (n= 70%).

209 There were some differences in respondent age and gender in relation to profession: nurses were
210 almost all (97%) female, whereas among doctors and dentists there was near equal gender
211 representation. 42 of the pharmacists were male (79%), as were 64% of the physiotherapists.

212 There were no significant age differences between the professional groups, except for the
213 dentists in the sample, who were younger than the other professions - mean age 28.5 (6.6);
214 $p < 0.001$)

215 Respondent characteristics are presented in Table 1.

216 **Descriptive Statistics and floor or ceiling effects:**

217

218 Mean (SD) and median scores on WEMBWS were 48.1 (9.4) and 48 respectively. The
219 assessment of item response frequencies from respondents showed little evidence of highly
220 skewed distributions: scores exhibited mild skewness of $-.31 (.07)$ and kurtosis of $.42 (.14)$.
221 Visual inspection of histogram and QQ plots did not reveal any significant deviation of response
222 distribution from normality. All response categories were used by at least one person for all the
223 scale items. Mean values for individual items ranged from 2.88 (1.1) for “I’ve had energy to
224 spare” to 3.74 (.99) for “I’ve been feeling confident” (Table 2). A histogram representing
225 distribution of mean scores of participants on WEMWBS is given in Figure 1.
226 Based on these results, it can be concluded that WEMWBS validated for Pakistani population is
227 free from any floor or ceiling effects.

228
229 As in the UK validation study (Tenant et al, 2007), mean WEMBWS scores were significantly
230 higher for men (49.16) than for women (47.30) ($t = 3.486$, $df = 1269$, $p = 0.001$) (See Table 1).
231 There were differences in well-being scores between the professional groups, with doctors’ and
232 nurses’ WEMWBS mean scores lower than those for the other professional groups. The
233 difference between WEMWBS for doctors and nurses combined, compared to the other
234 professional groups combined was statistically significant: $p = 0.002$ (mean difference = 2.22; $t =$
235 3.14 , $df = 1269$). A difference in wellbeing score was evident across age group, with participants
236 aged 30 years and older noting higher WEMWBS than the younger participants: ($p = 0.013$, mean
237 difference = 1.33, $t = 2.48$, $df = 1269$).

238 Items 2, 10, 11 and 12 were the most positively endorsed items by both male and female
239 respondents; whereas, items 3, 4 and 5 were least endorsed by the HCPs (both males and
240 females).

241

242

Factor analysis with Principal Component Analysis (PCA):

244 A principal components analysis (PCA) was run on WEBWS responses. Inspection of the
245 correlation matrix showed that all variables had at least one correlation coefficient greater than
246 0.3. The overall Kaiser-Meyer-Olkin (KMO) measure was 0.83 with individual KMO measures
247 all greater than 0.7, classifications of 'middling' to 'meritorious' according to Kaiser (1974).
248 Bartlett's Test of Sphericity was statistically significant ($p < .0005$), indicating that the data was
249 suitable for factor analysis. PCA revealed two components that had eigenvalues greater than one
250 and which explained 42.1%% and 8.5% of the total variance, respectively. Eigen values, visual
251 inspection of the Catell's scree plot, interpretability criterion and Cronbach's alpha value,
252 indicated that one component should be retained. A single-component solution explained 42.1%
253 of the total variance. Total score was obtained by summing all of the items. Factor loadings of
254 the rotated component solution for 14-item WEMWBS based on eigen values greater than 1 are
255 presented in Table 3. The Scree plot is given as Figure 2.

256 For interest of readers, exploratory factor analysis with principal axis factoring method have
257 been provided as a supplementary file Table S1.

Internal Consistency and content validity:

259 The WEMBS consists of 14 items. The Cronbach's alpha value obtained for one factor structure
260 of WEMBS was found to be .89. Corrected item correlations of all the items were greater than
261 0.3, thus, exhibiting the same construct of all the statements of WEMWBS. Item-total statistics
262 for all items of WEMWBS are given in Table 4. For further assessment of internal consistency,

263 item-total score correlations, adjusted for overlap, were calculated for each item and ranged
264 between 0.46 and 0.68, that is substantial but not excessive values The item-total statistics for all
265 items of WEMWBS are given in Table 4.

266 **Test-retest reliability:**

267 The test-retest reliability evaluated by intraclass correlation coefficient was .921 with a 95 %
268 confidence interval from .861-.955, thus, indicating a very high degree of reliability.

269 **Readability:**

270 The values for Flesch reading ease and FK grade level score were calculated on Microsoft Word
271 2013. Flesch reading ease score for 14-item WEMWBS and FK grade level score 73.5 and 4.4
272 respectively which indicates the easy readability and understanding level of WEMWBS.

274 **Discussion:**

275 The present study confirms one factor construct, a high internal consistency, convergent validity,
276 high readability of WEMWBS in the Pakistani population.

277 It also indicates no floor and ceiling effects exist in response distribution of WEMWBS for
278 Pakistani population. Our study sample was relatively large and consisted of a diverse range of
279 healthcare professionals -physicians, surgeons, general practitioners, nurses, pharmacists,
280 dentists and physiotherapists - which is an important strength of this study.

281 The mean (SD) well-being score of HCP respondents in this study was 48.1 (9.4), which is lower
282 than values obtained in general population surveys in the UK. The Health Survey for England
283 identified a mean WEMWBS score for adults of 52.3 [30]; whilst the mean score found in a

284 recent population survey for Scotland was 50.0 [31]. The median score was 48, compared to 51 in
285 the initial validation study [22] and 50 in a large-scale population sample in Northern Ireland
286 [32].

287 We also identified gender differences in well-being scores, as well as some differences between
288 professions and age groups. In this study, male HCPs scored higher on WEMWBS than females,
289 which is consistent with the findings of UK population studies [30,31]

290 Items 3, 4 and 5 were least endorsed by the HCPs in our study. According to Taggart et al
291 (2013), item 4 (I've been feeling interested in other people) was misinterpreted by Chinese and
292 Pakistani groups in the UK who took it in a sexual context [25], which might be a potential
293 reason for low positive response to this item in our study.

294 Similar to other studies conducted in the general population of the UK, our analysis has
295 confirmed the unidimensional construct of WEMWBS and a high internal consistency [22,24].
296 However, the factor structure was not as clear cut as in the original validation study [22] and
297 other analyses, with some suggestion of two factors; but the extent of cross-loading and the
298 modest additional variance explained by 2 factors/components, together with the lack of
299 explanatory or theoretical underpinning for this structure indicated that a unidimensional model
300 be retained.

301 A study conducted with Pakistani people in the UK also showed a high internal consistency, but,
302 as in the current study, the factor structure was less clear, with three factors evident, but the
303 limited variance explained by the second and third factors supporting a one-factor model. [25]

304
305 There was some correspondence between the item-total correlations identified in our study and
306 in the Taggart et al study of UK English-speaking Pakistanis. The three items with lowest item

307 total correlations in our study (item 1: ‘I’ve been feeling optimistic about the future’; item 4:
308 ‘I’ve been feeling interested in other people’; and item 5: ‘I’ve had energy to spare’) had lowest
309 correlations in the UK-Pakistani study, though the markedly low value for item found in the UK
310 sample (0.28) was not evident in our sample of Pakistani HCPs (.0.488). In focus groups
311 conducted as part of the UK study it was indicated that a quarter of Pakistanis completing the
312 questionnaire were Pashtun speaking and born abroad and there is no translation
313 for “optimistic” in the Pashto language [25]. However, our sample consisted of Punjabi and Urdu
314 speaking healthcare professionals.

315 The histogram was slightly negatively skewed and kurtotic, however, no floor and ceiling effects
316 were observed in WEMWBS in consonance with other validation studies. WEMWBS can also
317 prove useful for assessing mental wellbeing of undergraduates due to its easy readability and
318 lucid content as demonstrated by its values for Flesch reading ease and FK grade level score of
319 4.4. This fact was also supported by favorable comments from the participants in the pilot
320 survey. Based on this data, we can speculate that this scale can be easily used in teenagers,
321 college and university students as well.

322 **Limitations:**

323 This cross-sectional study used a convenience sample of HCPs and so, unlike a systematically
324 derived probability sample, the extent to which the respondents are representative of the target
325 population is uncertain. This is likely to be of lesser importance to the psychometric evaluation
326 than the descriptive results, and is partially compensated for by the relatively large sample size
327 and high response rate; 91% of those requested to complete the measure did so, which limits
328 participation and selection bias.

329 Comparator instruments were not used alongside WEMWBS to enable criterion validity
330 evaluation.

331 Translation and back-translation to develop an Urdu language version (the national language of
332 Pakistan) was not conducted as part of this study, because our sample consisted of HCPs who
333 were all capable of reading and writing in English language. So although the WEMWBS has
334 been shown suitable for assessing mental wellbeing in a diverse group of HCPs, it cannot yet be
335 used for studies within the general population of Pakistan, where the extent of fluency in English
336 is considerably less.

337 WEMWBS assesses hedonic and eudaimonic constructs of mental wellbeing but does not have
338 any items assessing spiritual and religious wellbeing of an individual which predominate in
339 Eastern traditions and culture of Pakistan where religious tendencies have emerged as an
340 important coping mechanism [33,34], emphasized in a study conducted in ethnic minority
341 groups of Malay, Chinese and Indian Muslims and Hindus [35]. Therefore, it is suggested that
342 new generation of psychometric instruments should include items assessing these constructs as
343 well.

344 **Recommendations:**

345 This scale is particularly useful in monitoring mental wellbeing levels of HCPs and medical
346 students working in a highly demanding roles and environments. Further studies are required to
347 develop and validate an Urdu version of this scale in the general community. Alongside general
348 investigations of the range of factors that are associated with mental health and well-being, the
349 WEMWBS may also have value in evaluating efficacy of stress reduction programs such as

350 mindfulness programs, relaxation exercises, cognitive therapies, and social support and group
351 therapies that have proven useful in academic and hospital based settings [36].

352 **Conclusion:**

353 According to our knowledge, this is the first study validating a scale for assessing mental
354 wellbeing in Pakistan and thus, it is an important addition to the limited arsenal of validated
355 psychometric instruments that exist for the Pakistani population. The WEMWBS has
356 demonstrated excellent psychometric properties in Pakistani HCPs and it appears a valid and
357 reliable tool for use among English-speaking Pakistani people.

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361

362

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Table 1 (on next page)

Demographic characteristics of HCPs participating in the survey (n=1271)

1 Table 1: Demographic characteristics of HCPs participating in the survey (n=1271)

Variable		Frequency (n)	WEMWBS Mean (SD)
Gender	Male	551 (43.4%)	49.16 (9.16)
	Female	720 (56.6%)	47.30 (9.59)
Healthcare Profession	Doctor	840 (66.1%)	47.74 (9.57)
	Nurse	218 (17.2%)	47.74 (9.45)
	Pharmacist	53 (4.2%)	50.28 (8.35)
	Physiotherapist	25 (2%)	49.44 (6.90)
	Dentist	135 (10.6%)	49.93 (9.26)
City	Lahore	893 (70.3%)	
	Multan	86 (6.8%)	
	Sheikhupura	54 (4.2%)	
	Gujrat	58 (4.6%)	
	Rawalpindi	101 (7.9%)	
	Faisalabad	54 (4.2%)	
	Islamabad	25 (2%)	
Age	>= 30	542 (42.6%)	48.87 (9.11)
	< 30	729 (57.4%)	47.54 (9.65)

2

Table 2 (on next page)

Item level statistics for WEMWBS for Pakistani HCPs (n = 1271)

2 **Table 2. Item level statistics for WEMWBS for Pakistani HCPs (n = 1271)**

Statement	Mean	Std. Deviation
I've been feeling optimistic about the future	3.36	1.109
I've been feeling useful	3.74	.991
I've been feeling relaxed	3.03	1.085
I've been feeling interested in other people	2.97	1.140
I've had energy to spare	2.88	1.113
I've been dealing with problems well	3.53	.959
I've been thinking clearly	3.59	1.034
I've been feeling good about myself	3.58	1.052
I've been feeling close to other people	3.33	1.053
I've been feeling confident	3.74	.999
I've been able to make up my own mind about things	3.72	.992
I've been feeling loved	3.64	1.038
I've been interested in new things	3.58	1.111
I've been feeling cheerful	3.42	1.022

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Table 3 (on next page)

Factor loadings for 14 item WEMWBS in Pakistani health personnel (n = 1271)

Table 3: Factor loadings for 14 item WEMWBS in Pakistani health personnel (n = 1271)

Statements	Factor Loading	
	I	II
I've been feeling confident (Item 10)	.789	
I've been feeling good about myself (Item 8)	.776	
I've been thinking clearly (Item 7)	.744	
I've been able to make up my own mind about things (Item 11)	.722	
I've been dealing with problems well (Item 6)	.703	
I've been feeling cheerful (Item 14)	.686	
I've been feeling close to other people (Item 9)	.670	
I've been feeling useful (Item 2)	.637	
I've been feeling loved (Item 12)	.625	
I've been interested in new things (Item 13)	.578	
I've been feeling optimistic about the future (Item 1)	.541	
I've been feeling interested in other people (Item 4)	.390	.663
I've had energy to spare (Item 5)	.378	.646
I've been feeling relaxed (Item 3)	.508	.528

Extraction Method: Principal Component Analysis.

Rotation Method: Quartimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

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Table 4 (on next page)

Item total statistics for 14-item WEMWBS (n = 1271)

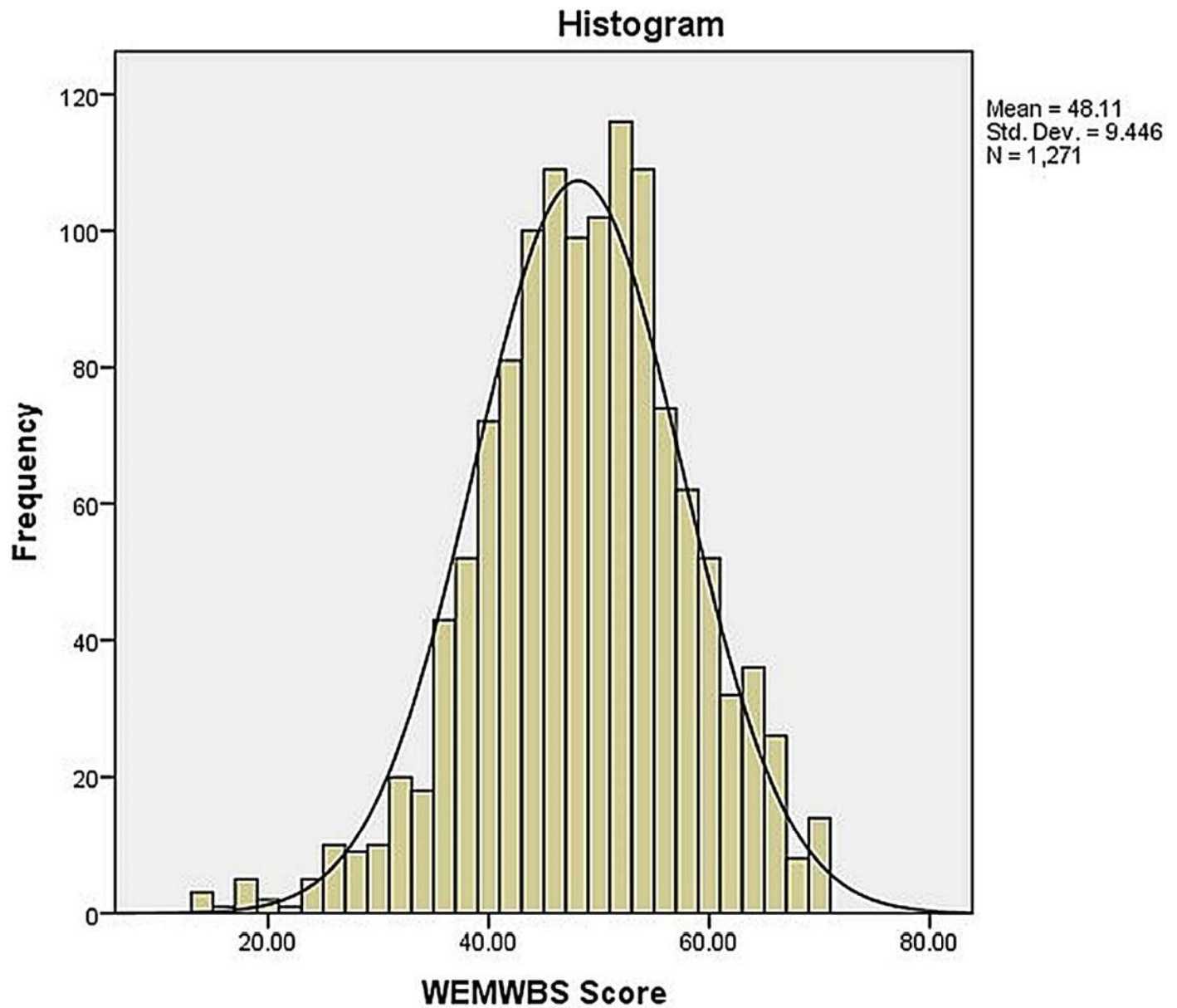
Table 4: Item total statistics for 14-item WEMWBS (n = 1271)

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I've been feeling optimistic about the future	44.75	78.422	.488	.293	.887
I've been feeling useful	44.37	78.627	.548	.350	.884
I've been feeling relaxed	45.08	77.650	.544	.355	.884
I've been feeling interested in other people	45.13	78.590	.462	.292	.888
I've had energy to spare	45.23	79.177	.445	.289	.889
I've been dealing with problems well	44.58	77.894	.616	.447	.881
I've been thinking clearly	44.52	76.722	.631	.490	.880
I've been feeling good about myself	44.53	75.597	.684	.525	.878
I've been feeling close to other people	44.78	76.788	.614	.424	.881
I've been feeling confident	44.37	76.938	.644	.518	.880
I've been able to make up my own mind about things	44.39	77.959	.587	.421	.882
I've been feeling loved	44.47	78.118	.547	.348	.884
I've been interested in new things	44.52	77.251	.550	.352	.884
I've been feeling cheerful	44.69	76.463	.656	.492	.879

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Frequency distribution of total scores of Pakistani HCPs on WEMWBS (n = 1271)



2

Scree plot for 14-item WEMWBS

