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ORIGINAL ARTICLE

Measuring mental well-being: A validation of the Short Warwick–Edinburgh Mental Well-Being Scale in Norwegian and Swedish

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Abstract

Aims: Mental health, currently one of the biggest challenges worldwide, requires attention and research. The aim of this study was to examine the psychometric properties of the Short Warwick–Edinburgh Mental Well-Being Scale (SWEMWBS), and validate the scale for use in Norway and Sweden. SWEMWBS, which includes both hedonic and eudemonic principles of mental well-being, could facilitate useful future studies. **Method:** Data were collected among Norwegian and Swedish hotel managers ($N=600$) through self-rated online questionnaires. Tests used to examine the psychometric properties of the scale included descriptive statistics, correlations, reliability analyses, and explorative factor analyses in SPSS, as well as confirmatory factor analyses in AMOS. Robustness tests were run for gender and country subsamples. **Results:** The scale showed adequate internal consistency and reliability. Results of the confirmatory factor analysis showed moderate fit in Norway and Sweden. In addition, the scale showed acceptable construct, criterion-related, and discriminant validity. **Conclusion:** The psychometric properties of the SWEMWBS were acceptable in both the Norwegian and the Swedish translations of the scale.

Key Words: Emotional intelligence, managers, mental health, mindfulness, Norway, positive and negative affect, SWEMWBS, Sweden, well-being

Introduction

The focus in this study is on the measurement of mental health, more specifically, the validation of the Short Warwick–Edinburgh Mental Well-Being Scale (SWEMWBS) [1]. Mental Disorders have increased worldwide in recent years [2]. The World Health Organization (WHO) [2] claims that mental health needs extensive attention and research, evidenced by the publication of the ‘World Health Organization’s Action Plan’ for Europe [2,3] and the ‘European Commission’s European Pact for Mental Health and Well-being’ [3]. Accordingly, governments around the world are recognizing the importance of improved mental well-being as an

indicator of progress in society, reflecting human capital and mental health promotion initiatives [26].

Mental health is a state of well-being in which individuals realize their own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and are able to contribute to their community [4]. The breadth of this definition is of interest; it includes both subjective well-being, and psychological and social functioning, which cover all aspects of life, including work-life [4–6]. The positive psychology literature emphasizes aspects of health and human beings that reflect both hedonic and eudemonic approaches to positive mental health [7].

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According to Stewart-Brown et al. [1], mental health research has been hindered, partly because of the lack of appropriate and accepted measures for both hedonic and eudemonic aspects of well-being. The SWEMWBS includes items that are worded positively, and focus on positive aspects of mental health and on the key attributes of mental well-being in the literature [5]. The scale has been found to be a reliable measurement for mental well-being with almost no floor or ceiling effects. The hedonic tradition embraces feeling good about life, focuses on happiness and defines well-being as enjoyment and pleasure attainment (e.g., positive affect) and pain avoidance (e.g., absence of negative affect) [8]. In contrast, the eudemonic tradition has its focus on human potential, meaning, and self-realization, and defines well-being in terms of the degree to which a person is fully functioning [10]. Both perspectives are considered significant for human growth and success [11]. This means that neither the hedonic nor the eudemonic perspective should be considered sufficient (alone) to carry the burden of a good work life [10].

Traditionally, one of the primary goals of occupational health research has been to determine the causal relationship between work and well-being [12]. Although most work-stress models (e.g., the demand-control-support model) have considered this relationship unidirectional, recent research has shown the importance of studying the reverse effects of work and well-being (e.g., how well-being affects the psychosocial work environment) [13,14].

Taking this research, together with the association between mental well-being and health and productivity, we argue that there is a need to develop short validated scales for use in the workplace in a health promotion perspective. This has not yet been sufficiently tested empirically. The aim of this study is therefore to validate the SWEMWBS. To the best of our knowledge, this is the first validation of this scale in a Scandinavian context.

Development of the Short Warwick-Edinburgh Mental Well-Being Scale

The original 14-item WEMWBS scale was developed by an expert panel based on current academic literature, qualitative research with focus groups, and psychometric testing [15]. The WEMWBS was developed as a one-factor scale and found to show good internal consistency ($\alpha = .90$). The WEMWBS scale has good face validity; it covers the majority of concepts associated with positive aspects of mental health, positive affect, satisfying interpersonal relationships and positive functioning

[1,6]. However, the large reliability coefficient may be evidence of item redundancy [1]. Consequently, Stewart-Brown et al. [1] modified the WEMWBS scale into the SWEMWBS. Using Rasch modeling, Stewart-Brown et al. [1] found that only seven of the original 14 items of the WEMWBS conform to Rasch model expectations and provide a valid raw score, interval level transformation with a correlation of 0.95 to the full scale. Furthermore, the SWEMWBS shows a strict unidimensionality and is largely free of item bias, with higher scores within an item reflecting greater overall mental well-being [1]. In terms of face validity, the seven-item SWEMWBS presents a more restricted view of mental well-being than the 14-item WEMWBS, with most items representing aspects of psychological and eudemonic well-being, and few covering hedonic well-being or affect. However, robust measurement properties combined with brevity make SWEMWBS preferable to WEMWBS at present for monitoring mental well-being in populations [1]. The scale is easily understood, accepted by the public as a measure of mental health, practical, and inexpensive enough to be included in large-scale health surveys [5].

Correlates of well-being as measures of validity

A fundamental psychometric characteristic of a scale is its construct validity [9]. Does the scale measure the construct for which it was devised? How does it correlate to other constructs? Construct validity is concerned with the theoretical relationships of a variable to other variables [9].

Criterion-related validity, also referred to as predictive validity, is concerned with the empirical association with some criterion, the most important aspect being the strength of the empirical relationship between the two measures [9]. Mindfulness, emotional intelligence (EI) and positive affect are all associated with greater well-being [16]. Brown and Ryan's [17] findings revealed that well-being measures, such as subjective and physical well-being, are moderately related to positive affect ($r = .39$ and above). Carmody and Baer [18] and Weinstein et al. [19] also reported a positive correlation between mindfulness and well-being ($r_s =$ from $.35$ to $.42$). In relation to EI, previous research has found that both trait and performance EI are associated positively with well-being ($r_s =$ from $.22$ to $.54$) [16,20]. This is in line with results from the validation of the WEMWBS scale [1] showing a positive correlation between mental well-being and EI ($r = .48$). Notably, higher levels of EI were associated with higher levels of positive affect. Several studies, including the

validation of WEMWBS, show a strong relationship between well-being and positive affect [16,20, 21]. Moreover, Schutte and Malouff [16] found that well-being mediated the relationship between EI and positive affect. The literature has explored the role of positive emotions in generating long-term resources such as well-being [22,23]. Happy people seem to experience a high quality of life in work, stronger personal relationships and better health, and effective coping and problem-solving [24,25]. In contrast, well-being correlates negatively with negative affect [1,16]. The ability to downregulate negative emotions seems therefore to be particularly relevant to mental health and well-being [26]. Based on previous literature and research linking well-being with similar constructs, we expect that scores on the SWEMWBS would show moderate positive correlations with measures of mindfulness, EI, and positive affect, and correlate negatively with negative affect. Empirical support for this proposition would provide evidence of criterion-related validity of the SWEMWBS.

Methodology

Participants

The current study was undertaken in late 2012, among employed General Managers (GMs: top leaders) and Managers (e.g., middle managers at a lower level) in a large hotel chain in Scandinavia (Norway and Sweden). Confidentiality and anonymity were guaranteed. The headquarters in Norway provided the leaders' email addresses. A self-reported questionnaire including an information letter was sent electronically (in both Norwegian and Swedish) to 848 participants (Norway: $n=491$, Sweden: $n=357$). Data were collected using an online survey solution provided by Quest Back; 600 leaders/managers responded, 354 in Norway and 246 in Sweden. The overall response rate was 71% (72% in Norway and 70% in Sweden), an acceptable response rate in both countries [27]. The mean age of respondents in Norway was 39.30 years ($SD= 8.65$). The mean age in Sweden was 40.5 years ($SD= 8.86$). Of the 354 Norwegian respondents, 155 were male (44%) and 199 female (56%), while in the Swedish sample ($n=246$), 91 (37%) were male and 155 (63%) were female respondents.

Measures

Mental well-being. Mental well-being was measured using the SWEMWBS [1]. The SWEMWBS comprises seven positively phrased Likert-style items. The items in the SWEMWBS were translated from English into both Norwegian and Swedish, and then

independently back-translated to ensure that the content and meaning remained unchanged (language equivalence) [28]. The first author and bilingual colleagues discussed the result in order to resolve any semantic inconsistencies prior to the survey. Consent was gained by personal communication from the developers of the original scale. Participants were instructed to consider their situation over the previous 2 weeks and indicate to what degree they agree with the statements. The scale represents a score for each item from 1 to 5, where 1 = none of the time, and 5 = all of the time. All items are scored positively, where a higher score indicates a higher level of mental well-being. Sample items include, 'I've been feeling optimistic about the future', 'I've been feeling close to other people, and 'I've been able to make up my own mind about things'.

In line with previous studies, we expected positive correlations between well-being and mindfulness, emotional intelligence and positive affect, and negative correlation between well-being, and well-being and negative affect. Such correlations would support the criterion-related validity of SWEMWBS.

Mindfulness. Mindfulness was assessed using a short version of the Mindful Attention Awareness Scale (MAAS) [17]. The MAAS is a five-item scale designed to assess the short-term or current expression of a core characteristic of mindfulness. Each item is scored from 1 to 5, where 1 = none of the time, and 5 = all of the time. The MAAS includes items such as, 'It seems I am "running on automatic" without much awareness of what I'm doing', 'I rush through activities without being really attentive to them' and 'I find myself doing things without paying attention'. The items on MAAS reflect lack of mindfulness: low score indicates high mindfulness; the items therefore need to be recoded.

Emotional Intelligence. EI was measured using the Wong and Law (2002) scale (WLEIS). The scale includes 16 items, and covers four facets of EI: (1) self emotions appraisal ($\alpha=0.87$), (2) regulation of emotions ($\alpha=0.83$), (3) use of emotions ($\alpha= 0.84$), and (4) appraisal of others emotions ($\alpha= 0.90$). Each item is scored using a scale from 1 to 5, where 1 = none of the time, and 5 = all of the time. The WLEIS scale includes items such as: 'I have good understanding of my own emotions' (SEA: self emotions appraisal), 'I am quite capable of controlling my own emotions' (ROE: regulation of emotions), 'I always tell myself that I am a competent person' (UOE: use of emotions), and 'I am sensitive to the feelings and emotions of others' (OEA: others' emotions appraisal).

Table I. Descriptive statistics, Cronbach's alpha and skewness for the two samples, and by gender split.

SWEMWBS	Norway (N = 354)		Sweden (N = 246)		Norway		Sweden	
					Male (n = 155)	Female (n = 199)	Male (n = 91)	Female (n = 155)
Mean	4.12	3.94	4.10	4.14	4.14	4.14	3.92	3.95
Median	4.14	4.00	4.14	4.14	4.00	4.00	4.00	4.00
SD	0.60	0.64	.61	.60	.66	.63	.66	.63
Range	3.14	2.86	2.43	3.14	2.71	2.86	2.71	2.86
Cronbach's alpha	.84	.86	.83	.86	.87	.87	.87	.87
Skewness	-.58	-.46	-.45	-.68	-.43	-.48	-.43	-.48
SE of Skewness	.13	.15	.19	.17	.25	.19	.25	.19

Positive and negative affect. The Positive and Negative Affect Schedule (PANAS) [29] was used in order to measure respondents' emotional affect. The PANAS consists of 20 items, whereof 10 items measure positive affect (positive affect: $\alpha=0.88$) (e.g., interested, excited, proud) and 10 items measure negative affect (negative affect: $\alpha=0.87$) (e.g., nervous, upset, worried). Using a five-point Likert scale, participants rated the degree to which each emotion was being experienced at work at the particular point in time (last 14 days).

As recommended by DeVellis [9]. Please check the citation], we also tested for discriminant validity, e.g., the absence of correlations between measures of unrelated measures. The measure expected not to correlate with managers' well-being was the number of rooms in the hotel they were managing.

Data analysis strategy

Data were collected using the software program Quest-Back, and no missing values were allowed. The design of this study allowed for validation of the SWEMWBS in two different languages, Norwegian and Swedish. Subsamples were also compared to the total dataset, in order to test robustness of the data and validity across subsamples. Descriptive statistics were conducted for both samples and by gender. The psychometric properties (including an examination of the dimensionality of the scale) were assessed using reliability analysis and explorative factor analysis. Analyses were conducted using the Statistical Package of Social Sciences (SPSS, version 20). The robustness of the factor structure of the SWEMWBS was tested using data from each sample (country) and by gender. Construct, criterion-related, and discriminant validity were assessed using correlational analyses in SPSS, and confirmatory factor analyses (CFA) using AMOS version 19.

Results

Descriptive statistics

Descriptive statistics, including mean values, median, standard deviations, range, and skewness of the well-being scale for all subsamples, are displayed

in Table I. The results in Table I show that mean scores for the Norwegian and Swedish samples on the SWEMWBS are comparable. While the data do not appear to be skewed, as evidenced by the skewness indices, the mean responses indicate a high level of reported well-being in both samples and by gender. The findings in Table I also show that the SWEMWBS is internally consistent, as evidenced by the acceptable Cronbach alpha coefficients.

Factor analysis

The SWEMWBS was constructed to assess aspects of mental well-being as a unitary construct. In order to evaluate the scale's unidimensionality, we conducted exploratory factor (EFA) analyses using principal components. Analyses were conducted by country, and robustness tests were run by country and gender. The results of these analyses are presented in Table II.

For both samples, the seven items in the SWEMWBS loaded comparatively high on one factor (factor 1), ranging from .64 to .78 (Norway), and from .67 to .82 (Sweden) (Table II). Exploratory Factor Analysis (EFA) and computing Principal Components Analysis (PCA), was used separately for each subscale, with the number of factors predefined by an eigenvalue ≥ 1.00 . The aim of EFA was to determine the latent structure of the particular datasets by discovering common factors (i.e., the latent variables). The eigenvalue was higher in the Swedish sample (3.9), and highest (in total) for men in Sweden (4.0). The explained variance for Factor 1 ranged from 52% to 57% (Table II).

The data in this study indicate only small differences among gender and country subsamples. All items showed desirable factor loadings and no items were deleted from the scale. Nevertheless, a few very small country and gender differences seem to exist. For example, 'I've been feeling relaxed' (item 3) seems to have the lowest loading among women in Norway (.63) (.64 in general in Norway). The factor loading for, 'I've been thinking clearly' has the highest overall loading, among women in Sweden (.84).

Table II. Factor loadings and explained variance for the SWEMWBS by all samples and gender.

SWEMWBS items	Norway (n=354)	Sweden (n=246)	Male Norway (n=155)	Female Norway (n=199)	Male Sweden (n=91)	Female Sweden (n=155)
I've been feeling optimistic about the future	.74	.67	.69	.79	.66	.68
I've been feeling useful	.74	.71	.70	.76	.65	.75
I've been feeling relaxed	.64	.72	.66	.63	.77	.69
I've been dealing with problems well	.77	.73	.71	.82	.79	.70
I've been thinking clearly	.78	.82	.78	.79	.79	.84
I've been feeling close to other people	.68	.78	.72	.68	.79	.78
I've been able to make up my own mind about things	.76	.78	.77	.75	.82	.75
Explained variance	53 %	56%	52%	56%	57%	55%

Extraction method: principal components.

Table III. Correlations of SWEMWBS with other constructs (Cronbach's alpha in parenthesis).

Scales	Norway	Sweden
Mindfulness	.27** (0.79)	.22* (0.81)
SEA (EI)	.40** (0.82)	.26** (0.81)
ROE (EI)	.32** (0.85)	.33** (0.85)
UOE (EI)	.36** (0.79)	.37** (0.78)
OEA (EI)	.33** (0.87)	.13* (0.79)
Positive affect (PANAS)	.47** (0.86)	.61** (0.89)
Negative affect (PANAS)	-.38** (0.87)	-.43** (0.88)

OEA, others' emotions appraisal; PANAS, Positive and Negative Affect Schedule; ROE, regulation of emotions; SEA, self emotions appraisal; UOE, use of emotions.

Emotional intelligence scale includes four dimensions: SEA, ROE, UOE, and OEA.

** Correlation is significant at the 0.01 level. *Correlation is significant at the 0.05 level.

Factorial validity

Confirmatory factor analyses consisting of seven items, with one latent variable, were conducted in each sample to examine whether mental well-being captured one distinct construct. Results from the Swedish sample showed a moderate goodness of fit: the normed chi-square value was 2.95, the root-mean-square error of approximation (RMSEA) was 0.089, adjusted goodness of fit (AGFI) was .912, and the comparative fit index (CFI) was 0.96. Items all significantly loaded on one latent factor, coefficients ranged from .75 to 1.24 (item 2 is the lowest at .75).

Results based on the Norwegian sample also showed a moderate goodness of fit of the unidimensional model: normed chi-square = 4.10, RMSEA = 0.094, AGFI = .917, CFI = .967. These indices were for a final model in which some error terms were correlated based on modification indices. The results showed that the one-factor models all significantly

loaded on their latent factor, in which coefficients ranged from 1.00 to 1.25.

Criterion-related validity

Criterion-related validity was assessed by correlating well-being with mindfulness, emotional intelligence, and positive affect (see Table III). Weak to strong positive correlations were found between well-being and these personal factors ($r = .13-.61$). Thus, respondents who reported high well-being also reported significantly higher levels of mindfulness, emotional intelligence, and positive affect. The relationships between well-being and the personal factors differed between Norway and Sweden; however, these differences are relatively small. The correlation between well-being and mindfulness was stronger in Norway ($r = .27$) than in Sweden ($r = .22$). For emotional intelligence, moderate significant relationships were found for all subscales: Self emotions appraisal (SEA), Regulation of emotions (ROE), Use of emotions (UOE), and Others emotions appraisal (OEA). Positive affect also showed moderate ($r = .47$) to strong ($r = .61$) correlations in Norway and Sweden, respectively.

Significant moderate negative correlations were found between well-being and negative affect ($r = -.38$, in Norway, $r = -.43$, in Sweden). Respondents who reported high negative affect also reported significantly lower levels of well-being. All the expected correlations were significant and in the directions that were set *a priori*, indicating that the SWEMWBS has demonstrated criterion-related validity in the Norwegian and Swedish samples.

Testing for discriminant validity, there was no correlation between well-being and number of rooms in the hotel the manager was managing; the result was ($r=.02$), as expected.

Discussion and conclusion

An aim of this study was to examine the psychometric properties of the SWEMWBS. Factor analyses showed that SWEMWBS items loaded on one factor, explaining 52–57% of the variance. Our findings supporting a unidimensional structure are also in line with previous theoretical assumption behind the development of the SWEMWBS [1,6]. In addition, we found that mental well-being was positively related to mindfulness, EI and positive affect, and negatively related to negative affect. This finding is in accordance with previous literature on mental well-being, and provides further evidence of the criterion-related validity of the SWEMWBS. The results of CFA showed the unidimensional factor structure was an adequate model fit to the data. Moreover, the CFA results from this study build on previous validation conducted in other countries using the WEMWBS scale [5].

This study has both strengths and limitations. The study utilized relatively large samples from two countries, with high response rates, and no missing responses. In addition, the findings are based on robust methodologies in relation to the translation of the SWEMWBS. The organization studied, however, is known for recruiting members high on positive affectivity; hence the study population may be skewed, not representative for all leaders globally. Future studies should therefore aim at samples that are more representative. The study was conducted in a Scandinavian organizational context known for a relatively high level of subjective well-being [30]. Surveys conducted to measure ‘the happiest country’ have consistently ranked Norway and Sweden in the top 10 (e.g., OECD Life Satisfaction survey list 2012). We therefore recommend that the study should be replicated in other countries to test whether the findings can be generalized. Finally, the moderators (baseline variables of age, gender and occupational type) of mental well-being and its long-term effects on workers in Scandinavian countries should be further investigated. Not only should future studies focus on well-being as an outcome, but future studies should also account for potential reversed effects; that is, how worker health and well-being affects the work environment [12,13]. There is need for more longitudinal studies in order to understand fully the reversed mechanisms of mental health on work, as described by de Lange et al. [14].

In a public health perspective, the validation study shows that the SWEMWBS is a useful, valid and reliable questionnaire for measuring mental well-being. In conclusion, this study provides evidence for the criterion-related validity of the SWEMWBS

scale in a Norwegian and Swedish context. The SWEMWBS seems to be a satisfactory instrument for measuring mental well-being among Norwegian and Swedish leaders according to the following four criteria: (a) acceptable reliability, as measured by Cronbach’s alpha coefficient, (b) having a one-factor solution with high factor loadings and high explained variance, (c) showing acceptable criterion-related validity when applying mindfulness, emotional intelligence, and positive and negative affect, and (d) robustness across subsamples by country and gender. Robustness tests run for gender suggest that the scale is gender neutral. The SWEMWBS has satisfactory psychometric properties, as the results are in line with those available from the original studies and translations into other languages. Nevertheless, the SWEMWBS is shorter than WEMWBS, and the respondent burden is lower (e.g., less time consuming). It is notable that SWEMWBS was created from statistics, rather than only from a theoretical perspective on mental well-being. We will thus conclude that the Norwegian and Swedish versions of SWEMWBS seem to be appropriate for evaluating mental well-being among Norwegian and Swedish people.

The advantage of SWEMWBS’ unidimensional scaling properties is great, not only to monitor health and mental well-being in the general population, but also to be confident in the statistical assessment of the significance of differences attributed to interventions [5].

Conflict of interest

None declared.

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