An assessment of the emotional intelligence of health workers

A scale validation approach

Nestor Asiamah
Department of Research, Africa Center for Epidemiology, Accra, Ghana

Henry Kofi Mensah
Department of Human Resource and Organizational Development, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana, and

Emelia Danquah
Koforidua Technical University, Koforidua, Ghana

Received 5 March 2017
Accepted 30 January 2018

Abstract

Purpose – This study aims to assess health workers' level of emotional intelligence (EI) in Accra North and recommend a simple but robust statistical technique for compulsorily validating EI measurement scales.

Design/methodology/approach – The researchers used a self-reported questionnaire to collect data from 1,049 randomly selected health workers. Two non-nested models, BNK MODEL and CMODEL, were compared to see which of them better fits the study population and yields a better level of EI. The one-sample and independent-samples *t*-tests, exploratory factor analysis and confirmatory factor analysis were used to present results.

Findings – The study found that health workers were appreciably emotionally intelligent for both models at the 5 per cent significance level. However, EI was higher for the CMODEL. The CMODEL also better fits the study population ($\chi^2 = 132.2$, $p = 0.487$, Akaike information criterion = 124.932) and thus better underlies EI in it. This study recommends proper validation of the two EI scales evaluated in this study, and possibly other scales, before the use of their data in research, as failure to do so could lead to unrealistic results.

Originality/value – Apart from its contribution to the literature, this study provides a robust statistical approach for assessing health workers' EI and validating EI scales. By comparing two models of EI in the validation process, this paper suggests that the researcher's choice of a measurement scale can influence his/her results.

Keywords Emotional intelligence, Confirmatory factor analysis, Exploratory factor analysis, Scale validation, EI assessment

Paper type Research paper

Introduction

What is today referred to as *emotional intelligence (EI)* owes its origin to efforts made by several writers and researchers (Gardner, 1983; Bar-On and Parker, 2000) to find a replacement for intelligent quotient and social intelligence, which fail to fully explain and characterize humans' cognitive ability (Freshman and Rubino, 2002). When they first coined EI, Salovey and Mayer (1989) conceptualized it to embody four skills:

(1) the accurate perception, appraisal and expression of people's motions;

Journal of Global Responsibility

2041-2568
DOI 10.1108/JGR-03-2017-0014

(2) generating feelings on demand when they can facilitate an understanding of self or persons;

(3) understanding emotions and the knowledge that can be derived from them; and

(4) regulation and control of emotion to promote emotional and intellectual growth.

Knowledge of these four skills influenced modern research on EI and constituted the foundation of the research work of Goleman (1995), who popularized the concept of EI among academics (Bowen *et al.*, 2016). According to Freshman and Rubino (2002), the Consortium for Research on Emotional Intelligence in Organizations defined EI as "[. . .] social and emotional abilities that previous research has shown to be linked to successful performance in the workplace".

EI researchers have over the years shared and nurtured a common agenda, which has to do with conceptualizing EI as a predictor of several performance indicators (e.g. job performance, employee satisfaction, service quality, firm performance) and confirming its positive effect on these indicators. For example, Shahhosseini *et al.* (2012) are among the many researchers who conceptualized the positive linkage between EI and job performance. Many other researchers (Danquah and Wireko, 2014; Opuni *et al.*, 2014) have also empirically confirmed the positive effect of EI on job performance, job satisfaction, service quality delivery and customer satisfaction.

Though not all studies have confirmed the positive effect of EI on the said performance indicators (Farooq and ur Rehman, 2011), majority of them have. As a result, proponents of the EI concept such as Freshman and Rubino (2002) have almost coaxed the academic community into accepting the relevance of EI to service delivery and performance in the healthcare sector. Nonetheless, the foregoing academic debate on EI and its impact on healthcare delivery, and other performance indicators, is inconclusive in view of some issues identified in the literature. After drawing lessons from the systematic review of Farooq and ur Rehman (2011), the researchers realized that one of these issues is the failure of researchers to acknowledge implications of their choice of measurement scale for their research findings, given that EI has several different scales (Freshman and Rubino, 2002). A more critical issue, for which this study is carried out, is the disclosure of Farooq and ur Rehman (2011) that research on EI and its effect on some performance variables is lacking in many multicultural jurisdictions across the world. This situation is deemed a major problem in the literature owing to the culture-sensitive nature of EI (Goleman, 1995; Mayer, 2008; Danquah and Wireko, 2014). As a result of the culture-sensitive nature of EI, its level and effect on performance variables are bound to change across cultures and jurisdictions. For this reason, adequate research is needed in major sectors in every country with a unique culture to substantially validate EI as a performance-boosting ability. In many jurisdictions such as Ghana however, the paucity of EI studies in some sectors such as health care is alarming (Farooq and ur Rehman, 2011). More specifically, studies dedicated to the assessment of the EI level of health workers in Ghana are rare (Danquah and Wireko, 2014; Opuni *et al.*, 2014). As a consequence, empirical evidence on whether health workers are emotionally intelligent in Ghana is too scant.

To reach credible findings in a quantitative study, the application of a valid and reliable measurement scale is necessary. A researcher is therefore expected to ensure that a measurement scale is validated properly using the best statistical procedures before analyzing its data. The researchers observed that the few empirical studies (Danquah and Wireko, 2014; Opuni *et al.*, 2014) carried out on EI in Ghana and a majority of studies conducted in other parts of the world adopted standard scales like the 33-item scale of Schutte *et al.* (1998) in measuring EI. These studies, however, did not apply sufficiently

rigorous statistical procedures to validate their scales, though many researchers (Schutte *et al.*, 1998; Petrides and Furnham, 2000) have expressed the need for EI scales to be validated in quantitative studies owing to their multi-dimensional nature and the fact that research participants can "fake good" in responding to them. In this paper therefore, the EI of health workers is assessed. This study also demonstrates how a simple but robust statistical technique can be used to validate any EI scale. In the validation process, two models are compared in an attempt to show that the result of a scale validation and consequently an entire study can differ for different scales. This comparative analysis thus stresses the importance of scale validation and the need for researchers to be more careful in choosing an EI measurement scale.

Literature review

Models of emotional intelligence

Goleman (1995) is one of the several researchers who were attracted to the earlier work of Bar-On (1997) and Salovey and Meyer (1989), resulting in his re-conceptualization of EI as a cognitive ability of five dimensions. The popularity of EI is ascribed to his five-dimensional EI concept for a couple of reasons. First, Goleman's (1995) concept is represented by a framework that more comprehensively explains the four EI competencies earlier defined by Salovey and Mayer (1989). Second, his work decomposes EI into five empirically validated dimensions and serves as the embodiment of the mixed EI model, the most holistic conceptualization of EI (Freshman and Rubino, 2002).

The mixed model is one of the three EI frameworks, with the other two being the *ability model* and *trait model* (Mayer, 2008; Opuni *et al.*, 2014). The ability model considers emotions of self and others as useful sources of information that help one to make sense of the social environment and navigate it (Goleman, 1998). It asserts that individuals are different with respect to their ability to process emotion-driven information, and in their capacity to relate emotional processing to a wider level of cognition. This model is entirely explained by the four EI competencies of Salovey and Mayer (1989), which have been identified earlier in this paper. The second model, the trait model, refers to an individual's self-perceptions of their emotional abilities (Freshman and Rubino, 2002; Mayer, 2008). This model of EI encompasses behavioral dispositions and self-perceived abilities of the individual. It is often measured using self-reported questionnaires, as opposed to the ability model that uses actual abilities.

The mixed model presents EI as a framework of five skills and competencies that enforce effective everyday and leadership behavior (Goleman, 1998). These competencies, which were developed by Goleman (1995) based on the framework of Salovey and Meyer (1989), are *self-awareness, self-regulation, social skill, social awareness* and *self-motivation*. Goleman (1995) views these competencies as learned capabilities that can be improved over time, and are therefore not innate talents, though he posits that individuals are born with a general EI that determines their potential for learning and building emotional competencies.

Self-awareness is having sufficiently deep understanding of one's emotions, strengths, weaknesses, needs and drives (Goleman, 1998; Özer *et al.*, 2016). This understanding is fundamental to deciphering the psychological and emotional conditions of others. *Self-regulation* is the capacity to adapt to changes and situations, including the ability to say no to impulsive urges (Goleman, 1995; Kernbach and Schutte, 2005). It is generally perceived as an EI skill relevant to coping with or managing the odds of other peoples' behaviors. The third skill, *self-motivation*, is the ability to dare to achieve, being passionate over profession and work and enjoying challenges and outcomes (Goleman, 1998; Bowen *et al.*, 2016). A self-motivated health worker will therefore thrive on his or her job no matter the challenges

faced. *Social awareness* is the ability to thoughtfully consider others' feelings when interacting or when relating with them (Goleman, 1995; Özer *et al.*, 2016). People with ample social awareness are not hasty in dissenting people's dispositions but rather take time to understand the basis of such dispositions and take empathetic actions in a manner that engenders happiness for themselves and those they are interacting with. The final ability of the mixed model is *social skill*, which is the ability to move people in a desired direction (Goleman, 1995; Freshman and Rubino, 2002). People with this ability are capable of influencing others to take decisions that harmonize with their desire and goal.

The multiplicity of EI models/theories and scales

Goleman's (1995) EI theory primarily explains EI in terms of the five skills of the mixed model, and assumes that EI is malleable and can therefore be improved from time to time. It also asserts that as a cognitive skill, EI is required in building fruitful human relations in several instances but with particular emphasis on leadership. Bar-On's (1997) framework is another competing EI theory, which constitutes the foundation of the emotional quotient inventory (EQ-i) originally developed to assess various aspects of EI and its conceptualization. Bar-On (1997) views EI as a set of interrelated emotional and social competencies that determine how effectively people understand and express themselves, understand others and relate with them and cope with the demands of daily life. Obviously the EI theories of Bar-On (1997), Salovey and Mayer (1989) and Goleman (1995, 1998) explain the same concept in different contexts. Hence, these and other theories of EI can be said to produce common understandings.

Nonetheless, one of the major issues associated with the concept of EI is the variety of its theories or models, resulting in seemingly tautological explanations of its concept (Bowen *et al.*, 2016). Worse yet, each theory, particularly those of Salovey and Mayer (1989), Goleman (1995) and Bar-On (1997), accompanies one or more measurement scales, thereby making it difficult for researchers to choose an appropriate one. Goleman (1995, 1998) alone has two models developed in two different contexts acknowledged earlier, whereas other models are associated with between three and five dimensions (Nwankwo *et al.*, 2013).

In essence, the EI concept has been associated with myriad of models and their corresponding scales. Although this situation is often considered a problem for researchers, Petrides and Furnham (2000) explained that all EI scales are multidimensional and have the tendency of producing different numbers of dimensions in different studies. They further attributed this characteristic of the EI construct to the variety of its theories, its sensitivity to cultural changes across populations and the fact that it is susceptible to "faking good" by respondents. The fact that previous validations of mixed EI scales, including the scales of Schutte *et al.* (1998) and Goleman (1998), were associated with different populations and yielded different factor structures lends support to the much-mentioned volatility of EI scales. Schutte *et al.* (1998) therefore took a noble course when they recommended that every EI scale should be validated in a study before applying its data. Researchers are also expected to understand the context in which a scale was developed and the theory that governed its development before adopting it (Petrides and Furnham, 2000). This understanding must be coupled with knowledge about whether the scale addresses the current research context and objectives. The scale of Schutte *et al.* (1998), for instance, was developed from the perspective of the EI theory of Goleman (1995) and constitutes all five dimensions of the mixed model discussed earlier. Any researcher who intends to assess EI fully must therefore use it or any complete mixed model, such as the four-factor model of Goleman (1998). On the other hand, any researcher who intends to assess only ability EI can apply the Mayer–Salovey–Caruso Emotional Intelligence Test or a scale specialized for this

type of EI. Making the right choice of a measurement scale is consequently a precursor to proper scale validation in EI research.

Validation of a measurement scale

A recommendation by experts (Schutte *et al.*, 1998; Petrides and Furnham, 2000) that has been undermined by many researchers is the need to validate a measurement scale before applying its data in a study. A perusal of most EI studies would reveal that scales adopted are either not validated or poorly validated in a fashion of reporting just the reliability statistics reached. Yet, the validation of a research scale is done using robust statistical tools such as exploratory and confirmatory factor analyses (EFA and CFA; Hurley *et al.*, 1997; Ringner, 2008), and the outcomes of the validation process must be well documented and communicated (Tipping and Bishop, 1999; Ringner, 2008). The researchers contend that failure of many researchers to validate their EI scales or communicate outcomes of the scale validation process discredits empirical evidence on the effect of EI on performance indicators.

A more critical problem is failure of most researchers (Nwankwo *et al.*, 2013; Kaur *et al.*, 2015) to provide comprehensive evidence about the EI level of their research subjects using appropriate statistical tools (e.g. EFA and CFA). For example, in the study of Alnidawy (2015), a "big" effect of EI on job satisfaction is confirmed, but no evidence is provided on the EI level of the participants, neither is any documentation and communication of the validation of the EI measurement scale made. Nwankwo *et al.* (2013) similarly confirmed a strong positive effect of EI on job satisfaction without reporting the level of EI associated with their population. Moreover, in their quest to assess and validate EI as a basic skill needed by nurses, Bakr and Safaan (2012) only computed mean scores and correlation coefficients, without validating their scale as a more thorough way of assessing nurses' EI and as a necessary requirement for reaching statistically valid findings. Evidently, these and many researchers were preoccupied with the sole goal of detecting the effect of EI or communicating findings of their interest. It is argued by the researchers in this paper that "big" and significant effects without a thorough scale validation foundation are not as good as insignificant effects rooted in rigorous validation of the measurement scale.

In this study, researchers reason that measurement scales, whether standard or not, must be validated properly before applying its data, as these scales can yield different results across geographical areas and populations. It is also opined by the researchers that scale validation can be used to better understand the real-life conditions of a variable in a population or sample, enabling the researcher to better understand confirmed or unconfirmed effects and their implications. As EI is a relatively new concept and is culture-sensitive (Danquah and Wireko, 2014; Shahhosseini *et al.*, 2012), its scales must always be validated before using their data, and such a validation process can be used as a means of examining participants' EI levels. Arguably, results of scale validation must be communicated in peer-reviewed papers, at least in a simple way, without which the integrity of research outcomes cannot be verified.

Failure to validate a measurement scale has two implications. First, some irrelevant indicator variables may be incorporated in the construct, and this can lead to an underestimated effect size, as irrelevant items technically have relatively low extraction or communality values (i.e. with respect to EFA) and therefore hinder the role of relevant indicators. Second, without scale validation, data of each construct include unwanted items that lead to misleading results (Schutte *et al.*, 1998; Tipping and Bishop, 1999). Undoubtedly, studies with misleading results dent the image of the academic literature and question its reputation.

Various statistical techniques have been used in the literature to validate measurement scales. One quick-and-dirty technique is the computation of Cronbach's alpha (CA; i.e. reliability coefficient) for the whole scale or two or more components of the scale's items (Tipping and Bishop, 1999; Allwood, 2012). There are theoretical and non-theoretical aspects of this approach. The theoretical aspect is the computation of reliability coefficients for various components of the scale based on some theory, as done in the study of Schutte *et al.* (1998). An example of this approach is computing reliability coefficients for each of the five dimensions of Goleman's (1995) mixed model. A non-theoretical way is to split the scale into two or more parts and compute reliability coefficients for each half. A Cronbach alpha of the whole scale or a split should be 0.7 or greater for reliability to be confirmed (Morse, 2002; Drost, 2011). Yet, as reliability coefficients do not reveal several issues with the scale and do not imply the absence of irrelevant items in it, their computation as the sole way of validating a measurement scale is not good enough.

The most robust scale validation process involves the use of EFA and CFA (Petrides and Furnham, 2000; Kelava, 2016), with descriptive statistics, and CA computed as preliminary statistics that support evidence reached in the process (Hurley *et al.*, 1997). The use of EFA and CFA jointly yields the best results owing to the following outcomes (Kelava, 2016):

- statistical baselines are used to eliminate unwanted or irrelevant variables or to retain all items;
- irrelevant variables can be spotted and removed before confirming the fit of the scale according to a theory; and
- even if the elimination of irrelevant variables is skipped at the preliminary stage where descriptive statistics and EFA are applied, CFA can rectify the oversight.

The credibility of using EFA and CFA can be confirmed in a number of novel papers (Hurley *et al.*, 1997; Schutte *et al.*, 1998; Petrides and Furnham, 2000; Kelava, 2016). This study therefore adopts the EFA and CFA to validate the EI scale, and the researchers used them as pivotal elements of the approach demonstrated in this study.

The validation of a measurement scale using CFA better makes sense when the structure of the scale is theory-driven (Schutte *et al.*, 1998). In other words, the validation of EI using CFA should be guided by a known theory and a suitable scale. Considering the fact that they accompany scales that completely measure EI, Goleman's (1995, 1998) EI models are applicable as the theoretical foundation for assessing and validating health workers' EI. The applicability of these theories is also supported by the fact that they are conceptually consistent with the initial EI theories of Salovey and Mayer (1989) and Bar-On (1988). This study therefore adopts Schutte *et al.*'s (1998) scale [which was developed based on Goleman's (1995) model] and the four-factor scale of Goleman (1998).

For an EI scale to be completely validated, each of its indicators must be significantly related to its underlying theoretical latent construct (Petrides and Furnham, 2000) after producing a communality value of not less than 0.5 in EFA (Tipping and Bishop, 1999; Ringner, 2008). Moreover, the reliability coefficient of each theoretical dimension or any dimension extracted from the scale must be 0.7 or greater (Morse, 2002; Drost, 2011), and the correlation between most pairs of the indicators should be statistically significant (Tipping and Bishop, 1999; Ringner, 2008). Based on the argument of Tipping and Bishop (1999), any indicator which fails to yield a communality value of at least 0.5 is eliminated from the scale through an iterative EFA. Such indicators are thus not taken into the CFA stage. The elimination of indicators in EFA, if necessary, is part of the scale validation process and counts toward establishing adequate internal consistency of the scale before using CFA.

Scale validation also includes the computation of the composite reliability (CR), average variance estimate (AVE), maximum shared squared variance (MSV) and average shared squared variance (ASV) (Hurley *et al.*, 1997), and making sure that these statistics are equal to or greater than some standard statistical baselines (Hurley *et al.*, 1997; Ringner, 2008). More specifically, these statistics more robustly confirm reliability and validity based on the following criteria recommended (Hurley *et al.*, 1997; Petrides and Furnham, 2000; Kelava, 2016):

- reliability – CA/CR > 0.7; communality > 0.5;
- convergent validity – CR > AVE, AVE > 0.5; and
- discriminant validity – MSV < AVE, ASV < AVE.

A validation process leads to either the retention of all items of the scale or an elimination of some of its items (i.e. those not significantly related to their underlying latent construct). An implication of item elimination is the fact that theoretical dimensions can be lost. On the basis of the above discussion, the said statistical approach demonstrated in this study largely constitutes EFA and CFA, though descriptive statistics and the independent-samples *t*-test are used as supporting statistics.

Methods and materials

Several novel studies (Schutte *et al.*, 1998; Petrides and Furnham, 2000) have used the quantitative research technique to assess a measurement scale similar to the EI scales examined in this study and to assess workers' EI. Hurley *et al.* (1997) have also reasoned that any study aimed at assessing or validating a measurement scale using EFA and CFA is better carried out as a quantitative research. This study therefore used the quantitative research technique. In addition, this study examines health workers' EI by comparing two non-nested models for reasons already mentioned.

This study's general population was healthcare personnel working in all healthcare institutions under the supervision of Ghana Health Service (GHS) in Accra North. This population includes administrative, paramedical and medical staff. Security personnel, cleaners, gardeners and administrative workers who did not make direct influence on health care within the chosen institutions were not included in the study. The total number of healthcare institutions in the study area was ten, and a total of 1,773 personnel made up the accessible population of healthcare professionals serving in these institutions. Table I shows

Hospital name	Population size (*N*)	Sample size (n)
Ridge Hospital	345	181
37 Military Hospital	267	159
Iran Clinic	133	97
Mamobi Polyclinic	123	92
Adabraka Polyclinic	132	97
Cocoa Clinic	104	80
Holy Trinity Hospital	243	148
Kaneshie Polyclinic	178	123
Achimota Hospital	156	113
Total Clinic	92	73
Total	*1,773.00*	*1,163.00*

Table I. Population and sample sizes of the study

the various participating health institutions and their respective population and sample sizes.

A representative sample of 1,163 personnel was drawn from the accessible population using the simple ransom sampling method. The sample size determination table of Krejcie and Morgan (1970) was used to determine a representative sample size for each institution based on a hospital's accessible population size. In sampling, each personnel in an institution was labeled with a numeric code. Codes for personnel in each institution were separately simulated in MS Excel 2013 and transported to SPSS version 21, where the random sampling procedure was activated and used to select participants who constituted each hospital's sample. In a nutshell, 1,163 health workers participated in this study. To set the basis for comparing two models, EI was measured using two self-reported scales, namely, Schutte *et al.'s* (1998) scale and Goleman's (1998) scale. These scales are further described as follows:

- The mixed EI scale of Schutte *et al.* (1998): This scale was used to collect data for the primary model, hereby called the *benchmark model* (i.e. BNK-MODEL). It is made up of the five dimensions of Goleman's (1995) mixed model and 33 items, including three filter items.
- Goleman's (1998) mixed EI scale: This is labeled CSCALE in this paper and was used to collect data for the comparative model (i.e. CMODEL). It has four dimensions (i.e. self-awareness, self-management, social awareness and relationship management) and 30 items.

Each of these scales was associated with five Likert levels, with each level assigned a numeric code as follows: strongly disagree (1), disagree (2), not sure (3), agree (4) and strongly agree (5). With respect to this scale, only 4 and 5 represent respondents' agreement to items of the measurement scales. Based on Petrides and Furnham (2000) therefore, an emotionally intelligent population of health workers should account for a whole-scale mean score of approximately 4 after an average of all validated items is taken as a way of generating the overall EI variable. Hence, the closer the resulting whole-scale mean score is to 5, the higher the level of EI in the population. Based on Schutte *et al.* (1998), the whole-scale mean score did not include negative or filter items associated with Schutte *et al.*'s (1998) scale (i.e. BNK MODEL).

Data were collected after having the study approved by management of participating healthcare institutions and GHS in the Greater Accra Region of Ghana. Each participant also formally agreed to participate by signing an informed consent form. Out of 1,163 questionnaires administered, 848 were completed and returned by participants. However, 37 returned questionnaires had major response and non-response errors and were therefore dropped. Hence, 811 questionnaires were analyzed.

Data were analyzed using SPSS-AMOS version 21. Data analysis was done in two phases. In the first phase, the internal consistency and validity of the two scales were verified using a blend of EFA and CFA. The CA/CR > 0.70 and communality > 0.5 criteria were used to assess scale reliability at the level of EFA, whereas CR $>$ AVE and/or AVE $>$ 0.5 and MSV $<$ AVE and/or ASV $<$ AVE criteria were used to assess convergent and discriminant validity, respectively, through CFA.

Before the computation of CA, CR, AVE, MSV and ASV, EFA was used to identify and eliminate items having a communality value of less than 0.5 in an iterative process in accordance to Hurley *et al.* (1997). This process led to the elimination of 22 items (including the three negative items) from Schutte *et al.*'s (1998) scale and 13 items from Goleman's

(1998) scale. The measurement CFA model was then specified for each scale (Figure 1 and Figure 2).

The two CFA models were compared using fit statistics recommended by Hurley *et al.* (1997) and Kelava (2016): chi-square (χ^2), *p*-value, Tucker–Lewis Index (TLI), root mean square error of approximation (RMSEA) and Akaike information criterion (AIC). However, decision about the best model was made in view of AIC based on the recommendation of Kelava (2016). Moreover, based on Hurley *et al.* (1997), only items which are significantly related to their underlying latent construct in the CFA and therefore account for a critical ratio (C.R.) of at least 2 are used as indicators of health workers' EI. Based on Petrides and Furnham (2000), the average of such retained indicators was computed to generate the overall EI variable for each scale.

The EI level of health workers was examined in the second phase using the one-sample *t*-test and independent-samples *t*-test. The one-sample *t*-test was used to test the hypothesis that the whole-scale mean is significantly greater than 4, which is the minimum value that must be produced if health workers in the study population are emotionally intelligent. Hence the researchers expected to confirm this hypothesis to conclude that health workers in

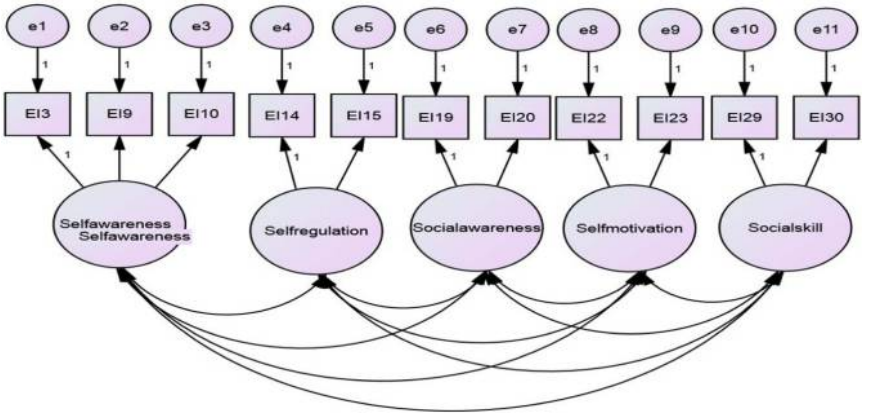

Figure 1.
Measurement model (BNK MODEL)

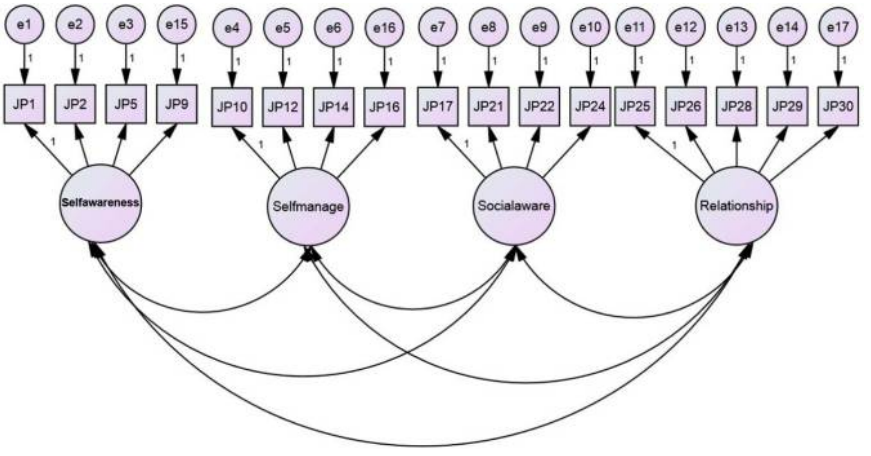

Figure 2.
Measurement model (CMODEL)

the population have appreciable EI, though reaching a mean score of 4 is sufficient to make this decision. The independent-samples *t*-test was used to compare health workers' EI for the BNK MODEL and CMODEL. It was used to test the hypothesis that the EI of health workers accounted by the two models is different. Results of data analysis are presented in the next section.

Results

Phase 1

As seen in Table II, 11 out of 33 items of Schutte *et al.'s* (1998) EI scale (i.e. BNK MODEL) were retained in the EFA after three iterations. A total variance of 55.1 per cent is accounted by the 11 remaining items. With respect to Goleman's (1998) EI scale (i.e. CMODEL), a total variance of 62.3 per cent is accounted by 17 items retained in the EFA after two iterations.

Table III shows reliability and validity statistics associated with the remaining items of each scale. For the BNK MODEL, each dimension has CA and CR values less than the baseline value of 0.7. Nevertheless, the overall BNK MODEL is reliable on the basis of CA/CR > 0.7. The intraclass correlation (ICC) values and their corresponding $p < 0.05$ results also reflect the considerable reliability of the 11 items of the BNK MODEL. The CMODEL, on the other hand, has each of its dimensions (i.e. in terms of the remaining 17 items) satisfying the 0.7 baseline criterion for CA and CR. Moreover, each of the dimensions of CMODEL is associated with a significant *F*-test of the ICC ($p < 0.05$). It is thus evident that the CMODEL is of better reliability when compared to the BNK MODEL.

In Table III, the AVE statistic assesses convergent validity of the two models, whereas MSV and AVS statistics are used to assess their discriminant validity. For the BNK MODEL, the AVE > 0.5 criterion recommended by researchers (Hurley *et al.*, 1997; Schutte *et al.*, 1998) is achieved for each dimension and the overall model, but the CR $>$ AVE criterion is not achieved. For the CMODEL however, the AVE > 0.5 and CR $>$ AVE criteria are met for all dimensions and the whole model. Hence, unlike the BNK MODEL, the CMODEL's convergent validity is well confirmed. Both models, nonetheless, have sufficient discriminant validity on the basis of satisfying the MSV $<$ AVE and ASV $<$ AVE criteria.

In Table IV, the two models have a good fit based on these recommended criteria (Hurley *et al.*, 1997): χ^2 *p*-value > 0.05, TLI > 0.9 and RMSEA > 0.05. Based on Kelava (2016), the CMODEL is, however, better than the BNK MODEL on the basis of having a smaller AIC. In the light of all the fit indices in Table IV, CMODEL better fits the population of health workers. In Table V, self-awareness is significantly related to each of its remaining indicators at the 5 per cent significance level, with each item accounting for a C.R. of at least 2. Self-regulation, social awareness and self-motivation are related to their remaining indicators at the 5 per cent significance level. In Table VI, all retained indicators relate to their underlying latent constructs at the 5 per cent significance level. Items of the CMODEL also account for larger C.R.s in view of the C.R. > 2 criterion, further suggesting that Goleman's (1998) scale better fits the study population.

Phase 2

Table VII shows the whole-scale mean score of health workers for both models. BNK MODEL (mean = 3.95, SD = 0.55) has a lower mean score relative to the CMODEL (mean = 4.10, SD = 0.61). Results of the *t*-test (in terms of the CMODEL) indicate that the average EI level of 4.10 is significantly greater than the expected EI level of 4 at the 1 per cent significance level ($t = 4.59$, $p = 0.000$). At the same level of significance, the average EI of health workers with respect to the BNK MODEL is not significantly different from the expected value of 4 ($t = -2.444$, $p = 0.015$).

Table II. Communalities of indicators of each scale retained

BNK MODEL	Indicator	EI3	EI9	EI10	EI14	EI15	EI19	EI20	EI22	EI23	EI29	EI30						
	Initial	0.37	0.51	0.44	0.44	0.43	0.68	0.68	0.60	0.55	0.51	0.54						
	Extraction	0.60	0.56	0.74	0.52	0.65	0.96	0.88	0.73	0.61	0.63	0.65						
CMODEL	Indicator	JP1	JP2	JP5	JP9	JP10	JP12	JP14	JP16	JP17	JP21	JP22	JP24	JP25	JP26	JP28	JP29	JP30
	Initial	0.62	0.67	0.54	0.76	0.73	0.57	0.63	0.67	0.66	0.73	0.69	0.72	0.65	0.68	0.63	0.69	0.65
	Extraction	0.53	0.66	0.50	0.68	0.91	0.60	0.60	0.69	0.64	0.54	0.57	0.68	0.66	0.68	0.81	0.67	0.59

Note: BNK MODEL: [Kaiser–Meyer–Olkin = 0.73; Bartlett's test (χ^2 = 2867.7), df = 55, p = 0.000); total variance explained = 55.1%] CMODEL: [Kaiser–Meyer–Olkin = 0.83; Bartlett's test (χ^2 = 9458.0), df = 136, p = 0.000); total variance explained = 62.3%]

Model	Construct	CA	CR	ICC 95% CI Single measure	Lower limit	Upper limit	p-value (F-test)	AVE	MSV	ASV
BNK	Self-awareness	0.532	0.607	0.275	0.231	0.320	0.000	0.501	0.001	0.0002
MODEL	Self-regulation	0.453	0.528	0.293	0.229	0.355	0.000	0.488	0.137	0.0158
	Social awareness	0.225	0.260	0.127	0.058	0.194	0.000	0.167	0.165	0.0106
	Self-motivation	0.634	0.619	0.464	0.409	0.417	0.000	0.511	0.165	0.0230
	Social skill	0.403	0.478	0.252	0.187	0.318	0.000	0.321	0.137	0.0144
	Overall (EI)	0.776	0.751	0.240	0.217	0.265	0.000	——-	——	——-
CMODEL	Self-awareness	0.726	0.701	0.398	0.361	0.436	0.000	0.663	0.114	0.1058
	Self-management	0.745	0.720	0.422	0.384	0.459	0.000	0.654	0.055	0.0470
	Social awareness	0.728	0.703	0.401	0.364	0.438	0.000	0.699	0.123	0.0834
	Relationship management	0.803	0.778	0.449	0.415	0.482	0.000	0.705	0.123	0.0972
	Overall (EI)	0.922	0.897	0.412	0.386	0.439	0.000	——-	——	——-

Table III. Reliability and validity statistics

Notes: CA = Cronbach's alpha; CR = composite reliability; ICC = intraclass correlations; CI = confidence interval; AVE = average variance estimate; MSV = maximum shared squared variance; AVS = average shared squared variance

Model	DF	Chi-square (χ^2)	Fit statistic p-value	TLI	AIC	RMSEA
BNK MODEL	34	67.675	0.167	0.963	131.675	0.035
CMODEL	113	132.221	0.487	0.999	124.932	0.014

Table IV. CFA model fit statistics

Notes: DF = degree of freedom; TLI = Tucker–Lewis index; RMSEA = root mean square error approximation; AIC = Akaike information criterion

Table VIII shows results of the independent-samples t-test, which verifies whether the two models yield different EI levels. In this table, the Levene's test for equality of variances is not significant at the 1 per cent significance level ($F = 0.645$, $p = 0.422$). This result confirms that the two models are associated with data of equal variances. For this reason, equal variances assumed (EVA) statistics are read and interpreted. The t-test results corresponding to EVA indicate that the mean scores of the two models are different at the 1 per cent significance level ($t = -5.045$, $p = 0.000$). Thus, health workers are more emotionally intelligent in terms of the CMODEL when compared to the BNK MODEL. So, whereas health workers have considerable EI level with respect to both models, they are more emotionally intelligent at the level of the CMODEL.

Discussion

Data analysis shows that the EI of health workers in the study population is high on the basis of the measurement scale yielding an appreciably large whole-scale mean score, which represents about 82 per cent (for the CMODEL) and 79 per cent (for the BNK MODEL) of the

Type of estimate	Variable	Path	Variable	Estimate	SE	C.R.	*p*-value
Weights	EI3	<—	Self-awareness	1			
	EI9	<—	Self-awareness	0.875	0.394	2.221	0.026
	EI10	<—	Self-awareness	0.246	0.109	2.247	0.025
	EI14	<—	Self-regulation	1			
	EI15	<—	Self-regulation	0.488	0.064	7.623	***
	EI19	<—	Social-awareness	1			
	EI20	<—	Social-awareness	0.767	0.079	9.688	***
	EI22	<—	Self-motivation	1			
	EI23	<—	Self-motivation	0.894	0.049	18.07	***
	EI29	<—	Social skill	1			
	EI30	<—	Social skill	0.009	0.018	0.526	0.600
Covariance	Self-awareness	<–>	Self-motivation	0.023	0.011	2.156	0.030
	Self-awareness	<–>	Social awareness	0.006	0.004	1.554	0.120
	Self-awareness	<–>	Self-regulation	0.032	0.014	2.205	0.030
	Social awareness	<–>	Self-motivation	0.406	0.035	11.63	***
	Social awareness	<–>	Social skill	−0.016	0.032	−0.479	0.630
	Self-regulation	<–>	Self-motivation	0.332	0.030	11.09	***
	Self-regulation	<–>	Social awareness	0.072	0.029	2.466	0.010
	Self-motivation	<–>	Social skill	0.303	0.030	9.983	***
	Self-regulation	<–>	Social skill	0.370	0.035	10.59	***
	Self-awareness	<–>	Social skill	0.033	0.015	2.217	0.030

Notes: C.R. = critical ratio; SE = standard error; ***Relationship significant at the 1% significance level

Table V.
Unstandardized regression estimates (BNK MODEL)

Type of estimate	Variable	Path	Variable	Estimate	SE	C.R.	*p*-value
Weight	JP1	<—	Self-awareness	1			
	JP2	<—	Self-awareness	1.181	0.063	18.6	***
	JP5	<—	Self-awareness	1.069	0.067	16.0	***
	JP10	<—	Self-manage	1			
	JP12	<—	Self-manage	1.579	0.127	12.4	***
	JP14	<—	Self-manage	1.682	0.131	12.8	***
	JP17	<—	Social aware	1			
	JP21	<—	Social aware	1.155	0.085	13.6	***
	JP22	<—	Social aware	0.866	0.067	13.0	***
	JP24	<—	Social aware	1.393	0.101	13.8	***
	JP25	<—	Relationship	1			
	JP26	<—	Relationship	0.946	0.052	18.3	***
	JP28	<—	Relationship	0.579	0.049	11.7	***
	JP29	<—	Relationship	1.015	0.055	18.6	***
	JP9	<—	Self-awareness	0.858	0.058	14.8	***
	JP16	<—	Self-manage	2.01	0.165	12.2	***
	JP30	<—	Relationship	1.062	0.047	22.8	***
Covariance	Social aware	<–>	Relationship	0.35	0.029	12.1	***
	Self-manage	<–>	Relationship	0.234	0.023	10.4	***
	Self-awareness	<–>	Relationship	0.338	0.024	14.1	***
	Self-manage	<–>	Social aware	0.217	0.023	9.34	***
	Self-awareness	<–>	Social aware	0.284	0.025	11.4	***
	Self-awareness	<–>	Self-manage	0.198	0.019	10.3	***

Notes: C.R. = critical ratio; SE = standard error; ***Relationship significant at the 1% significance level

Table VI.
Unstandardized regression estimates (CMODEL)

maximum expected mean score. This result supports the EI theory of Goleman (1995), which asserts that every individual has some considerable level of EI at birth.

The high level of EI reached in this study is also consistent with several studies. Opuni *et al.* (2014), for instance, reached a considerable whole-scale mean score of 3.4, which is 68 per cent of the maximum expected mean score, in the hospitality sector in Ghana. Interestingly, Opuni *et al.* (2014) applied the Emotional and Social Competency Inventory scale, which is similar to the CMODEL. In the banking sector in Pakistan, Saddam-Hussain and Muhammad (2010), based on Schuette *et al.*'s (1998) scale (i.e. BNK MODEL), reached a mean score of 3.80, which is about 76 per cent of the maximum expected mean score. In the study of Tyczkowski *et al.* (2015), which was focused on nurses, a whole-scale mean score of 107.76 was produced, which represents about 82 per cent of the maximum mean score expected, with the measurement scale in this study being the EQ-i 2.0. Nwankwo *et al.* (2013) also used the measurement scale of Schutte *et al.* (1998) to reach a whole-scale mean score of 122.65, which makes up about 82 per cent of the maximum expected mean score. Several other researchers (Ünal, 2014; Olakitan, 2014) reached significantly high EI levels in different sectors across different jurisdictions and measurement scales. There is therefore no doubt that the EI of different groups of workers is substantial, regardless of the measurement scale, sector and jurisdiction involved.

Worth noting is the fact that some researchers (Saddam-Hussain and Muhammad, 2010; Nwankwo *et al.*, 2013) used the same measurement scale in their study but generated extremely different mean scores. This discrepancy came as a result of these studies using different methods for reducing the dimension of their measurement scale. Whereas Opuni *et al.* (2014) and Saddam-Hussain and Muhammad (2010) applied the data reduction method used in this study, Nwankwo *et al.* (2013) simply parceled all validated items of their measurement scale.

The CMODEL better fits or underlies the study population than the BNK MODEL after some items of both scales were eliminated in an iterative EFA. This means that none of the original scales used to assess health workers' EI exactly fits the population. Apart from better fitting the study population, the CMODEL is of higher reliability and validity. Based on Bar-On (1997), this result implies that the CMODEL is a better tool for assessing EI from its theoretical perspective, which is a productivity improvement context. This being the case, the CMODEL is more suitable for assessing EI in the study population and in populations where employee productivity improvement takes precedence over leadership enhancement. This assertion is made in view of the fact that performance improvement in healthcare institutions is a basic global agenda (Freshman and Rubino, 2002; Schwirian, 1978), unlike leadership improvement, which is a secondary goal pursued by individual healthcare institutions (Freshman and Rubino, 2002).

Table VII.
The one-sample *t*-test

				Test value = 4					
								95% CI of the difference	
Model	*n*	Mean	SD	*t*	df	*p*-value	Mean difference	Lower	Upper
BNK MODEL	811	3.95	0.55	−2.444	810	0.015	−0.047	−0.085	−0.009
CMODEL	811	4.10	0.61	4.590	810	0.000	0.099	0.056	0.141

Note: The *p*-value is 2-tailed

Table VIII.
The independent-samples *t*-test

							t-test for equality of means						
				Levene's test for equality of means								95% CI of the difference	
Model	*N*	Mean	SD	Assumptions	*F*	Sig.	*t*	df	*p*-value	Mean difference	SE difference	Lower	Upper
BNK MODEL	811	3.95	0.55	EVA	0.645	0.422	−5.045	1620	0.000	−0.146	0.029	−0.203	−0.089
CMODEL	811	4.10	0.61	EVNA			−5.045	1603.4	0.000	−0.146	0.029	−0.203	−0.089

Notes: EVA = equal variances assumed; EVNA = equal variances not assumed

This study also retains all the theoretical factors of the two models tested, though many items were eliminated in EFA. This result supports the argument of Petrides and Furnham (2000) that EI scales are sensitive to culture and therefore easily change in terms of their constituent items and factor structure. This result is also consistent with the study of Schutte *et al.* (1998), in which a majority of the original items of the measurement scale were removed to reach their 33-item scale. In the study of Petrides and Furnham (2000), a four-factor structure solution was realized out of Schutte *et al.'s* (1998) five-factor model. Gignac *et al.* (2005) also investigated the factor structures of two different EI models, including the model of Salovey and Meyer (1990). Their investigation led to the realization of models with either extra or fewer dimensions. Evidently, all previous validations of mixed EI scales, including the two compared in this study, have resulted in different factor structures. Therefore, by failing to retain all items of the BNK MODEL and CMODEL in the validation process, this study supports the volatility of EI scales across populations and cultures.

This study's results imply that failing to properly validate an EI scale before applying its data in research could be associated with misleading findings. To illustrate, if data associated with the BNK MODEL in this study should be used without thorough validation, a majority of the items removed from it will be incorporated in the measurement of EI, which can lead to underestimated effect size (s), as irrelevant items technically have relatively low extraction or communality values and thus hinder the role of relevant indicators (Hurley *et al.*, 1997; Schutte *et al.*, 1998; Gignac *et al.*, 2005). In essence, proper scale validation is not optional; it is mandatory in any quantitative study that involves EI and possibly other scales.

6. Conclusion and recommendation

Health workers in Accra North are emotionally intelligent within the framework of items retained in the EFA and CFA for both models, though their level of EI has room for improvement, especially with respect to the BNK MODEL.

The CMODEL fits the population of health professionals than the BNK MODEL. The CMODEL is thus a more suitable scale for measuring EI in this study's population when compared to the BNK model. The implication is that the level of EI in a population and the individual items to use in measuring EI in that population are not the same for different measurement scales – there is always a scale that is the most reliable and valid and therefore represents the most useful tool of measurement.

Results of this study imply that every researcher measuring or assessing EI must validate his or her adopted scales from their theoretical points of view. It is ideal for such validation to take place in a pilot study for the researcher to be able to compare competing models, choose the most suitable one and leverage lessons taken from the validation process to develop a theoretical framework that is in ample harmony with hypotheses and research objectives.

References

Allwood, C.M. (2012), "The distinction between qualitative and quantitative research methods is problematic", *Quality & Quantity*, Vol. 46 No. 5, pp. 1417-1429, doi: http://dx.doi.org/10.1007/s11135-011-9455-8.

Alnidawy, A.A.B. (2015), "The effect of emotional intelligence on job satisfaction: applied study in the Jordanian telecommunication sector", *International Journal of Business Administration*, Vol. 6 No. 3, pp. 63-71, doi: http://dx.doi.org/10.5430/ijba.v6n3p63.

Bakr, M.M. and Safaan, S.M. (2012), "Emotional intelligence: a key for Nurses' performance", *Journal of American Science*, Vol. 8 No. 11, pp. 385-393.

Bar-On, R. (1988), "The development of an operational concept of psychological well-being", Unpublished doctoral dissertation, Rhodes University, South Africa.

Bar-On, R. (1997), "Development of the Bar-On EQ-i: a measure of emotional and social intelligence", Paper presented at the 105th Annual Convention of the American Psychological Association in Chicago.

Bar-On, R. and Parker, J. (2000), *Handbook of Emotional Intelligence*, Jossey-Bass, San Francisco, CA.

Bowen, P., Pilkington, A. and Rose, R. (2016), "The relationship between emotional intelligence and well-being in academic employees", *International Journal of Social Science Studies*, Vol. 4 No. 5, pp. 1-9, doi: http://dx.doi.org/10.11114/ijsss.v4i5.1487.

Danquah, E. and Wireko, T.B. (2014), "The impact of each element of emotional intelligence on customer service delivery: a customer satisfaction perspective", *International Journal of Sales and Marketing Management Research and Development*, Vol. 4 No. 2, pp. 9-20.

Drost, E.A. (2011), "Validity and reliability in social science research", *Education Research and Perspectives*, Vol. 38 No. 1, pp. 105-123.

Farooq, M.U. and ur Rehman, K. (2011), "Emotional intelligence and organizational productivity: a conceptual study", *World Applied Sciences Journal*, Vol. 15 No. 6, pp. 821-825.

Freshman, B. and Rubino, L. (2002), "Emotional intelligence: a core competency for health care administrators", *The Health Care Manager*, Vol. 20 No. 4, pp. 1-9.

Gardner, H. (1983), *Frames of Mind*, Basic Books, New York, NY.

Gignac, G.E., Palmer, B.R., Manocha, R. and Stough, C. (2005), "An examination of the factor structure of the Schutte Self-Report Emotional Intelligence (SSREI) scale via confirmatory factor analysis", *Personality and Individual Differences*, Vol. 39 No. 6, pp. 1029-1042, doi: http://dx.doi.org/10.1016/j.paid.2005.03.014.

Goleman, D. (1995), *Emotional Intelligence*, Bantam Books, Inc, New York, NY.

Goleman, D. (1998), *Working with Emotional Intelligence*, Bantam Books, New York, NY.

Hurley, A.E., Scandura, T.A., Schriesheim, C.A., Brannick, M.T., Seers, A., Vandenberg, R.J. and Williams, L. (1997), "Exploratory and confirmatory factor analysis: guidelines, issues, and alternatives", *Journal of Organizational Behavior*, Vol. 18 No. 6, pp. 667-683.

Kaur, D., Sambasivan, M. and Kumar, N. (2015), "Significance of spiritual (SI) and emotional intelligence (EI) on the caring behavior of nurses", *Journal of Community & Public Health Nursing*, Vol. 1 No. 2, pp. 1-3, doi: http://dx.doi.org/10.4172/jcphn.1000101.

Kelava, A. (2016), "A review of confirmatory factor analysis for applied research (second edition)", *Journal of Educational and Behavioral Statistics*, Vol. 20 No. 10, pp. 1-5, doi: http://dx.doi.org/10.3102/1076998616631747.

Kernbach, S. and Schutte, N.S. (2005), "The impact of service provider emotional intelligence on customer satisfaction", *Journal of Service Marketing*, Vol. 19 No. 7, pp. 12-19, doi: http://dx.doi.org/10.1108/08876040510625945.

Krejcie, R.V. and Morgan, D.W. (1970), "Determining sample size for research activities", *Educational and Psychological Measurement*, Vol. 30 No. 3, pp. 607-610, doi: http://dx.doi.org/10.1177/001316447003000308.

Mayer, J.D. (2008), "Human abilities: emotional intelligence", *Annual Review of Psychology*, Vol. 59 No. 1, pp. 507-536, doi: http://dx.doi.org/10.1146/annurev.psych.59.103006.093646.

Mayer, J.D. and Salovey, P. (1997), "What is emotional intelligence: implications for educators", in Salovey, P. and Sluyter, D. (Eds), *Emotional Development, Emotional Literacy, and Emotional Intelligence*, Basic Books, New York, NY, pp. 3-31.

Morse, J.M. (2002), "Verification strategies for establishing reliability and validity in research", *Journal of Educational Research*, Vol. 6 No. 9, pp. 56-63.

Nwankwo, B.E., Obi, T.C., Sydney-Agbor, N., Agu, S.A. and Aboh, J.U. (2013), "Relationship between emotional intelligence and job satisfaction among health workers", *IOSR Journal of Nursing and Health Science (Science)*, Vol. 2 No. 5, pp. 19-23.

Olakitan, O.O. (2014), "Emotional intelligence and perceived leadership behaviour effectiveness in organization", *International Journal of Humanities and Social Science*, Vol. 4 No. 2, pp. 262-269.

Opuni, F.F., Opoku, E. and Oseku-Afful, M. (2014), "The effect of relationship marketing on service quality and customer satisfaction in the hospitality sector in Ghana: the moderating role of service providers' emotional intelligence", *British Journal of Marketing Studies*, Vol. 2 No. 6, pp. 1-16.

Özer, O., Hamarta, E. and Deniz, M.E. (2016), "Emotional intelligence, core-self evaluation, and life satisfaction", *Psychology*, Vol. 7 No. 2, pp. 145-153, doi: http://dx.doi.org/10.4236/psych.2016.72017.

Petrides, K.V. and Furnham, A. (2000), "On the dimensional structure of emotional intelligence", *Personality and Individual Differences*, Vol. 29 No. 2, pp. 313-320.

Ringner, M. (2008), "What is principal component analysis?", *Nature Biotechnology*, Vol. 26 No. 3, pp. 303-304.

Saddam-Hussain, R. and Muhammad, I. (2010), "Emotional intelligence and organizational performance: (a case study of banking sector in Pakistan)", *International Journal of Business and Management*, Vol. 5 No. 10, pp. 191-197.

Salovey, P. and Mayer, J.D. (1989), "Emotional intelligence", *Imagination, Cognition, and Personality*, Vol. 9 No. 3, pp. 185-211.

Salovey, P. and Mayer, J.D. (1990), "Emotional intelligence", *Imagination, Cognition, and Personality*, Vol. 9 No. 1, pp. 185-211.

Schwirian, P.M. (1978), "Evaluating the performance of nurses: a multi-dimensional approach", *Nursing Research*, Vol. 27 No. 6, pp. 347-351.

Schutte, S.N., Malouff, J.M., Hall, L.E., Haggerty, D.J., Cooper, J.T., Golden, C.J. and Dornheim, L. (1998), "Development and validation of a measure of emotional intelligence", *Personality and Individual Differences*, Vol. 25 No. 2, pp. 167-177.

Shahhosseini, M., Silong, A.D., Ismail, I.A. and Nak Uli, J. (2012), "The role of emotional intelligence on job performance", *International Journal of Business and Social Sciences*, Vol. 3 No. 21, pp. 241-245.

Tipping, M.E. and Bishop, M.B. (1999), "Probabilistic principal component analysis", *Journal of the Royal Statistical Society, Series B*, Vol. 61 No. 3, pp. 611-622, doi: http://dx.doi.org/10.1111/1467-9868.00196.

Tyczkowski, B., Vandenhouten, C., Reilly, J. and Kubsch, S.M. (2015), "Emotional intelligence (EI) and nursing leadership styles among nurse managers", *Nursing Administration*, Vol. 39 No. 2, pp. 172-180.

Ünal, Z.M. (2014), "The contribution of emotional intelligence on the components of burnout: the case of health care sector professionals", *Electronic Journal of Business Ethics and Organization Studies*, Vol. 19 No. 2, pp. 27-34.

Further reading

Brackett, M.A., Mayer, J.D. and Warner, R.M. (2004), "Emotional intelligence and its relation to everyday behavior", *Personality and Individual Differences*, Vol. 36 No. 6, pp. 1387-1402.

Lane, A.M., Meyer, B.B., Devonport, T.J., Davies, K.A., Thelwell, R., Gill, G.S., Diehl, C.D.H., Wilson, M. and Weston, N. (2009), "Validity of the emotional intelligence scale for use in sport", *Journal of Sports Science and Medicine*, Vol. 8 No. 2, pp. 289-295.

Mayer, J.D., Salovey, P. and Caruso, D.R. (2004), "Emotional intelligence: theory, findings, and implications", *Psychological Inquiry*, Vol. 15 No. 3, pp. 197-215.

Corresponding author
Nestor Asiamah can be contacted at: nestor.asiamah@yahoo.com