REVIEW ARTICLE

Synthesizing Preliminary Normative Values for the Hong Kong Brief Version of World Health Organization Quality of Life Scale: A Review of Published Studies 1997 - 2014

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ABSTRACT

Background: To synthesize preliminary normative values from published data of the Hong Kong version of World Health Organization Quality of life scale–brief version (WHOQOL-BREF-HK) and to identify areas for nursing attention and further research.

Methods: Design: A literature review. **Data sources**: The literature search was performed from January 1997 to December 2014. Keywords including WHOQOL-BREF-HK, Quality of life, Brief, Scale, and Hong Kong Chinese were used to search the following electronic data bases: Journals @ Ovid Full Text, EBM Reviews, EMBase, PsycInfo, DARE and Ovid Medline. In addition, hand searching of the reference lists of retrieved articles was performed. **Review methods**: Studies were selected when they adopted the WHOQOL-BREF-HK as a measurement. The scale has four domains. Studies with incomplete domain data were excluded. The WHOQOL-BREF-HK data were extracted from the selected studies by one of the authors independently and checked by the other author to ensure accuracy. The extracted data, presented in raw score, are considered as the preliminary normative values.

Results: The twenty-three studies selected for the review included 3,480 subjects (mean age ranged from 31 to 76 years). The preliminary normative values were displayed in the results section to show the mean score of the four domains of the WHOQOL-BREF-HK of each study by subject classifications (subject characteristics, sample size, mean age, percentage of female subjects), and by three categories of people (well, sick and those with specific life events). The synthesis of the values shows some interesting trends, including people with schizophrenia tend to have the poorest quality of life, and sick people after completing a course of treatment with a possible remission tend to achieve quality of life similar to well people. These trends deserve nursing attention and further research with a population-based sample.

Conclusion: Given that population-based normative data for WHOQOL-BREF-HK are unavailable, the values presented in this study, although limited by not using methodological recommendations for normalization of quality of life instruments, offer a preliminary and helpful source for cross references for Chinese people living in Hong Kong. The findings also provide pointers for further research, and help nurses to make better decisions in clinical practice.

Keywords: *Quality of life; Review literature; Measurements; WHOQOL-BREF-HK; Normative values*

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Introduction

Paradigm shift from the biomedical paradigm that focuses mainly on physiological outcomes to the social science paradigm that encompasses the functioning and overall well-being as the focus of healthcare delivery has contributed to the increasing use of quality of life (QOL) as an important outcome measure worldwide (Shiu et al. 2014). Hong Kong has witnessed this paradigm shift and the field of QOL research has been flourishing since 1990s (Leung et al. 1997).

QOL, before it was defined by the World Health Organization QOL group in 1990s (WHOQOL Group 1995), has got as many definitions as it has been studied. This confusion was in part caused by mistaking some objective parameters such as standard of living as a synonym or substitute of QOL (Skevington 2002). The WHOQOL group defines QOL as 'an individual's perceptions of their position in life, in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns' (WHOQOL Group 1995, p.1403). The group has made an outstanding contribution to the field of QOL by including the cultural component in its definition and in the development of its measurement. Based on a multi-national/regional collaboration (including sites in North America, Central Europe, Southern Africa, South-East Asia and Australia), the group has developed a range of versions of the WHOQOL scales for each respective nation/region (Skevington 2002).

The WHOQOL scales are generic measures, assessing non-disease-specific QOL, the key benefit of which is to offer comparison across different disease categories, and between well and sick populations. Subsequently, the WHOQOL scales were empirically shortened and psychometrically tested to establish brief scales (WHOQOL-BREF) so as to decrease respondent burden (Skevington et al. 2004).

The Hong Kong version of WHOQOL-BREF (WHOQOL-BREF-HK), psychometrically evaluated in 1997, shows adequate validity and reliability (Leung et al. 1997). It has four domains: physical health (7 items), psychological (8 items), social relationships (3 items) and environment (8 items), and two individual items measuring overall QOL and general health, giving a total of 28 items. Within the psychological domain, two specific items have been incorporated to measure the extent of satisfaction with 'being respected' and 'eating', reflecting Chinese culture (Leung et al. 1997). Items are rated on a five-point Likert scale (raw score: 28 - 140) with a high score indicating a better QOL. The profile of four domains is found to be more adequate expression of QOL than the total score (Hawthorne et al. 2006, Leung et al. 1997).

Since the seminal publication of the Manual of the WHOQOL-BREF-HK in 1997 (Leung et al. 1997), research applying the scale has been accumulating, resulting in a considerable amount of published data that reflect the QOL status of Hong Kong Chinese people. Its psychometric properties are highly regarded that it has been used in validating other health-related QOL scales (e.g., Yeung et al. 2006). Nevertheless, population-based normative data for WHOQOL-BREF are unavailable in China and are still scarce in the literature (Cruz et al. 2011, Hawthorne et al. 2006, Noerholm et al. 2004, Ohaeri et al. 2009). The scarcity may be in part due to the difficulty in obtaining funding for such large scale studies.

Aim

This study aimed to synthesize preliminary normative values from published WHOQOL-BREF-HK data and to identify areas for nursing attention and further research.

Methods

A literature search was performed from January 1997 (since the publication of the Manual by Leung et al. 1997) to December 2014, using keywords WHOQOL-BREF-HK, Quality of Life, Brief, Scale, and Hong Kong Chinese with the following electronic data bases - Journals @ Ovid Full Text, EBM Reviews, EMBase, PsycInfo, DARE and Ovid Medline. In addition, hand searching of the reference lists of retrieved articles was performed. Studies were selected when they adopted WHOQOL-BREF-HK as a measurement but those with incomplete domain data were excluded. The WHOQOL-BREF-HK data were extracted from the selected studies by one of the authors independently and checked by the other author to ensure accuracy. Standardizing the presentation of the retrieved WHOQOL-BREF-HK data was necessary because the published data were reported in the form of raw score (28 - 140) or transformed score. For the latter, either one of the two transformation methods (Leung et al. 1997) were used: transforming the raw score to 4 – 20

or 0 – 100. For the ease of comparison, we reconverted all such score to the raw score (28 - 140). The extracted data thus presented were considered as the preliminary normative values.

Results

The initial literature search yielded twenty-seven studies. Four of the studies (Ling et al. 2007, Yau et al. 2005, Fung & Chien 2002, Chien & Lee 2008) were excluded because of incomplete domain data. Our review, therefore, included twenty-three studies (Chan & Chan 2007, Chan et al. 2006, Chan et al. 2007, Chan et al. 2009, Chan & Yu 2004, Cheng et al. 2004, Cheuk et al. 2008, Cheung et al. 2001, Ho et al. 2000, Hu et al. 2008, Kwok et al. 2006, Kong & Molassiotis 1999, Lai et al. 2009, Leung et al. 2005, Li et al. 2004, Molassiotis et al. 2000, Molassiotis et al. 2002, Pan et al. 2008, Shum et al. 2014, Xiang et al. 2009, Yeung et al. 2006, Yu et al. 2000, Yu et al. 2010).

Table 1 presents the preliminary WHOQOL-BREF-HK normative values extracted from the twenty-three studies. It displays the mean score of the four domains of the WHOQOL-BREF-HK by subject classifications (subject characteristics, sample size, mean age, percentage of female subjects) of each of the study.

Subject characteristics are organized into three categories of subjects: well, sick and those with specific life events, with six studies reporting the data from two categories of subjects (ie. two samples). Two of the six studies compared the QOL of well subjects and those with sickness (Chan et al. 2006) and subjects with a specific life event (Cheng et al. 2004), respectively. Three of the six studies compared QOL of sick subjects with the same disease but of different stages or progression (Cheuk et al. 2008, Hu et al. 2008, Kong & Molassiotis et al. 2002). The last of the six studies compared the QOL of two samples of women attending obstetrics and gynaecological care with and without any history of intimate partner violence (Leung et al. 2005).

Among the twenty-three studies selected for the review, three reported data from well people (Chan et al. 2006, Cheng et al. 2004, Li et al. 2004) and two presented data from people undergoing a specific life events (Cheng et al. 2004, Shum et al. 2014). Among the rest of the studies with sick people as subjects, fifteen and five studies were conducted with people with physical (Chan & Chan 2007, Cheuk et al. 2008, Cheung et al. 2001, Ho et al. 2000, Hu et al. 2008, Kong

& Molassiotis 1999, Kwok et al. 2006, Lai et al, 2009, Leung et al. 2005, Molassiotis et al. 2000, Molassiotis et al. 2002,Pan et al. 2008, Yeung et al. 2006, Yu et al. 2000, Yu et al. 2010) and mental health problems (Chan et al. 2009, Chan et al. 2007, Chan et al. 2006, Chan & Yu 2004, Xiang et al. 2009), respectively.

The twenty-three studies involved a total of 3,480 subjects with sample sizes ranging from 9 (Ho et al. 2000) to 361 subjects (Li et al. 2004). Subjects' mean age ranged from 31 (Ho et al. 2000) to 76 years old (Yu et al. 2010). The percentage of female subjects ranged from 9 (Molassiotis et al. 2002) to 100 (Lai et al. 2009, Leung et al. 2005, Li et al. 2004, Molassiotis et al. 2000).

As shown in Table 1, the mean physical health domain score ranged from 13.3 to 28.06, with people affected by epilepsy following temporal lobectomy (Ho et al. 2000) scoring the lowest and those affected by thalassemia but had obtained hematopoietic stem cell transplantation (Cheuk et al. 2008) scoring the highest. Of note is that these two studies have a small sample size of 15 subjects (Cheuk et al. 2008) and 9 (Ho et al. 2000).

The mean psychological domain score ranged from 12.80 to 30.66, with people affected by epilepsy following temporal lobectomy (Ho et al. 2000) scoring the lowest and those affected by early stages of cervical cancer scoring the highest (Lai et al. 2009). The mean social relationships domain score ranged from 7.06 to 14.10, with elders affected by depression (Chan et al. 2009) scoring the lowest and those people affected by epilepsy following temporal lobectomy (Ho et al. 2000) scoring the highest. Of note is that latter study has a small sample size of 9 subjects (Ho et al. 2000).

The mean environment domain score ranged from 13.40 to 30.20, with people affected by epilepsy following temporal lobectomy (Ho et al. 2000) scoring the lowest and people attending the department of Obstetrics and Gynaecology for care and without any history of intimate partner violence (Leung et al. 2005) scoring the highest. Approximately half of the sample of the latter study attended the department for antenatal care.

Of note is that people affected by thalassemia and subsequently had obtained hematopoietic stem cell transplantation (Cheuk et al. 2008), women affected by early stages of cervical cancer (Lai et al. 2009) as well as those with gastrectomy conducted due to gastric tu-

mor (Yeung et al. 2006) obtained the four domain score close to those of well people (Chan et al. 2006, Cheng et al. 2004, Li et al. 2004).

Comparing the data by the three categories of people (ie. well, sick and those with specific life events) shows that well people tend to obtain the highest domain score. A comparison of the five studies with people affected by mental health problems (Chan et al. 2009, Chan et al. 2007, Chan et al. 2006, Chan & Yu 2004, Xiang et al. 2009) shows that people with schizophrenia and using long-term mood stabilizers had the worst domain score (Xiang et al. 2009), except the social relationships domain.

Ten of the twenty-three studies reported the strengths and/or weaknesses of the WHOQOL-BREF-HK in their application (Chan et al. 2006, Chan et al. 2007, Chan & Yu 2004, Ho et al. 2000, Kwok et al. 2006, Kong & Molassiotis 1999, Leung et al. 2005, Molassiotis et al. 2002, Yeung et al. 2006, Yu et al. 2000). The most commonly identified strength was the inclusion of Chinese cultural-specific items of 'being respected' and 'eating' (Kong & Molassiotis 1999, Molassiotis et al. 2002, Yeung et al. 2006, Yu et al. 2000). The most commonly identified weakness was being a subjective instrument measuring generic QOL, thus the application may miss the disease-specific aspects of patients of specific disease categories (Chan et al. 2007, Chan & Yu 2004, Ho et al. 2000, Kwok et al. 2006, Yu et al. 2000).

Discussion

This study aimed to synthesize preliminary normative values from the published WHOQOL-BREF-HK data for Hong Kong Chinese people. Although the synthesis is not based on methodological recommendations for normalization of QOL instruments (Gandek & Ware 1998), it covers 17 years of published investigations of twenty-three studies with 3,480 Hong Kong Chinese people. Obviously, the synthesis has limitations. Apart from the methodological problem, only three of the studies provide data for healthy people; some of the studies have small samples; and although the selected studies cover a range of health problems, the coverage is by no means comprehensive. Although the synthesis is limited, we suggest that, until a population-based normalization study is published, the data displayed in Table 1 can serve as a useful reference of preliminary normative values of WHOQOL-BREF-HK, providing a sense of the QOL status in Hong Kong Chi-

nese population. We also identified some interesting trends and issues for discussion and further research.

Firstly, comparing the preliminary normative values of well people with those of sick people and people with specific life events shows that well people generally attained a higher QOL status. This pattern is consistent with international population-based normative data reports (Cruz et al. 2011, Hawthorne et al. 2006, Noerholm et al. 2004, Ohaeri et al. 2009). Moreover, our analysis shows that Hong Kong studies targeting well people were few with age-range of subjects limited to mid-life and elders. Moreover, the values cannot show any obvious influence of gender and age on WHOQOL scoring. Population-based norms for Australia (Hawthorne et al. 2006) and Brazil (Cruz et al. 2011) show that women have lower QOL and that it varies across lifespan. We suggest that future research with Chinese people should examine these areas using a population-based random sample (Gandek & Ware 1998).

Secondly, the values indicate that people with schizophrenia tend to have the worst QOL among those with mental health problems. This finding, consistent with a Spanish study (Lucas-Carrasco 2011) with 1,082 patents, deserves research and clinical attention to enhance the QOL of people with schizophrenia. Living with a chronic disease such as schizophrenia creates a specific set of circumstances whereby nurse-patient relationship and interaction may contribute to achieving better QOL.

Thirdly, three studies (Cheuk et al. 2008, Lai et al. 2009, Yeung et al. 2006) with sick people show that their score is similar to those of well people, suggesting that sick people after completing a course of treatment with a possible remission or those people with cancer discovered at early stages for interventions may regain a QOL status similar to well people. In contrast, the study with patients who were still affected by epilepsy following temporal lobectomy (Ho et al. 2000) suggests that after receiving an invasive treatment but without remission, patients may suffer from poorer QOL. Although this phenomenon makes clinical sense, these studies (Cheuk et al. 2008, Ho et al. 2000) are limited by a small sample size causing problems of generalizability. This phenomenon deserves further research and clinical attention. The hope of a brighter future with improved QOL status may be adopted by nurses to encourage patients undergoing a treatment regimen. Similarly, nurses should pay special attention to patients

whose hope for a remission or cure is shattered after completing a course of treatment.

Finally, our review reinforces the outstanding contribution of the WHOQOL-BRE-HK to the field of QOL research in Hong Kong, especially in terms of allowing the comparison across different disease categories, and between well and sick populations. The inclusion of an item each on 'being respected' and 'eating' is regarded as the key strength of the WHOQOL-BRE-HK, acknowledging the cultural significance to the perceptions of QOL status for Chinese (Kong & Molassiotis 1999, Molassiotis et al. 2002, Yeung et al. 2006, Yu et al. 2000). We agree that this is the key strength. In addition, we have a hunch. With only the two items in the 28-item scale may not adequately acknowledge the weight of how satisfied or bothered people are due to these cultural issues in the overall QOL status of Chinese people. Indeed, the qualitative component of one of the selected studies (Molassiotis et al. 2000) found that the importance assigned to some of the items of the scale was different, but the study did not explore further this issue. We, therefore, suggest further research to examine the pros and cons of using individual weighting of the WHOQOL-BREF-HK items, similar to that adopted in the Audit of Diabetes-Dependent QOL (Ostini et al. 2012), which allows the subjects to judge to what extent each of the items is relevant and important to their QOL.

Conclusion

The preliminary normative values for the WHOQOL-BREF-HK presented in this paper offer a convenient and helpful source for cross references until a population-based study for Hong Kong Chinese is available. The findings reinforce the contribution of the WHOQOL-BREF-HK to the field of QOL in Hong Kong and have implications for research and nursing practice. The findings may provide pointers for further research and development of strategies for the enhancement of QOL of Hong Kong Chinese people living in Hong Kong and beyond.

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Table 1. Preliminary WHOQOL- BREF-HK normative values extracted from twenty-three published studies

Subject characteristics	Sample size.	Age, years, mean (SD)	% of female subject	Physical health, mean (SD)	Psychological, mean (SD)	Social relationships, Mean (SD)	Environment, mean (SD)	Reference
Well people								
Elders without depression [a]	179	NR[1]	43	24.48(4.81)	27.68(4.84)	9.95(1.76)	29.34(3.82)	Chan et al. 2006
Community dwelling people [b]	184	34.51(8.71)	60	25.48(3.50)	27.42(4.20)	10.18(1.71)	27.48(4.90)	Cheng et al. 2004
People attending contraceptive service	361	34.42(5.74)	100	26.57(3.57)	29.26(3.97)	10.86(1.63)	27.78(4.15)	Li et al. 2004
Sick people								
People with physical health problems								
Patients with spinal cord injury and using wheelchair	31	41.68(11.17)	20	18.71(5.01)	25.38(5.96)	9.71(1.87)	24.23(4.19)	Chan & Chan 2007
Patients with thalassemia but had obtained hematopoietic stem cell transplantation [c]	15	NR[2]	67	28.06(3.46)	30.42(3.78)	11.90(1.12)	29.08(3.61)	Cheuk et al. 2008
Patients with thalassemia and did not have hematopoietic stem cell transplantation [c]	70	NR[3]	49	24.90(4.12)	29.35(5.01)	11.17(2.17)	28.82(4.67)	Cheuk et al. 2008
Patients with bowel or bladder cancer and one week following stoma surgery	18	58.80 (10)	28	16.86(3.09)	20.33(4.96)	10.56(1.65)	24.35(3.71)	Cheung et al. 2001
Patients with epilepsy following temporal lobectomy	9	31.00(2)	44	13.30(2.50)	12.80(3.00)	14.10(1.40)	13.40(3.00)	Ho et al. 2000
Traumatic spinal cord injury resulting in complete paraplegia [d]	30	48.00(16.4)	57	20.94(3.11)	24.54(4.70)	9.10(1.73)	24.45(4.61)	Hu et al. 2008

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Subject characteristics	Sample size.	Age, years, mean (SD)	% of female subject	Physical health, mean (SD)	Psychological, mean (SD)	Social relationships, Mean (SD)	Environment, mean (SD)	Reference
Traumatic spinal cord injury resulting in in-complete paraplegia[d]	28	48.00(16.4)	57	22.12(3.78)	27.71(5.95)	10.44(2.38)	27.52(4.86)	Hu et al. 2008
Patients with renal transplant less than one year[e]	23	39.50(7.83)	36	23.65(3.69)	27.09(3.73)	11.35(6.21)	25.61(4.18)	Kong & Molassiotis 1999
Patients with renal transplant over one year[e]	78	39.50(7.83)	36	24.50(4.24)	28.13(4.89)	10.05(1.80)	27.01(4.40)	Kong & Molassiotis 1999
Stroke survivors at 3 months	303	70.50(11.6)	50	22.68 (NR[8])	25.92(NR[8])	11.28(NR[8])	30.08(NR[8])	Kwok et al. 2006
Patients with early stages of cervical cancer and assessed 2.4 year after diagnosis	173	54.76(14.67)	100	25.29(4.95)	30.66(6.69)	8.71(2.15)	29.86(5.14)	Lai et al. 2009
People attending a department of Obstetrics and Gynaecology and without any history of intimate partner violence[f]	114	NR[4]	100	28.00(3.32)	30.20(3.80)	10.58(1.42)	30.20(3.40)	Leung et al. 2005
People attending a department of Obstetrics and Gynaecology for care and suffering from intimate partner violence[f]	114	NR[4]	100	25.03(3.85)	27.80(4.80)	9.38(1.50)	26.80(4.00)	Leung et al. 2005
Patients with early stages of gynaecological (57% ovarian, 32% cervical, 11% endometrial) cancers	62	51.17(12.20)	100	24.20(5.20)	25.84(5.90)	10.47(1.73)	25.44(5.32)	Molassiotis et al. 2000

Subject characteristics	Sample size.	Age, years, mean (SD)	% of female subject	Physical health, mean (SD)	Psychological, mean (SD)	Social relationships, Mean (SD)	Environment, mean (SD)	Reference
Patients with symptomatic HIV disease	35	39.10(10.8)	9	22.80(2.85)	26.03(4.01)	9.65(1.58)	25.42(3.68)	Molassiotis et al. 2002
Stroke survivors at 3 months	247	68.80(NR)	46	22.76(4.74)	26.72(6.27)	10.99(1.71)	29.74(5.16)	Pan et al. 2008
Patients with gastric tumor and gastrectomy performed within half to three years	140	65.19(12.8)	37	26.53(3.85)	27.94(4.40)	10.86(1.60)	29.62(3.24)	Yeung et al. 2006
Patients referred to departments of clinical oncology for cancer treatment (breast, liver, lung, head and neck, nasopharyngeal)	141	52.70(12.3)	42	23.40(5.40)	26.20(5.70)	10.60(1.70)	25.80(4.60)	Yu et al. 2000
Patients with admission due to chronic heart failure assessed on the day of discharge	121	76.10(7.7)	51	21.38(3.80)	23.64(4.90)	10.42(1.42)	26.97(3.82)	Yu et al. 2010
People with mental health problems								
Patients with schizophrenia and without active psychotic symptoms	176	NR[5]	48	22.84(4.60)	24.18(5.64)	9.31(2.08)	24.84(4.88)	Chan & Yu 2004
Older patients with depression [a]	80	NR[6]	76	17.96(3.62)	16.72(3.10)	8.18(1.59)	21.44(3.24)	Chan et al. 2006
Older patients with depression	77	72.70(5.1)	79	17.26(4.76)	17.84(4.52)	7.06(2.08)	22.08(4.14)	Chan et al. 2009
Patients with schizophrenia for at least 2 years, attending out-patient departments for care and living in sheltered environment	176	NR[7]	52	23.26(5.08)	24.76(5.60)	9.32(2.10)	25.12(5.00)	Chan et al. 2007
Patients with schizophrenia and using long-term mood stabilizers	255	42.33(8.88)	53	14.16(2.45)	13.43(2.85)	12.99(2.64)	13.56(2.31)	Xiang et al. 2009

Subject characteristics	Sample size.	Age, years, mean (SD)	% of female subject	Physical health, mean (SD)	Psychological, mean (SD)	Social relationships, Mean (SD)	Environment, mean (SD)	Reference
Specific life events								
Survivors one month after recovery from serious acute respiratory syndrome [b]	100	37.14(12.09)	66	21.04(3.03)	25.74(4.06)	10.54(1.41)	26.12(4.74)	Cheng et al. 2004
Carers of patients with colorectal cancer	140	54.00(14.6)	74	25.35(NR[4])	26.20(NR[4])	10.63(NR[4])	27.96(NR[4])	Shum et al. 2014

Remarks: a Chan et al. 2006 cover two samples: well people and people with mental health problems. b Cheng et al. 2004 cover two samples: well people and people with specific life events. c Cheuk et al. 2008 cover two samples: patients with and without hematopoietic stem cell transplantation. d Hu et al. 2008 cover two samples: patients with complete and incomplete paraplegia. e Kong & Molassiotis 1999 cover two samples: patients with renal transplant less than and over one year. f Leung et al. 2005 cover two samples: patients seeking obstetric or gynaecological care and patients seeking the care in addition to intimate partner violence. NR1 = mean not reported, ranging from 65-95 years; NR2 = mean not reported, median 18.2 years; NR3 = mean not reported, median 22.1 years; NR4 = Not reported, NR5 = mean not reported, ranging from 18-65 years; NR6 = mean not reported, ranging from 65-90 years; NR6 = mean not reported, ranging from 35-55 years, NR8 = the domain data were median value, mean and SD not reported.