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Applications of Health Related Quality of Life (HRQoL) as an Intervention Impact Assessment in the Management of Hypertension; A Systematic Review

Bolarinwa Oladimeji Akeem[1, 2], Essiet Inimfon Aniema[1], Muhamad Hanafiah Bin Juni[1, *], Nor Afiah Binti Mohd Zuilkefi[1], Salmiah Binti Md Said[1], Tanimola Makanjuola Akande[2]

[1]Department of Community Health, Faculty of Medicine and Health Sciences, University Putra Malaysia (UPM), Selangor, Malaysia
[2]Department of Epidemiology and Community Health, Faculty of Clinical Sciences, University of Ilorin, Ilorin, Nigeria

Email address
hanafiah_juni@upm.edu.my (M. H. B. Juni)

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Abstract
Introduction: Persons living with hypertension wrestle with the physical, psychological, and social demands of their illness without adequate help or support from medical care. This has buttressed the need to research into the perceptions of patients in the context of their subjective feelings towards their wellbeing. This is termed "health related quality of life (HRQoL)". One of the most important goals of all health interventions is to improve the quality of life of persons affected by disease and many researchers had advocated for the need to see health outcome beyond clinical and laboratory parameter alone. Therefore need to study and assess HRQoL as well. This study however set out to review available intervention studies in the scientific literature from 1980 till date (that met the set eligible criteria) and those which employed quality of life as a primary outcome measurement. *Methods:* The PRISMA and Standard Cochrane Collaboration systematic review techniques were used as guidelines for the review while varieties of online journals, database and library were searched. These yielded over a thousand articles which were screened systematically using stringent eligibility criteria to scale down to 37 articles out of which 6 articles employed intervention as study approach and quality of life as primary outcome measurement. *Results:* The age range of the participants in the review is between 18 to 80 years. Results revealed that only 4 out of the 6 articles were randomized control trial (RCT) out of which only one was blinded. Four of the studies used SF-36 tool for assessment of HRQoL. Another Four studies reported statistically significant increase in overall HRQoL of intervention group over a control group. Two studies did not analyze significance level. The individual dimensions of HRQoL revealed discrepancies in the reviewed articles. Mental health improvement was observed to be the only common improved outcome across the studies. *Conclusion:* It was concluded that there is still dearth of literature on HRQoL outcome assessment of hypertensive studies. It is suggested that future research on interventional studies should endeavor to use quality of life as a

primary or as part of outcome measurements.

1. Introduction

Hypertension (HTN) or high blood pressure is a chronic cardiac medical condition in which the systemic arterial blood pressure is elevated. The report of the panel appointed to the seventh and eighth Joint National Committee (JNC-7 &JNC-8) on guidelines for the management of hypertension in adults (James, et al. 2014; Chobanian, et al. 2003) defined hypertension as a mean systolic blood pressure (SBP) of 140 mmHg and above, with or as an isolated mean diastolic blood pressure (DBP) of 90 mmHg and above. Hypertension is found in all populations of the world and is becoming a huge burden to low and medium income countries. There is a continuous, consistent, and independent relationship between elevated BP and risk of cardiovascular events (Lewington, et al. 2003). Therefore the higher the BP, the greater is the chance of heart attack, heart failure, stroke, and kidney diseases (James, P.A., et al 2014; Chobanian, A.V., et al. 2003).

Hypertension like other chronic cardiac diseases presents challenges to the sufferers and their families which include; dealing with symptoms, disability, emotional impacts, complex medication regimens, difficult lifestyle adjustments, and obtaining helpful medical care (Wagner, et al. 2001). This mean that persons with hypertension wrestle with the physical, psychological, and social demands of their illness without much help or support from medical care (Wagner, et al. 2001). Management of hypertension has been predominantly hospital or clinic based all over the world. While the coverage has been somewhat adequate in developed countries the coverage of hypertensive healthcare services has been inadequate in low resource countries. There have been reported high cases of up to three-quarters of hypertensive patients that are not on treatment even when treatment was indicated in almost 50% of them (Nelissen, et al. 2014). In addition, poor medical outcomes have been recorded among the hypertensive patients by researchers (Nelissen et al. 2014; Opadijo, et al 2003; Ike, et al. 2003) in Nigeria and this was shown to be associated with poor blood pressure control and target organ damage (Ogunlana, et al 2009).

Just like it is important in all forms of chronic illnesses, there is need to maintain improved quality of life among hypertensive patients. World Health Organization (WHO), defines quality of life as “individuals’ perception 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, 1998). In the domain of physical health and illness, quality of life refers to participant’s self-evaluation of health or to their perceived functional status and well-being (Wandell et al 2005). This simply means the degree to which a person enjoys the important possibilities of his life (Odili, et al. 2010). Similar definitions have been given by other authors (WHOQOL GROUP., 1998; Issa, B.A., et al. 2006). These different definitions of quality of life stem from the multi-disciplinary use of the term. Therefore, one of the most important goals of all health interventions is to improve the quality of life of persons affected by disease (Rubin, et al 1999).

There are different reasons why measuring the quality of life of hypertensive patients is important; Firstly, the assessment of successful outcome of treating persons with hypertension has been limited to the conventional clinical focused measurement, like blood pressure control, adherence to treatment and acceptable laboratory parameters that assess target organ damage. However, meeting optimum values for the above may not necessarily bring a satisfactory general health status perception to the patient. Therefore, other, more subjective, patient-focused measures are needed to augment the outcome evaluation for patients (Kring, DL 2008). Secondly, the concept of health according to WHO goes beyond just the absence of disease or infirmity (WHO; 1948), therefore for the health of a person with hypertension to remain in a complete state of physical, mental and social well-being, it will preclude other factors beyond current clinical indicators (Wilson et al 1995; Ferrans 2005). Lastly, understanding the quality of life of hypertension patients as well as factors that influence them may assist health workers in developing and implementing interventions targeted at improving their care (Kring, DL. 2008).

Past interventional researches (Staessen, et al 2004; Pezzin et al 2010; Bernochi, et al., 2014) on hypertension while seeking for indicator to measure the intervention outcomes of their researches focused more on medical outcomes without taking into cognizance the importance of quality of life that the patient perceive before and after the intervention. The evaluation of a patient total well-being should no longer be viewed from disease control and management alone but the quality of life the patients will live in complete state of well-being. This is a subjective feelings and perception about his health and other related factors that have direct and indirect associations to his health status. It is mostly important in the clinical treatment of chronic illnesses like hypertension. This is because the patients are faced with more challenges in adjusting with the chronicity of the diseases, the unending usage of medication (with requires absolute adherence), regular and continuous clinic attendants, lifestyle modification compliant and organ failure due to complication which reduces their quality of life further. Patient total well-being should no longer be viewed from disease control and management alone but with the HRQoL. This review however assessed evidences from published intervention studies on hypertension care that applied Health related quality of life (HRQoL) as a measure of study clinical outcome.

2. Methodology

2.1. Eligibility Criteria

Studies that carry out various forms of hospital based and community based hypertensive care as intervention were included in this study. The eligible studies recruited adult

hypertensive patients with essential hypertension. The main or primary clinical outcome measurement for the evaluation of the intervention was basically quality of life assessment. Though the intervention could adopt any scientific study design with a control arm (comparative group), the intervention should be directed to either the patients solely and or to the health workers.

2.2. Search Method

Electronic database were search for mainly in this review. Published intervention studies that met predefined eligibility criteria were however included in the review. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher et al 2009) and Standard Cochrane Collaboration systematic review techniques were used as guidelines for the review (Higgins et al 2011). The following databases were searched; PubMed from the 1980s, EBSCO host, SAGE journal online, Science direct, SCOPUS, and other full online database like JET P and Google scholar. The main search keywords were intervention, quality of life and hypertension. Other synonyms like; care, trial, blood pressure and health related quality of life were also used to expand the search. We also used logical Boolean operators to narrow and broaden our search as appropriate. The search keywords follow the same pattern used by Ogedegbe et al (2004)

2.3. Type of Study Participants

Adult hypertensive patients either previously or newly diagnosed with essential hypertension and being managed in a hospital setting.

2.4. Types of Intervention

a) Scientifically acceptable intervention methods with a control group.
b) Intervention directed to hypertensive patient care
c) Intervention directed to health system or health professional
d) Intervention delivered by health workers (Nurses, pharmacist, doctors, community health workers etc)
e) Intervention that is hospital or community based
f) Intervention studies that are randomized control trials, quasi-experimental or other analytical studies

2.5. Type of Outcome Measures

a) Health related quality of life measurement as primary outcome
b) With or without other clinical outcomes like BP, adherence as secondary outcomes

2.6. Literature Collection and Data Extraction

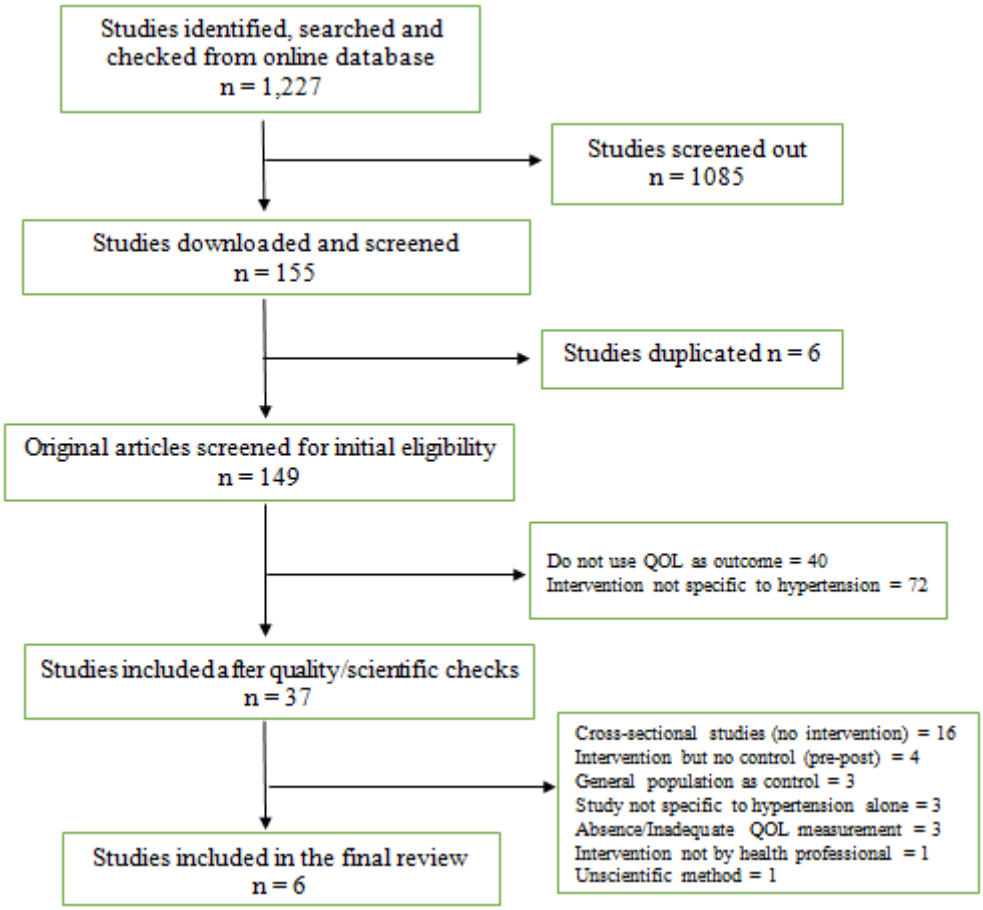

Figure 1. *Flowchart for the systematic review for the studies.*

The literature review was carried out by the first author with contribution and subsequent review by the co-researchers. The initial data base literature search and yielded 1,227 authored journals out of which 155 were downloaded after first round of eligibility screening. Six papers were shown to have been duplicated from 155 published articles leaving 149 articles. Forty (40) articles did not use QOL as an outcome measure while 72 articles' interventions were not specific essential hypertension. Out of remaining 37 articles that were studied, 31 articles were further excluded for failing one eligibility criteria or the other ass shown in figure 1. Six (6) articles were included in final review and analysis. Data was extracted by downloading all the 37 full articles. These were printed out for extensive examination and summarization of important results. Quality assessment was carried out with the use of CONSORT checklist (2010).

3. Results

A total of 31 original articles were screened out of this review as shown in Table1. They were categorized into 7 different exclusion clusters. The largest excluded clusters of articles (16) were the cross-sectional studies with no hypertension interventions (Figure1 and Table1). There were 4 studies that were interventional studies but had no comparative group (control arm). Some other studies (3) had control arm but this arm was from the general population thereby bringing to question the external validity of such comparison. They were therefore excluded from the study. Three other studies belonged to the cluster of those articles either absent or inadequate scientific measurement of QoL. One study had intervention carried out by non-health professionals (yoga) and the last cluster of an article has what we termed "unscientific intervention" (reflexology) (see Table1).

The review (Table 2) reveals that only one (Cote et al 2005) out of the 6 reviewed articles is from high income country (Canada). The lowest age range of the reviewed articles was 18 years (Cote et al 2005; Ebid et al 2014; Saleem et al 2013) while highest range was 80 years (Cote et al 2005; Ebid et al 2014). The studies had varied sample sizes and only Aghajani et al (2013) had 3 arms of study. Four studies out of 6, recorded attrition rate of above 20% in their studies (table2). All the articles intervened on patients with primary (essential) hypertension who are already diagnosed cases of hypertension likewise except one (Wal et al 2013) which intervened on newly diagnosed patients (Table2).

Table 1. *Excluded studies from the review.*

Study (Year)	Location	Reason for exclusion
Adepu R., et al (2011)	India	Diabetic and hypertensive patients studied (outside the review scope)
AkhtarM.M., et al (2014)	Pakistan	No control used
Ali Pourmoghaddas et al (2014)	Iran	Healthy general population used as control
Al-jabi S.W., et al (2013)	Palestine	Cross-sectional study (no intervention)
Ayalon L., et al (2006)	Israel	Cross-sectional / secondary data
Baune B.T., (2005)	Gaza strip	Stroke and hypertension studied
Biradar S.S et al (2012)	India	Inadequate analysis on QOL
Blumenthal (1990)	USA	No specific QOL assessment tool used
Calvalho (2013)	Brazil	Healthy general population used as control
Chin Y.R., et al (2014)	South Korea	Population-based cross-sectional survey
Lu C.H., et al (2015)	China	QOL not measured
Elshamy K., et al (2011)	Egypt	No scientific intervention (reflexology)
Erickson S.R., et al (2004)	USA	Cross-sectional (no intervention)
Gusmao et al (2009)	Brazil	No control group
Holt et al (2010)	USA	Cross-sectional study
Kathikenyan et al (2014)	India	Cross-sectional (no control group)
Khawet al (2011)	Malaysia	General population used as control
Liang et al (2006)	China	Cross-sectional (no intervention)
Ogunlana et al (2009)	Nigeria	Cross-sectional (no intervention)
Roopa et al (2014)	India	Diabetic and hypertensive patients (no control)
Santos et al (2013)	Portugal	Cross-sectional (no intervention)
Shashina et al (2010)	India	Pre- post intervention (no control)
Shanableh (2010)	UAE	Cross-sectional (no intervention)
Stanley et al (2011)	USA	Cross-sectional (no intervention)
Stein et al (2002)	USA	Cross-sectional (no intervention)
Theodorou et al (2011)	Cyprus	Cross-sectional (no intervention)
Ha et al (2014)	Vietnam	Cross-sectional (no intervention)
Wolff et al (2013)	Sweden	Intervention not by health professional (yoga)
Youseff et al (2005)	Egypt	Cross-sectional (no intervention)
Zoellner et al (2014)	USA	Cross-sectional (QOL not used)
Zygmuntowicz et al (2014)	Poland	Cross-sectional (no intervention)

Table 2. *Characteristics of the reviewed studies.*

Study(year)	Country	Age ofpatients	Sample size	Attrition	Clinical Attributeof participants
Aghajani M., et al (2013)	Iran	35 - 65	Intervention1 = 40 Intervention2 = 40 Control = 40	Intervention1 = 10(25%) Intervention2 = 10(25%) Control = 10 (25%)	*Primary hypertension *Old patients (over 1 year) *BP > 140 & 90 (SBP&DBP)
HU YU et al (1999)	China	28 - 75	Intervention = 139 Control = 139	Intervention = 5 (3.6%) Control = 8 (5.8%)	*Primary hypertension * Mild hypertension
Cote I., et al (2005)	Canada	18 - 80	Intervention = 35 Control = 56	20 (18%) *For total participants	*Primary hypertension *On hypertensive > 3 months *No modification to treatment for > 3 months
Ebid AM., et al (2014)	Egypt	18 - 80	Intervention = 140 Control = 140	Intervention = 15 (10.7%) Control = 33 (23.6%)	*Primary hypertension (old) *Both controlled & Uncontrolled
Saleem F., et al (2013)	Pakistan	≥ 18	Intervention = 193 Control = 192	Intervention = 73 (37.8) Control = 48 (25%)	*Primary hypertension *Old patients *On antihypertensive for ≥ 6 months
Wal P., et al (2013)	India	20 - 75	Intervention = 72 Control = 70	Intervention = 18(25%) Control = 22 (31.4%)	*Primary hypertension *Newly diagnosed

Four out of the 6 articles were randomized controlled trials while the remaining 2 were quasi-experiment study. Only one article (Wal et al 2013) used block randomization while Hu Yu et al. (1999) was the only study that mentioned use of double blinding and placebo (Table3). Three articles (Cote et al 2005; Saleem et al 2013; Wal et al 2013) had their interventions administered for 9 months; one article (Ebid et al 2014) intervention was on for 3 months while the other 2 studies' (Aghajani et al 2013 & Hu Yu et al 1999) interventions were on for 2 months. In 5 of the 6 studies, the intervention was education targeted at lifestyle modification and adherence in while only one (Hu Yu et al 1999) was drug trial. Out of the 5 studies that were education interventions, 4 of them were pharmacist driven education intervention and only one (Aghajani et al 2013) was driven by nurses under the supervision of cardiologist. Quality of life alone was the primary outcome measurement in 3 studies while in the other 3 studies, elicited other outcomes like blood pressure, knowledge, attitude, practice, medication adherence. RAND SF-36 was used solely for measurement of HRQoL in 3 studies. Hu Yu et al (1999) used TOMHS and SF_2-36 while Ebid et al (2014) used structured questionnaire adapted from another study (Biradar et al). Saleem et al (2013) used EQ-5 for the measurement for HRQoL and DAI-10 for medication adherence (Table3).

Table 3. *Methodological approaches of the reviewed studies.*

Study(year)	Study design	Duration of intervention	Intervention components	Outcome measurement	Tools of measurement
Aghajani M., et al (2013)	Quasi experiment	2 months	*2 arms of intervention; *2 sections of lectures + group discussion + education handbook *Self-education handbook only	HRQoL	SF-36
HU YU et al (1999)	*RCT *double blind *Placebo	12 weeks	*4 weeks screening with placebo *4 weeks Captopril titration *8 weeks Captopril maintenance	HRQoL	*TOMHS *SF_2 - 36
Cote I., et al (2005)	Quasi experiment	9 months	*Pharmacy-driven intervention program *PRECEDE-PROCEED model	HRQoL	SF-36
Ebid AM., et al (2014)	RCT	3 months	*Pharmaceutical care program *Education and lifestyle modification	*HRQoL *BP *KAP * Medication adherence	*Structured questionnaire (Biradar et al)
Saleem F., et al (2013)	*RCT *non-clinical	9 months	Hospital Pharmacist administered health education intervention	*HRQoL *Knowledge *Medication adherence	*DAI-10 = medication adherence *EQ-5 = HRQoL
Wal P., et al (2013)	*RCT *block randomization	9 months	*Pharmaceutical care intervention *Pictorial aided lifestyle modification	*HRQoL *BP	SF-36

Only one study (Cote et al 2005) failed to calculate the mean overall score of HRQoL while another study (Wal et al) did not compare the overall score in the 2 arms of study for statistical significance (table4). Aghajani et al (2013) reported a statistically significant difference (p=0.004) in the overall score in the 3 arms of the drug trials. Hu Yu et al (1999) also reported p-value of 0.0025 while similarly Ebid et al (2014) and Saleem et al (2013) reported p-value of 0.001 apiece.

However only one study (Hu Yu et al 1999) analyzed and used mean change (between pre and post variables) in the studies arms as comparison. Out of the 4 studies that reported comparison of other outcomes aside HRQoL, only 3 of them analyzed the level of significance. This difference between the intervention and control arms was shown to be significant (Table 4). Most commonly sort after outcome indicators among these studies were systolic blood pressure and diastolic blood pressure.

By disaggregating the analyses into different domains of HRQoL, most of the studies but one (Saleem et al 2013) was able to show the observed difference between studies' arm (Table 5). While 3 studies (Aghajani et al 2013; Hu Yu et al 1999; Cote et al 2005) analyzed treatment effect, other 2 studies (Ebid 2014 &Wal et al 2013) used mean proportions. Aghajani et al (2013) reported significant difference in 7 out of 8 domain of SF-36 with the most remarkable difference observed in Physical function (PF) p=0.003 and Power & Energy (P/E) p = 0.002.The most remarkable difference reported by Hu Yu et al (1999) was in mental health (MH) (3.18 in intervention to 1.32 in control) with p-value 0.0004 and general function (GH) (7.84 increase in intervention to 0.64 increase in control) with a p-value of 0.0025.A reverse finding was reported in MH score of people in low socio-economic strata (LS) in Cote et al (2005) study. A negative score (-7.8) was observed among intervention group while an increase score of 7.1 was observed among the control group (p=0.01). However a significant (p=0.05) treatment effect in P/E (4.6 in intervention to -1.5 in control) was observed among the people of high socio-economic strata (HS).

Table 4. *Comparison of outcome results of the reviewed studies(1).*

Study (year)	Mean Overall HRQoL Score		*p-value*	Other outcomes measured		
	Intervention (±SD)	*Control (±SD)*		*Intervention*	*Control*	*p-value*
Aghajani M., et al (2013)	I_1 = 56.12 (1.1) I_2 = 51.7 (6.9)	40.3 (4.5)	*0.04*	None		
HU YU et al (1999)	7.84 (11.03)	4.19 (10.33)	*0.0025*	SBP = -16.3 (11.61) DBP = -13.1 (7.75) (Mean change)	- 7.7 (10.18) - 6.3 (6.05)	0.000 0.000
Cote I., et al (2005)	Not analysed			Not analysed		
Ebid AM., et al (2014)	111 (79.3)	72 (51.4)	*0.001*	SBP = 135.1 (15.2) DBP = 80.1 (8.2)	142 (20.2) 84.2 (8.9)	0.003 0.001
Saleem F., et al (2013)	EQ-5D= 39.6 (30.2)	47.6 (28.5)	*0.001*	SBP = 137.5 (17.2) DBP = 84.6 (9.9) Adherence = 3.2 (0.9) Knowledge = 10.2 (1.1)	143.9 (19.4) 90.1 (10.5) -1.9 (2.1) 7.8 (1.5)	0.004 0.009 0.001 0.001
Wal P., et al (2013)	66.80 (9.68)	58.02 (9.87)	*Not calculated*	SBP = 139.43 (9.47) DBP = 84.42 (5.16)	132.5 (9.03) 86.72 (5.10)	Not Calculated

Abbreviations
I_1 = Intervention group 1
I_2 = Intervention group 2
SBP = Systolic Blood Pressure
DBP = Diastolic Blood Pressure
EQ-5D = EuroQoL tool for quality of life assessment

Table 5. *Comparison of outcome results of the reviewed studies (2).*

Study (year)	Means difference of HRQoL domains		*p-value*	Remarks/ Quality Judgement
	Intervention (±SD)	*Control (±SD)*		
Aghajani M., et al (2013)	GH I_1 = 2.25 (0.1) I_2 = 0.07 (0.01)	-1.70 (0.01)	*0.04 (all)* *0.01 (I_1& Control)*	*Sequence generation inadequate *Allocation concealment not done *No blinding *High dropout rates
	SF I_1 = 9.81 (1.6) I_2 = 8.22 (1.9)	5.40 (1.4)	*0.01*	
	PF I_1 = 5.70 (1.2) I_2 = 4.90 (0.9)	-1.40 (0.01)	*0.003*	
	PR I_1 = 7.37 (1.8) I_2 = 9.20 (2.0)	0.90 (0.2)	*0.04*	
	P/E I_1 = 9.5 (1.1) I_2 = 0.10 (0.02)	1.10 (0.1)	*0.002*	
	MH I_1 = 5.0 (0.9) I_2 = 4.10 (1.1)	1.30 (0.6)	*0.03*	
HU YU et al (1999)	PH = 3.01 (5.26)	2.23 (4.79)	*0.0435*	*Sequence generation adequate *Allocation concealment done *double blinding
	MH = 3.18 (5.90)	1.32 (5.13)	*0.0004*	
	GF = 7.84 (11.03)	0.64 (3.45)	*0.0025*	

Study (year)	Means difference of HRQoL domains		*p-value*	Remarks/ Quality Judgement
	Intervention (±SD)	*Control (±SD)*		
Cote I., et al (2005)	MH = -7.8 (0.01)	7.1 (0.01) LS strata	*0.01*	*Sequence generation inadequate *Allocation concealment not done *No blinding *Stratification of analysis not necessary
	P/E = 4.6 (0.03)	-1.5 (0.44) HS strata	*0.05*	
Ebid AM., et al (2014)	Enjoy(%) = 102 (72.9)	59 (42.1)	*0.001*	*Sequence generation inadequate *Allocation concealment not done *No blinding *Analysis revealed no mean difference of HRQoL
	Energy(%) = 105(75.0)	86 (61.4)	*0.02*	
	Sleep(%) = 112 (80.0)	92 (65.7)	*0.01*	
Saleem F., et al (2013)	Not analysed			*Sequence generation adequate *Allocation concealment not done *No blinding *Domains of HRQoL not analysed
Wal P., et al (2013)	GH = 64.07 (18.7)	52.29 (14.99)	*Not Calculated*	*Sequence generation adequate *Allocation concealment done *Block randomization *No blinding
	SF = 80.78 (17.95)	70.31 (18.24)		
	PF = 58.33 (31.43)	50.93 (30.89)		
	PR = 73.61 (44.17)	62.50 (48.53)		
	P/E = 48.98 (16.89)	39.16 (20.34)		
	MH = 74.59 (16.50)	69.83 (15.08)		
	ER = 66.66 (47.26)	57.63 (49.58)		
	P = 72.17 (14.58)	63.28 (13.58)		

Abbreviations
GH = General Health, SF = Social Function, PF = Physical function, PR = Physical Role, P/E = Power & Energy, MH = Mental Health, ER = Emotional Role, P = Pain, PH = Physical health, GF = General Function.
LS = Low Socioeconomic Strata
HS = High Socioeconomic Strata

For the other studies with only mean proportions analyzed, Ebid et al (2014) used structured questionnaire to explore various domains of HRQoL. The most remarkable difference in this study was reported in the "enjoy" domain with intervention to control difference of 102(72.9) to 59(42.1) with a p-value of 0.001 (table5). Wal et al (2013) did not analyze the significance levels of all observed differences in all the 8 domains of SF-36 used for their study. This study also used mean proportion score of HRQoL.

4. Discussion

Majority of studies included in the quality checks for this study were cross-sectional studies (16 studies), many of which were screened out because of ineligibility (See table1). Some other study designs were similarly ineligible because they were interventional studies but with no comparison arm (control). This is important because the best of interventional studies were randomized controlled trial (Jekel et al 2008). Some others studies did not satisfy other eligibility criteria for this review either because the outcomes were not specific to QOL measurement or the intervention were not specific to hypertension (See table1). This study screened out what it termed 'unscientific intervention" because interventions like yoga (Wollf et al 2013) and reflexology (Elshamy et al 2011) were not general acclaimed therapy for hypertension or cardiovascular diseases medically. It is interesting that majority of the reviewed articles were from developing countries because hypertensive patients in developing countries are usually face with many challenges in coping with their condition, and the medical care often does not meet their needs for adequate clinical management, psychological support, and information (Wagner et al. 2001). This is because unlike in developing countries, the developed western countries have social health schemes and home based care interventions for chronic diseases which have reduced the untoward effects of the disease on individual quality of life thereby, increasing the accessibility to quality healthcare and the life expectancy (Inglis, et al. 2006; Stewart, et al. 1999; Federman, et al. 2014).

Many of the reviewed studies (Aghajani et al 2013; Ebid et al 2014 Saleem et al 2013 &Wal et al 2013) had a high attrition rate in one or other arms of the intervention group. This could be adduced to the high rate of unallocated patients due to illness (Aghajani et al 2013), lack of adequate tracking strategies for the drop-outs (loss to follow-up) (Ebid et al 2014; Saleem et al 2013; Wal et al 2013) and unwillingness to continue with the study (Saleem et al 2013; Wal et al 2013). It was also observed that the 2 quasi experimental studies in this review recorded high attrition rate (loss to follow-up) which buttress the superiority of randomized control trial (RCT) studies over other forms of study in medical science (Jekel et al 2008). Only one study was clinical trial involving the use of drugs (Yu et al 1999) while the other studies were behavioral/psychological interventions. This shows increasing importance of behavioral research in health science and RCT.

All the studies reviewed attempted to use health related quality of life (HRQoL) as primate outcome measurement of intervention which was the main aim of this review. However, while some of the authors used SF-36 scale (Aghajani et al 2013; HuYu et al 1999; Cote et al 2005; Wal et al 2013) which was developed by RANDS corporations and medical outcome study (MOS) in 1980s. (RANDS). This tool has been adjudged as a widely used questionnaire in assessing physical, social, and mental HRQoL in clinical trials. It is suitable for economic analysis and benefiting healthcare rationing. One author used EQ-5 tool (Saleem et al 2013) which is most commonly used in the European community. EQ-5 scale has been advanced by a collaborative group from Western Europe known as the EuroQol group (Leal et al 2006). The sixth study (Ebid et al 2014) adapted a quality of life tool study from Biradar et al (2012) study.

Report of the HRQoL findings were not uniformed among the 6 studies reviewed. With the exception of 2 studies (Cote et al 2005 &Wal et al 2013) that did not calculate treatment effect on overall HRQoL score, all the remaining studies reported scientifically significant differences in overall post intervention between intervention group and control.

A better HRQoL outcome was recorded among the intervention group over the control group. This was similar to reported findings among some cardiovascular disease studies like a study among congestive cardiac patients on home based nursing care intervention in Spain (Broton et al 2009) and among patients with myocardial infarction on manual self-facilitated home based rehabilitation in China (Wang et al. 2012). However findings reported in this review differed from most other findings from cardiovascular disease studies like Myocardial Infarction (Sinclairs et al. 2005; Dalal et al 2006; Jolly et al. 2009) and stroke (Anderson et al. 2000). More interventional studies on cardiovascular diseases observed little improvement in the HRQoL. This may be connected to the fact that CVDs are mostly irreversible organ damages that result in disability and depleted wellbeing of the patients. This is probably the reason HRQoL should be used more as an outcome measurement of cardiovascular risk morbidity like hypertension. This is because the relationship between hypertension and risk of cardiovascular diseases events is continuous, consistent, and independent of other risk factors. The higher the BP, the greater is the chance of heart attack, heart failure, stroke, and kidney diseases (James, et al 2014; Chobanian, et al. 2003). Looking at the dimensions of HRQoL, Aghajani et al (2013) reported the 7 domains of SF-36 (except general function) were significantly improved upon by the intervention (Table5). Yu et al (1999) reported improvement in 3 domains (physical health, mental health and general functions) while Cote et al (2005) had 2 domains improved. The other studies were non-specific in their findings. Mental health improvement was also observed to be a common effect across the studies. While this is an important finding, researchers were cautious in its interpretation because mental health improvement could be biased by the intervention itself and other determinants of emotional status of the patients.

As far as our search could go, no review has been made on application of HRQoL in assessing hypertension intervention outcome. This review highlighted the use of HRQoL as an outcome measurement in hypertension intervention studies. Though our search yielded many studies, but narrowing down to specifics only yielded 6 studies and this studies showed inadequate analysis of their various findings, making the comparison made during this review incomplete. Another observation was lack of proper treatment effect analysis by most of the authors with the exception of Aghajani et al (2013) which carried out mean difference analysis. We also observe that there are only a few hypertension interventional studies with HRQoL as an outcome measurement. All of the studies reviewed, also did not control for other predictors of HRQoL in their study which could reduce the internal validity. The major limitation of this study is the exclusion of 37 studies (Table1) for ineligibility. They could have provided more insight into analysis gap observed in the reviewed studies. Another limitation is inability to carry out a meta-analysis in this review.

This systematic review concluded that few studies have reported HRQoL as an outcome measurement of hypertension interventional studies though with inadequate analysis. This inadequate analysis made their studies inconclusive. Mental health improvement was observed across almost all the reviewed studies. It is therefore suggested that future research on interventional studies should endeavor to use quality of life as a primary or part of outcome measurement. It will also be desirable for researchers to carry out in-depth analysis of HRQoL so as improve validity and acceptability of such research.

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