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RESEARCH ARTICLE

SEXUAL DYSFUNCTION AND ITS ASSOCIATION WITH PHYSICAL ACTIVITY AMONG ADULTS WITH UNCONTROLLED HYPERTENSION ENROLLED IN SOME SELECTED SPECIALIZED HOSPITALS IN ETHIOPIA

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ABSTRACT

Background: According to high blood pressure statistics, about 1.5 billion people are suffering from high blood pressure world-wide. Arterial hypertension is a major health problem among all population in the world. Hypertension is common risk factors for sexual dysfunction. Study shows that there was a greater tendency for hypertensive adults with or without treatment to have low libido compared with age-matched normotensive adults. So, sexual dysfunction (dissatisfaction) is more frequent in patients with uncontrolled. Research has shown that an improvement in sexual satisfaction among hypertensive adults suffer from sexual dysfunction, as a result of increased physical activity.

Objective: The main objective of this study is to determine the relationship between sexual dysfunction and physical activity among adults with uncontrolled hypertension.

Methods: A nationwide hospital based cross-sectional study design was employed to determine the relationship between physical activity and sexual dysfunction among adults with uncontrolled hypertension. The study was conducted from October 1 to march 30, 2014/15. Six hospitals were selected purposively, from the selected hospitals hypertensive adults' patients were selected by systematic random sampling technique. Interview administered questionnaire, blood pressure and anthropometry measurements were used as a data collection instruments. The study was under go after the approval of Jimma Institutional Review Board (IRB) college of Natural science and receiving support of letter.

Results: Hypertensive patients' participated in regular physical activity had an overall positive effect on sexual satisfaction during sexual activity (M = 1.46, SD= 0.622) than those did not participate in regular physical activity (M = 1.15, SD= 0.374) and hypertensive participants having normal weight had higher overall sexual satisfaction during sexual activity (M=1.63, SD=0.768) than obese (M=1.54, SD=0.616) and overweight participants (M=1.53, SD=0.626). In addition, hypertensive men had slightly higher overall sexual satisfaction during sexual activity (M=1.56, SD=0.721) than hypertensive women (M=1.54, SD=0.644).

Conclusion: Normal weight hypertensive participant's significantly more sexually satisfying than overweight and obese hypertensive participants. And hypertensive patients' participated in physical exercise increased their overall effect of sexual satisfaction than those did not participate in physical activity. Furthermore, hypertensive women were decreased their overall sexual satisfaction during sexual activity than hypertensive men.

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INTRODUCTION

Hypertension is a common risk factor for sexual dysfunction (Quek *et al*., 2008; Ho and Fernández, 2006; Abdulah Al Turki, 2009). There was a greater tendency for hypertensive adults with or without treatment to have low libido compared with age-matched normotensive adults (Bacon *et al*., 2013). So, sexual dysfunction is more frequent in patients with essential hypertension than normotensive subjects (Croog *et al*., 1988; Dusing, 2003). High blood pressure and many antihypertensive drugs might worsen the sexual function because of side effects of anti-hypertensive treatment (Doumas *et al*., 2006). Hypertensive adults have higher rates of sexual dysfunction than normotensive adults (Duncan *et al*., 2000). In addition, women with hypertension had difficulties achieving sexual satisfaction as well as poor lubrication (http://your-doctor.com/healthinfocenter/medical-condition/cardiovascular/hypertension.html). Another studies reported that patients receiving antihypertensive treatment confirmed that a higher

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frequency of decreased libido, difficulty in gaining & sustaining an erection, and difficulty in ejaculating (Chang *et al*., 1991). Adverse effects of antihypertensive therapy on male sexual function, including decreased libido, erectile dysfunction, and ejaculation difficulties, have been reported in several studies (Medical Research Council Working Party on mild to moderate hypertension, report of 1981; Bansal, 1998; Grimm *et al*., 1997). Research has shown an improvement in sexual satisfaction among hypertensive adults suffer from sexual dysfunction, as a result of increased physical activity. Females began an exercise program revealed an increase in vaginal pulse amplitude and vaginal blood volume in both sexual functioning and sexually impaired women (Meston and Gorzalka, 1996). Similarly, men who exercised regularly experienced enhanced sexual encounters including, frequency of intimate activities, increased percentages of pleasing orgasms and sufficient functioning during sex (White *et al*., 1990). Furthermore, study on men also showed that those who exercised vigorously for 30 minutes per day were two and a half times less likely to suffer from erectile dysfunction as compared to men who had limited physical activity (Bacon *et al*., 2006). There for, increased physical activities are associated with an improvement in sexual satisfaction among hypertensive patients with sexual dysfunction (Esposito *et al*., 2004). Physical activity has consistently been shown, in the research literature, to be an effective means of enhance sexual satisfaction and attenuate the occurrence of sexual dysfunction. The available reports are based on studies in the more advanced countries. Therefore, we are not aware of any local Ethiopian study on sexual dysfunction among hypertensive patients. To our knowledge, currently no study has examined the associations between sexual dysfunction and physical activity particularly among patients with uncontrolled hypertension in Ethiopia. Therefore, the purpose of this study was to determine the relationship between sexual dysfunction and physical activity among hypertensive patients. In the current investigation, specific questions addressed in this study were: 1) Is regular physical exercise has influence on levels of sexual satisfaction among hypertensive patients? 2) Does body mass index status has link with sexual satisfaction among hypertensive patients? 3) Is gender related to level of sexual satisfaction among hypertensive patients? The researchers developed three hypotheses that were addressed based on the proposed research questions and findings from other studies. The specific hypotheses that were explored in this study are as follows:

1. Sexual dysfunction would be significantly lower among hypertensive adults who report exercise regularly as compared to do not report exercise regularly.
2. Sexual dysfunction would be significantly lower among normal weight hypertensive adults as compared to overweight and obese hypertensive adults.
3. Sexual dysfunction would be significantly lower among hypertensive men adults as compared to hypertensive women adults.

MATERIALS AND METHODS

Study design and period

A nationwide hospital based cross-sectional study design was employed to determine the relationship between physical activity and sexual dysfunction among adults with uncontrolled hypertension attending in some selected specialized Hospitals in Ethiopia. The study was conducted from October 1 to march 30, 2014/15.

Study Population

All hypertensive adult patients available in Adama medical hospital, Felege Hiwot hospital, Hawassa specialized hospital, Maychew hospital, Tikur Anbessa specialized hospital and Yekatit 12 specialized hospital at the time of study.

Hypertension Assessment

Participant's blood pressure was measured and confirmed by medical doctor to establish the status of blood pressure prior to the study period. If the subject's blood pressure reading was greater than 140 mm Hg and a diastolic arterial BP greater than 90 mm Hg in at least 2 of the 3 measurements, then the subject was considered to have uncontrolled hypertension (Chobanian *et al*., 2003).

Sample size determination

In this study, sample size was determined using single population proportion formula. Taking the overall prevalence of 50 % to obtain the maximum sample size at 95 % certainty and a maximum discrepancy of +5% between the sample and the underlying population; an additional 10 % was added to the sample size as a contingency to increase power. Thus a minimum number of 845 hypertensive adult patients were required in the study.

This is the formula used to determine the sample size:

$$n = \frac{\left(Z\frac{\alpha}{2}\right)^2 .p(1-p)}{d^2}$$

Some basic assumptions of sample size determination $\alpha = 0.05(95\%)$, level of confidence; $p = 0.5$, since the level of sexual dysfunction among hypertensive adult patients is not known, p taken as 50%; d^2 = the degree of precision = 0.05 (5%); sample size (n) = 384

Design effect =nx2= 384x2=768; by adding non response rate 10%; Total sample size = 845

Sampling Procedures

From all Hospitals of Ethiopia, six (6) known and senior Hospitals were selected by using purposive sampling technique. The total sample size (n=845) was allocated proportionally to each selected hospitals. Then, from each selected hospitals, hypertensive adult patients were selected by systematic random sampling. The first study unit was selected randomly between 1st and kth and every kth study unit from the list was selected, then the selected hypertensive adults were subjected for the study.

Data Collection Instruments

I. Questionnaire

Sexual Level Assessment Questionnaire: Assessed an individual's level of sexual satisfaction or dysfunction with the sexual aspect of his or her relationship using a five-point Likert-scale (Rusbult *et al*., 1998).

Physical Activity Frequency Assessment Questionnaire: was measured participants' frequency of exercise. Based on frequency of participation in a week, participants were classified in to regular exercise group and non- regular exercise group (Godin and Shepard, 1985).

II. Anthropometry Measurement

Body weight and height measurement

Height was measured using a wall-mounted stadiometer to the nearest 0.1 cm. Body weight was measured using a digital calibrated scale to the nearest 0.1 kg. Body weight and height were used to calculate body mass index (BMI) of the participants (WHO, 2001).

Data quality Assurance

To assure the data quality, high emphasis was given in designing data collection instrument and questionnaire was formulated from standardized questionnaires. For its simplicity, questionnaire was pre-tested with similar set up and then relevant changes (modifications) were made. Training of data collectors and Supervisor were undertaken.

Data Processing and Analysis

A series of means, standard deviations, and frequency analyzes were conducted on demographic variables and individual subscale items. Scores for each of the subscales were totaled resulting in an overall sexual satisfaction score. Independent samples t-tests were also conducted to assess gender differences and exercise differences on sexual satisfaction. One way ANOVA were computed to determine mean deference between obese and overweight and normal weight hypertensive participants regarding sexual satisfaction. The statistical significance level was established at $p < 0.05$.

Ethical considerations

Ethical clearance was obtained from Jimma Institutional Review Board (IRB) college of Natural science. Permission was obtained from medical director of each selected hospital. Prior to signing on informed consent form, all the participants were understood the benefits associated with participating in the study. Then the study was done with an informed written consent obtained from each participant and their physician. To ensure confidentiality of respondents, their names were not registered on the questionnaire. In addition, hypertensive women and men were informed by female and male interviewers separately and were assured regarding the confidentiality of the information.

RESULTS

Sexual Dysfunction of hypertensive participants

All 845 (100%) selected subjects were not responded for the questioner. Only 811 (95.98%) of hypertensive patients responded to the questioner with a non response rate of 32 (4.02 %). The age of the respondents ranged from 34 to 78 years with mean age and standard deviation of 55.86 + 8.97 year.

The result indicate that hypertensive participants reported that strongly dissatisfied during sex with the frequency of sexual activity (M=1.40, SD=0.595), duration of sexual activity (M=1.41, SD=0.656), energy during sexual activity (M=1.35, SD=0.583) and sexual desire (M=1.32, SD= 0.580). Further analysis showed that, the overall mean score for sexual satisfaction was 1.55 (SD= 0.669). This indicated that, subjects with hypertension decreased their sexual satisfaction (increased sexual dysfunction) during sexual activity (Table-1)

Sexual Dysfunction and Exercise Status

The result found that those who exercised regularly had slightly higher overall satisfaction during sexual activity (M=1.58, SD= 0.595) when compared to those who did not exercise regularly (M=1.52, SD= 0.634). Due to the number of comparisons, Bonferroni adjustments were made that resulted in a critical p value of 0.003 to reduce the risk of inflating type I error rate. There were significant differences between the frequency of sexual activity (t (809) =6.070, p =0.000), such that it was found to be more in regular exercisers (M = 1.46,SD= 0.622) than non-regular exerciser groups (M = 1.15, SD= 0.374); sexually desirable (t(809) =-4.546, p = 0.000), such that it was found to be more in regular exercisers (M = 1.50,SD= 0.643) than non-regular exerciser groups (M = 1.2 , SD= 0.554); and frequency of orgasms (t (809) =3.840, p =0.000), such that it was found to be more in regular exercisers (M =1.73,SD=0.683) than non-regular exerciser groups (M =1.50,SD= 0.582). Therefore, hypertensive patients' participated in regular exercise had an overall positive effect on sexual satisfaction during sexual activity (**Table-2**).

Sexual Dysfunction and Body Mass Index Category

Participants having normal weight had higher overall sexual satisfaction during sexual activity (M=1.63, SD=0.768) than Obese (M=1.54, SD=0.616) and overweight participants (M=1.53, SD=0.626). Within components of sexual satisfaction, there were strong significant differences in the duration of sexual activity f (2) = 4.793, p=0.009, frequency of orgasms f (2) = 5.010, p=0.007, and overall satisfaction f (2) =5.291, p= 0.005, between Normal weight and Overweight and Obese participants. To identify differences between groups, Tukey post-hoc tests revealed that: Participants having normal weight had significantly more duration of sexual activity than Obese and Overweight participants. Obese participants had significantly less sexually satisfying regarding overall satisfaction than overweight and normal weight participants. Participants having normal weight had significantly more frequency of orgasms than over weight and obese participants.

Table 1. Sexual dysfunction during sexual activity among hypertensive adult patients attending in some selected specialized Hospitals of Ethiopia, from October to March 2014/15

Factors of sexual satisfaction	*Mean*	*SD*
Frequency of sexual activity	1.40	0.595
Duration of sexual activity	1.41	0.656
Current body image	1.51	0.621
Self-confidence to perform sex	1.48	0.595
Sexual desire	1.32	0.580
Physical flexibility during sexual activity	1.63	0.638
Physical strength during sexual activity	1.52	0.574
Ability to move and change positions during sex	1.71	0.868
Energy during sexual activity	1.35	0.583
Overall satisfaction with the sexual activity	1.65	0.700
Frequency of your orgasms	1.68	0.670
Intensity of your orgasms	1.48	0.623
Partner's Physical flexibility during sex	1.64	0.648
Partner's Physical strength during sex	1.62	0.608
Partner's ability to move and change positions	1.65	0.543
Partner's Energy during sexual activity	1.77	0.807
Partner's overall satisfaction with the sex	1.48	0.609
Partner's Frequency of orgasms	1.54	0.713
Overall mean score for sexual satisfaction	1.55	0.669

Table 2. Sexual dysfunction by exercise status among hypertensive adult patients attending in some selected specialized Hospitals of Ethiopia, from October to March 2014/15

	Regular Exercise Group		Non- Regular Exercise Group			
Sexual satisfaction Item	*M*	*SD*	*M*	*SD*	*t*	*p*
Frequency of sexual activity	1.46	0.622	1.15	0.374	6.070	0.000
Duration of sexual activity	1.49	0.643	1.39	0.658	-1.679	0.094
Current body image	1.50	0.582	1.52	0.631	0.253	0.801
Self-confidence to perform sex	1.45	0.535	1.49	0.609	0.744	0.457
Sexual desire	1.50	0.643	1.27	0.554	-4.546	0.000
Physical flexibility during sexual activity	1.63	0.658	1.60	0.551	0.531	0.596
Physical strength during sexual activity	1.48	0.501	1.52	0.590	0.795	0.427
Ability to change positions during sex	1.66	0.836	1.73	0.875	0.806	0.421
Energy during sexual activity	1.50	0.593	1.32	0.575	-3.565	0.000
Overall satisfaction with the sexual activity	1.84	0.427	1.61	0.746	-3.878	0.000
Frequency of your orgasms	1.73	0.683	1.50	0.582	3.840	0.000
Intensity of your orgasms	1.45	0.535	1.49	0.643	0.850	0.396
Partner's Physical flexibility during sex	1.76	0.522	1.62	0.673	-2.504	0.012
Partner's Physical strength during sex	1.60	0.551	1.62	0.622	0.327	0.744
Partner's ability to move and change positions	1.81	0.396	1.61	0.567	-4.219	0.000
Partner's Energy during sexual activity	1.69	0.808	1.79	0.806	1.405	0.160
Partner's overall satisfaction with the sex	1.45	0.535	1.49	0.626	0.784	0.433
Partner's Frequency of orgasms	1.50	0.643	1.55	0.729	0.784	0.433

Table 3. Sexual dysfunction by body mass index among hypertensive adult patients attending in some selected specialized Hospitals of Ethiopia, from October to March 2014/15

	Obese		Over Weight		Normal Weight			
Sexual satisfaction Item	*M*	*SD*	*M*	*SD*	*M*	*SD*	*f*	*p*
Frequency of sexual activity	1.37	0.580	1.40	0.561	1.49	0.707	1.761	0.173
Duration of sexual activity	1.38	0.592	1.40	0.630	1.59	0.891	4.793	0.009
Current body image	1.50	0.608	1.50	0.599	1.61	0.712	1.431	0.240
Self-confidence to perform sex	1.46	0.565	1.47	0.584	1.55	0.718	1.059	0.347
Sexual desire	1.31	0.577	1.35	0.599	1.31	0.551	0.357	0.700
Physical flexibility during sexual activity	1.61	0.633	1.61	0.582	1.72	0.759	1.410	0.245
Physical strength during sexual activity	1.51	0.555	1.50	0.548	1.56	0.692	0.433	0.649
Ability to change positions during sex	1.73	0.871	1.66	0.819	1.76	0.953	0.678	0.508
Energy during sexual activity	1.39	0.595	1.35	0.569	1.30	0.609	0.945	0.389
Overall satisfaction with the sexual activity	1.63	0.661	1.61	0.679	1.85	0.854	5.291	0.005
Frequency of your orgasms	1.63	0.640	1.70	0.646	1.85	0.801	5.010	0.007
Intensity of your orgasms	1.47	0.607	1.47	0.584	1.56	0.753	1.009	0.365
Partner's Physical flexibility during sex	1.63	0.634	1.64	0.616	1.72	0.759	0.955	0.385
Partner's Physical strength during sex	1.60	0.593	1.60	0.568	1.71	0.737	1.593	0.204
Partner's ability to move and change positions	1.63	0.523	1.65	0.479	1.73	0.720	1.556	0.212
Partner's Energy during sexual activity	1.77	0.788	1.72	0.754	1.87	0.973	1.394	0.249
Partner's overall satisfaction with the sex	1.47	0.585	1.47	0.570	1.56	0.765	1.161	0.314
Partner's Frequency of orgasms	1.51	0.683	1.55	0.681	1.67	0.869	2.251	0.106

Table 4. Sexual dysfunction by sex among hypertensive adult patients attending in some selected specialized Hospitals of Ethiopia, from October to March 2014/15

	Women		Men			
Sexual satisfaction Item	*M*	*SD*	*M*	*SD*	*t*	*p*
Frequency of sexual activity	1.49	0.617	1.52	0.658	-0.357	0.722
Duration of sexual activity	1.52	0.686	1.55	0.785	-0.025	0.980
Current body image	1.51	0.958	1.57	0.597	0.003	0.998
Self-confidence to perform sex	1.46	0.560	1.51	0.644	-1.377	0.169
Sexual desire	1.53	0.655	1.55	0.733	-0.263	0.792
Physical flexibility during sexual activity	1.68	0.667	1.59	0.617	1.939	0.053
Physical strength during sexual activity	1.49	0.558	1.56	0.595	-1.781	0.075
Ability to change positions during sex	1.76	0.857	1.71	0.897	-0.021	0.983
Energy during sexual activity	1.49	0.617	1.52	0.667	-0.357	0.721
Overall satisfaction with the sexual activity	1.52	0.683	1.53	0.755	-0.116	0.907
Frequency of your orgasms	1.51	0.597	1.53	0.713	-0.653	0.514
Intensity of your orgasms	1.46	0.582	1.52	0.681	-1.433	0.152
Partner's Physical flexibility during sex	1.53	0.664	1.55	0.746	0.147	0.883
Partner's Physical strength during sex	1.60	0.551	1.62	0.622	-1.933	0.054
Partner's ability to move and change positions	1.57	0.644	1.48	0.536	2.321	0.021
Partner's Energy during sexual activity	1.72	0.872	1.72	0.895	0.040	0.968
Partner's overall satisfaction with the sex	1.52	0.686	1.45	0.553	1.606	0.109
Partner's Frequency of orgasms	1.55	0.766	1.53	0..676	0.396	0.692

Therefore, as Body Mass Index of an individual increased, the level sexual satisfaction decreased (**Table-3**).

Sexual Dysfunction and Gender

Result found that men had slightly higher overall sexual satisfaction during sexual activity (*M*=1.56, *SD*=0.721) than women (*M*= 1.54, *SD*= 0.644). To reduce the risk of inflating type I error, Bonferroni adjustments were made at a critical p value of 0.003 for each of the eighteen comparisons. With regard to sexual satisfaction, there were no differences between men and women concerning frequency of sexual activity (*t* (809) =-0.357, *p* = 0.722), duration of sexual activity (*t* (809) =-0.025, *p* =0.980), self-confidence to perform sex (*t* (809)=-1.377, *p* =0.169), sexually desirable (*t* (809)=-0.263, *p* =0.792), current body image (*t* (809) = 0.003, *p* =0.998), ability to move and change positions (*t* (809) = -0.021, *p* =0.983). Men found more sexually satisfying with frequency of sexual activity (*M*=1.52, *SD*=0.658), duration (*M*=1.55, *SD*=0.747), self-confidence to perform sex (*M*=1.51, *SD*=0.644), sex desirability (*M*=1.55, *SD*=0.733), current body image (*M*=1.57, *SD*=0.597) and ability to move and change positions (*M*=1.76, *SD*=0.857) than women (*M*=1.49, *SD*=0.617), (*M*=1.52, *SD*=0.686), (*M*=1.46, *SD*=0.560), (*M*=1.53, *SD*= 0.655), (*M*=1.51 , *SD*=0.958) and (*M*=1.71, *SD*=0.897) respectively (Table-4).

DISCUSSION

Our findings indicate that subjects with hypertension decreased their sexual satisfaction (not happy) during sexual activity. A possible explanation for this might be due to differences in age distribution, duration of hypertension and the antihypertensive drugs used by the study patients. The current finding is consistent with other research which found that low level sexual satisfaction is a common problem among aging hypertensive patients and the prevalence increases with age (Rosen *et al*., 2004). Supporting this, the finding is in agreement with the study of Tsitouras and martin (1982) who reported a progressive decline in the frequency of sexual intercourse with advancing age. Diseases may greatly alter the sexuality of an individual and many systemic diseases reduce testosterone leading to a decrease in libido. So, Jensen *et al*. (1999) *point out* that the main reason for sexual dissatisfaction among hypertensive individuals were penile circulation disability, probably due to atherosclerosis. In addition, atherosclerosis in hypertensive women also lowers vaginal lubrication, less frequent orgasms, and more frequent pain.

Sexual Satisfaction and Exercise

Supporting the hypothesis, the current study found that levels of sexual satisfaction higher during sexual activity among hypertensive adult are who exercised regularly than did not exercise regularly. A possible justification for this finding might be; due to the beneficial effects of regular physical exercise which attenuate the development of erectile dysfunction by enhancing nitric oxide bioavailability (Claudino *et al*., 2011). Supporting this, regular physical activity has been linked to improved cardiovascular function; this improves blood flow to both male and female genitalia which is required for healthy sexual function and orgasm (Karatas *et al*., 2009). Thus finding from this study support the notion that improved blood flow leads to improved sexual satisfaction as a result of physical activity. Therefore, if individuals are gaining to decrease their sexual dysfunction, a possible solution could be to exercise regularly.

Sexual Satisfaction and Body Mass Index

Supporting the hypothesis, the present study found that levels of sexual satisfaction higher among hypertensive adults having

normal weight as compared to overweight and obese hypertensive adults. This study seems to be consistent with other study which found that individuals with a lower body mass index had higher levels of self-attractiveness (Haavio-Mannila and Purhonen, 2001). This indicates that individuals with a normal weight (lower BMI) feel more attractive & therefore have increased levels of sexual satisfaction. In addition, study also indicates that increasing severity of obesity is associated with greater impairment in sexual quality of life or experience greater sexual difficulties (Kolotkin *et al*., 2006). Therefore, higher prevalence of sexual problems in subjects with obesity was associated with problems in arousal, lubrication, orgasm, sexual desire and overall satisfaction (Esposito *et al*., 2007). A possible explanation for this might be that, obesity similar to other cardiovascular risk factors is associated with the development of male and female sexual dysfunctions resulting from the deleterious effects on vascular and endothelial functions (Berman and Bassuk, 2002).

Sexual Satisfaction and Gender

Supporting the hypothesis, the current study found that the level of sexual satisfaction higher among hypertensive men than hypertensive women during sexual activity. Several possible reasons for this might be due to gender socialization, each gender has different expectations regarding appropriate sexual behavior. Study showed that women are more reserved in the culture and are less likely to discuss such sensitive subjects. Therefore, sexual satisfaction likely impact negatively (United States Department of Health and Human Services, 2000b). The second possible reason might be hypertensive females associated with being in postmenopausal status. This indicate that low sexual activity for females might be the result of declining estrogen and testosterone levels which affecting sexual desire and difficulty in achieving orgasm (Addis *et al*., 2006). The other possible reason might be hypertensive women are often unable to reach climax due to premature ejaculation by men (Wikipedia Encyclopedia, 2005). This may indicate that men are satisfied with their orgasm frequency because they achieve an orgasm more often than women. Supporting this, one study found that gender differences in sexual intercourse experiences men were more likely to have an orgasm than women (Sprecher *et al*., 1995).

Conclusion

Subjects with hypertension had low sexual satisfaction (dissatisfied) mainly with the frequency of sexual activity, duration of sexual activity, energy during sexual activity, frequency of orgasms and overall satisfaction. Hypertensive patients participated in regular physical activity had higher level of sexual satisfaction than those did not participate in regular physical activity. Furthermore, Normal weight hypertensive patients had higher level of sexual satisfaction than obese and overweight hypertensive patients. However, hypertensive women had lower level of sexual satisfaction than hypertensive men. Based on the finding of the study, the following recommendations: - For those obese and overweight hypertensive people, the benefits of weight loss to improve sexual life may be a way to motivate them to start and continue a special nutritional and physical activity program. Practitioners should be aware of the wide variation in sexual side effects produced by antihypertensive agents and to be willing to discuss potential occurrence of these problems with hypertensive patients. Finally, effective information, education and communication strategies on sexual satisfaction for hypertensive patients should be designed and strengthened to raise their awareness and modify or change their life style behavior.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

TG developed the concept and designed the study. TG performed all practical aspects of the study. TG and SM analyzed and interpreted the data. TG and SM drafted the manuscript. TG and SM revised the manuscript for intellectual content. All authors read and approved the final manuscript.

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