

ORIGINAL ARTICLE

An assessment of self-perceived health status of patients of diabetes mellitus, hypertension and comorbidity using physical functioning

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Abstract

Introduction: Perceived health is a subjective assessment of the health and includes so many aspects that are difficult to capture clinically such as incipient disease, disease severity, physiological, psychological reserves and social functions. **Aims & Objective:** To assess the impact of Diabetes Mellitus, Hypertension, comorbidity and other associated factors on the physical functioning of the patients attending the Outpatient department (OPD), Inpatient department (IPD), Rural Health Training Centre (RHTC) and Urban Health Training Centre (UHTC) of Shri Ram Murti Smarak Institute of Medical Sciences (SRMS,IMS), Bareilly. **Methods:** Perceived health status of the patients was assessed by the Physical Functioning (PF) dimension of the Physical Component Summary using the 36-item short form health survey (SF-36). **Results:** The presence of both Diabetes Mellitus and Hypertension was associated with lower Physical Functioning scores compared to those with diabetes and hypertension alone ($p > 0.05$). Age was inversely related with Physical Functioning scores ($p < 0.05$) but male gender ($p < 0.000$) and higher income ($p < 0.05$) were all associated with higher Physical Functioning scores. There was not so much influence of geographical area on the Physical Functioning scores and the association was found to be insignificant ($p > 0.05$). **Conclusions:** The presence of Comorbidity was found to have greater impact on Physical Functioning compared to individual disease. The impact of various socio-demographic characteristics on the perceived health status was also evident in the study. However, the results were interpreted in terms of the study's limitations.

Key Words

Self-perceived health; Physical Functioning; Diabetes Mellitus; Hypertension; Co-morbidity

Introduction

India is going through a period of transition, both epidemiological as well as demographic and there is an increasing prevalence of Non Communicable Diseases (NCDs) as a result of industrialization, socio-economic development, urbanization, changing lifestyles and dietary habits, thereby resulting in a growing burden of NCD's.[1] NCDs are a leading cause of deaths both in developing and developed countries, nearby two out of every three deaths on the planet are now attributed to NCDs. United Nations (UN) estimates that by 2030, 52 million people will die annually due to NCDs i.e. five times as many deaths as the estimated deaths toll for infectious diseases.[2] These diseases like Hypertension, Diabetes Mellitus not only

deteriorates objective health but also influence one's perception of health which is known as Self Perceived Health (SPH).[3,4]

Perceived Health is subjective or self-assessment of their health and includes many aspects that are difficult to capture clinically, such as incipient disease, disease severity, physiological and psychological reserves and social functions. Till now more emphasis was given to the objective health by policy planners and health care providers but now there is a need to assess the subjective health also because it is strong, independent and reliable indicator of mortality as well as morbidity as shown by many studies. There are few such type of studies in India, none in the Uttar Pradesh region. Hence it

was planned to carry out this study to initiate an innovative & inexpensive approach.

Aims & Objectives

To assess the impact of Diabetes Mellitus, Hypertension, Co-morbidity and of various socio demographic factors on physical functioning of patients.

Material and Methods

This Facility based Cross-sectional Observational study was conducted among registered subjects of Diabetes mellitus (DM), Hypertension (HTN) and Comorbid (DM+HTN) patients aged ≥ 35 years attending the OPD, IPD, RHTC and UHTC of Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly. The sample included all Patients aged 35 years and above suffering from Diabetes Mellitus, Hypertension or with comorbidity for more than 6 months, who attended the OPD, IPD, RHTC and UHTC of SRMS, IMS during the study period from 1st June 2012 – 31st May 2013. So, a total of 1130 subjects participated in the study after considering the exclusion criteria i.e. patients Suffering from DM/HTN for less than 6 months, Age < 35 years, Type 1 DM, Gestational DM, Impaired Glucose Tolerance (IGT).

Two Forms were used to collect the required data. The first was a checklist containing items of socio-demographic and other epidemiological correlates. The second was Hindi translated and patient friendly modified version of RAND SF-36 questionnaire, used to assess the physical functioning. It included 10 items under physical functioning dimension of Self Perceived Health. Weightage was given for each question according to response i.e. 0 for worst and 100 for best performance, then the average score was calculated of all 10 questions which is the average physical functioning score of individual patient.

Analysis was performed using SPSS version 20.0 and stat Direct Ltd version 2-70-800 software with level of significance set at 0.05. Chi-square test was applied wherever applicable.

Results

A total of 1130 subjects participated in the study in which the rural–urban distribution revealed rural preponderance as majority of the subjects belong to rural area (53%) compared to urban (47%).

[Table 1](#) shows the distribution of study subjects according to the age and sex. A total of 1130 subjects participated in the study. It was observed that out of

1130 subjects, majority (63.7%) were of non-geriatric age group (< 60 years) while 36.3% belonged to geriatric age group. It is evident from [table 2](#) that out of the 1130 total subjects, majority (55.5%) had dual disease (DM +HTN) while 30.6% had Diabetes mellitus and 13.9% had only hypertension. The male preponderance was evident in Diabetes and Dual disease (64.5% and 56.9% males respectively) as against 35.5% and 43.0% females respectively while in case of hypertensives, situation was reverse i.e. females were in majority (51.6%) compared to males (48.4%).

[Table 3](#) shows the Physical functioning score of the subjects according to age, sex and geographical distribution. An inverse relationship was observed between age and physical functioning score with majority of the subjects (73.2%) aged < 60 years scoring > 50 i.e. good and excellent score. Majority of males (71.0%) scored > 50 compared to 59.7% of females who scored greater than 50. There was no significant impact of geographical area on physical functioning as evident by insignificant results obtained on statistical analysis. The influence of BMI on PF average score in excellent group as 37.1% of respondents in normal BMI category obtained excellent score of PF whereas only 26.83% of underweight respondents could reach this grade of scoring. [\[Table 4\]](#)

[Table 5](#) shows that maximum respondents were in excellent category of PF average score followed by good and fair scorers but trend is slightly different in upper SES in which excellent scorers followed by fair and good scorers of average PF Score was observed. It was also observed that the influence of SES on PF score achievement was evident, as the majority (74.1%) respondents from upper, upper middle and lower middle class scored > 50 while in lower & upper lower only 64.6% achieved this score and figure was opposite in case of average scoring < 50 , 25.8% and 35.4% respectively.

On comparing the respondents by morbidity (DM, HTN or DM+HTN) and PF score, it was observed that overall majority were those subjects who had either DM or dual morbidity in all score categories as compared to those who had HTN alone. It was further observed that the subjects who had either DM or dual morbidity, male preponderance was found as compared to female which was contrary to Hypertensives and this difference was insignificant statistically. On comparing the comorbidity with either DM or HTN, comorbid Subjects scored poor, in case of DM 66.8% scored > 50 as compared to

comorbid 63.6% and in case of HTN 75% scored >50 (Table-6).

Discussion

In the present study, age significantly influenced the Physical Functioning (PF) dimension of Physical Component Summary (PCS). As the age advanced, the score decreased. Similar findings was obtained in a study by Wang et al [3] and Joshi et al [4]. Baert et al [5] also reported in their study carried out in 25 European Countries that age inversely influenced the Physical Functioning.

In present study the relationship between PF and sex was found to be significant ($p < 0.05$). Gender influence was evident as average score for PF was better achieved by males as compared to females. Similar findings were also observed in various other studies. [6,7]

The impact of BMI on Physical Functioning was found to be significant ($p < 0.05$) on applying non-parametric test. Normal weight subjects scored better for PF as compared to underweight and overweight/obese, matching with findings of study done by Jonnalagadda et al [8] and Mandhari et al. [9] Average PF score was found to be significantly associated with Socioeconomic Status. The subjects belonging to lower class in present study scored poorly for Physical Functioning. The findings of this study correlate with other studies. [9,10]

In present study, there was no significant influence of geographical area for PF but rural subjects scored slightly better for PF which was quite unusual. Grigoriev et al [11] in his study in Belarus city of Russia also depicted such results. On the contrary Bakshi et al [12] and Babones et al [13] in their study reported that individuals residing in rural area are less likely to perceive their health as good or excellent as compared to their urban counterparts. In the study, the impact of morbidity either due to DM or HTN alone or co-morbidity (DM+HTN) was found to be insignificant for PF dimension. Previous studies [14, 15] also depicts that either Diabetics or Hypertensives scored poor as compared to normal subjects.

Conclusion

Male patients from the Younger age group with normal BMI and belonging to higher socioeconomic status performed better score for PF and their association were significant, while geographical area and morbidity had insignificant impact on PF. SPH is considered to be a predictive variable of one's own morbidity and mortality and is an inexpensive and

non-interventional method which is presumed to be far better than physician's evaluation as depicted by literature review on the topic.

Recommendation

The present study provides preliminary understanding of the factors influencing the SPH in this country with enormous socio cultural diversities, further longitudinal studies should be planned to explore more qualitative as well as quantitative data and other related variables to provide better insight into the factors that hinder or promote health and wellbeing. There is a need to frame a policy to include the subjective part of health in all health related studies because it is simple, inexpensive and more valuable than physician's evaluation.

Limitation of the study

Due to paucity of literature & research being done on SPH in India, I had to compare my results with foreign studies.

Relevance of the study

This is new study carried out to focus the researcher's attention towards subjective part of health which has remained neglected since long. Also, not many studies have been carried out on this subject in India, so it was an initiative taken on the part of the author to study this topic and also encourages other authors to explore and develop a modified version of the study questionnaire i.e. SF-36 to be used in Indian context.

Authors Contribution

SKS: Concept Design, Literature search, Data collection, Acquisition of data and analysis. DI: Manuscript drafting and revising it critically for important intelligent content. JPS: Literature Search. SBG: Drafting and revising. VPS: Manuscript drafting and revising it critically for important intelligent content.

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Tables

TABLE 1 DISTRIBUTION OF SUBJECTS ACCORDING TO AGE AND SEX

Age group (yrs)	Male		Female		Total	
	n	%	n	%	n	%
35-40	78	57.3	58	42.7	136	12.0
40-45	71	55.4	57	44.6	128	11.3
45-50	86	51.5	81	48.5	167	14.8
50-55	111	62.7	66	37.3	177	15.7
55-60	68	60.7	44	39.3	112	9.9
>60	242	59.0	168	41.0	410	36.3
Total	656	58.0	474	42.0	1130	100.0

TABLE 2 DISTRIBUTION OF SUBJECTS ACCORDING TO SEX & MORBIDITY PATTERN

Morbidity	Male		Female		Total	
	n	%	n	%	n	%
Diabetes	223	64.5	123	35.5	346	30.6
Hypertension	76	48.4	81	51.6	157	13.9
DM+HTN	357	56.9	270	43.1	627	55.5
Total	656	58.0	474	42.0	1130	100.0

TABLE 3 PHYSICAL FUNCTIONING SCORING OF SUBJECTS ACCORDING TO AGE, SEX & GEO. AREA

Variables	0-25 (Poor)		25-50(Fair)		50-75 (Good)		75-100 (Excellent)		Total
	n	%	n	%	n	%	n	%	
Age Group									
35-40	8	5.9	16	11.8	39	28.7	73	53.6	136
40-45	11	8.6	24	18.7	37	28.9	56	43.8	128
45-50	12	7.2	32	19.2	54	32.3	69	41.3	167
50-55	20	11.3	36	20.3	51	28.8	70	39.6	177

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55-60	11	9.8	23	20.5	34	30.4	44	39.3	112
>60	82	20.0	106	25.9	140	34.1	82	20.0	410
Total	144	12.7	237	21.0	355	31.4	394	34.9	1130
$\chi^2 = 113, df = 15, p = 0.000$									
Sex									
Male	72	11.0	118	18.0	205	31.2	261	39.8	656
Female	72	15.2	119	25.1	150	31.6	133	28.1	474
Total	144	12.7	237	21.0	355	31.4	394	34.9	1130
$\chi^2 = 21.3, df = 3, p = 0.000$									
Geographical Area									
Urban	64	12.0	111	21.0	180	33.9	176	33.1	531
Rural	80	13.4	126	21.0	175	29.2	218	36.4	599
Total	144	12.7	237	21.0	355	31.4	394	34.9	1130
$\chi^2 = 3.19, df = 3, p = 0.363$									

TABLE 4 PHYSICAL FUNCTIONING SCORING OF SUBJECTS ACCORDING TO BMI

Variables	0-25 (Poor)		25-50(Fair)		50-75 (Good)		75-100 (Excellent)		Total
	n	%	n	%	n	%	n	%	
BMI									
Underweight	8	19.5	7	17.1	15	36.6	11	26.8	41
Normal weight	94	14.7	117	18.3	191	29.9	237	37.1	639
Overweight	31	10.3	78	25.9	103	34.2	89	29.6	301
Obese	11	7.4	35	23.5	46	30.9	57	38.2	149
Total	144	12.7	237	21.0	355	31.4	394	34.9	1130
$\chi^2 = 20.8, df = 9, p = 0.014$									

TABLE 5 PHYSICAL FUNCTIONING SCORING OF SUBJECTS ACCORDING TO SOCIO-ECONOMIC STATUS

Variables	0-25 (Poor)		25-50(Fair)		50-75 (Good)		75-100 (Excellent)		Total
	n	%	n	%	n	%	n	%	
SES									
Upper	3	16.7	5	27.8	2	11.1	8	44.4	18
Upper middle	3	4.6	7	10.8	23	35.4	32	49.2	65
Lower middle	12	10.5	21	18.4	34	29.8	47	41.3	114
Upper lower	24	10.9	35	15.9	58	26.4	103	46.8	220
Lower	102	14.3	169	23.7	238	33.4	204	28.6	713
Total	144	12.7	237	21.0	355	31.4	394	34.9	1130
$\chi^2 = 43.3, df = 12, p = 0.000$									

TABLE 6 PHYSICAL FUNCTIONING SCORING OF SUBJECTS ACCORDING TO MORBIDITY

Variables	0-25 (Poor)		25-50(Fair)		50-75 (Good)		75-100 (Excellent)		Total
	n	%	n	%	n	%	n	%	
Morbidity									
DM	41	11.8	74	21.4	107	30.9	124	35.9	346
HTN	12	7.6	26	16.6	63	40.1	56	35.7	157
DM+HTN	91	14.5	137	21.9	185	29.5	214	34.1	627
Total	144	12.7	237	21.0	355	31.4	394	34.9	1130
$\chi^2 = 11.4, df = 6, p = 0.076$									