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# 25 Hydroxyvitamin D levels, quality of life, and disability in long-standing patients of somatization

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## Abstract

### Introduction:

Somatization disorder is a debilitating condition, in which patients have multiple physical complaints with no explained cause and no relief even after consultations.

### Aim:

The present study examined the association of 25-hydroxyvitamin D (25[OH]D) levels, quality of life, disability, and symptom profile in long standing with somatization disorder.

### Methods:

One-hundred three patients of somatization disorder suffering for ≥2 years, visiting psychiatry outpatient clinic during two consecutive summer season (April to June) of 2015–2016 were recruited. Symptom profile was studied using Patient-Health-Questionnaire (PHQ-15) items (somatic symptoms), PHQ-9 items (depressive symptoms), Generalized Anxiety Disorder-7 (GAD-7) item (anxiety symptoms).quality of life was assessed using the World Health Organization Quality of Life BREF 26 item, and disability measure was World Health Organization Disability Assessment Schedule (WHODAS) 2.0. 25(OH) D levels were estimated using chemiluminescence binding assay.

### Results:

The poor quality of life in somatization disorder was significantly associated with disability, symptom profile using PHQ-15, PHQ-9, and GAD-7. 25(OH)D levels were deficient in 56.31% of the study population.

### Conclusion:

The high somatic symptom severity in majority of patients suffering from somatization disorder needs more attention from psychiatrists across cultures so that functional status and quality of life can be improved. Routine estimation of Vitamin D levels and correction of its deficiency may bring about symptomatic relief at an early stage, thereby reducing the morbidity associated with the disorder.

**Keywords:** Disability, quality of life, somatization, Vitamin D deficiency

Somatization disorder is a clinical condition, in which patients have multiple physical complaints with no explained cause and no relief even after consulting a number of physicians.[1] It is a disabling condition,[2] commonly presenting in general hospital clinics, with point prevalence as high as 10%–16%.[3,4]

Somatization disorder causes more functional impairment than physical as compared to other medical disorders.[2,5] Depressive and anxiety symptoms are commonly associated with somatization disorder and lead to disability.[2,6] Somatization disorders are characterized by frequent use of medical services with poor response to treatment, follow a chronic course, cause significant disability, caregiver burden,[5,6,7,8] and poor quality of life.[9,10] There are very few studies on pain disorders that had assessed the response to Vitamin D supplementation in a small sample of patients.[11,12] The present study was undertaken to overcome the lacunae in the existing literature on clinically relevant aspects of somatization disorder. Therefore, the present study was carried out to examine 25-hydroxyvitamin D (25[OH]D) levels, quality of life, disability and symptom profile in long-standing patients with somatization disorder.

## METHODS

This cross-sectional study was carried out in the psychiatry department of a tertiary care hospital in the capital city of Delhi. Patients between age group 18 and 60 years with multiple somatic complaints and on treatment for two or more years were screened. Those fulfilling the diagnostic criteria of somatization disorder, according to the International Classification of Diseases, tenth revision, Diagnostic criteria for Research and those who were willing to participate in the study, were recruited. The study was completed over a period of two consecutive summer seasons (April to June) of 2015–2016. Those patients with comorbid significant, unstable medical disorder or surgical illness, pregnancy, current substance use, and psychotic disorders were excluded from the study. One hundred and eighty patients were initially screened. A total of 67 patients were excluded due to medical or surgical problems and 10 patients refused consent. Finally, 103 patients were included in the study protocol which was approved by the Institutional Ethics Committee.

### Tools

1. Sociodemographic pro forma: The sociodemographic details of the patients who gave written informed consent were recorded using a semi-structured pro forma
2. Kuppuswamy's socioeconomic status scale: The socioeconomic status was assessed using Kuppuswamy's socioeconomic status scale.[13] It includes the following three parameters: education status of head of family, occupation of head of family, and monthly family income
3. World Health Organization Quality of Life (WHOQOL–BREF) is a 26 item tool used to assess quality of life in four domains: Physical, psychological, social and environmental and has been validated cross culturally and in Indian population[14,15,16]
4. World Health Organization Disability Assessment Schedule (WHODAS) 2.0 is a practical, generic assessment instrument used to measure health and disability in clinical practice. WHODAS 2.0 assesses the level of functioning in six domains of life i.e., cognition, mobility, self-care, getting along, life activities, and participation. Test–retest reliability of WHODAS 2.0 is 0.98 at overall

level[17]

5. Patient-Health-Questionnaire (PHQ-15) is a somatic symptoms severity scale. It screens for 15 somatic symptoms that account for more than 90% of the physical complaints reported in the outpatient setting. The PHQ-15 is a valid measure in different healthcare settings. It has 15 items, each of which is scored 0–2, providing a minimum score of 0 and a maximum score of 30[18]
6. PHQ-9 is a very specific, sensitive, and validated tool for screening of depression. It has nine items, each of which is scored 0–3, providing a minimum score of 0 and a maximum score of 27[19]
7. Generalized Anxiety Disorder-7 (GAD-7) was initially developed to screen GAD. It is also reported to have good sensitivity and specificity as a screening instrument for other anxiety disorders i.e., panic, social anxiety, and posttraumatic stress disorder and has also been validated in these conditions. It has seven items, each of which is scored 0–3, providing a minimum score of 0 and a maximum score of 21[20]
8. 25(OH)D levels were carried out by chemiluminescence binding assay using Elecsys, 2010, Roche (Germany), Diagnostics on a fasting sample. The 25(OH)D levels were categorized as: deficient <20 ng/ml, insufficient 21–29 ng/ml, sufficient 30–100 ng/ml according to clinical guidelines.[21]

### Statistical analysis

The analysis was done using the Statistical Package for the Social Sciences for windows, Version 20.0 (IBM SPSS Inc., Chicago, IL) to analyze the data. Descriptive statistics were used for sociodemographic data. Vitamin D levels, quality of life, disability was assessed using mean and standard deviation (SD) in all the four domains: physical, psychological, social and environmental of WHOQOL–BREF and general disability scores on WHODAS. Pearson correlation was applied to correlate the scores of WHOQOL–BREF in four domains, Vitamin D levels, WHODAS 2.0 general disability scores, the somatic symptoms severity scores (PHQ-15), depressive symptoms scores (PHQ-9), and anxiety symptoms score (GAD-7).

## RESULTS

Sociodemographic statistics revealed that there were six males (5.82%) and 97 females (94.16%); mean (SD) age was 43.69 (±10.01) years. Nearly 49 (47.57%) were illiterate, 91 (88.34%) married, and 84 (81.55%) were homemakers. On socioeconomic status scale, 3 (2.9%) patients belonged to upper status, 56 (54.4%) to upper middle class, 22 (21.4%) to the upper lower, 20 (19.4%) to the lower middle, and 2 (1.9%) to the lower socioeconomic class. Seventy-eight patients (75.72%) belonged to urban background, and 25 (24.27%) were from rural area. Mean duration of illness of Somatization Disorder was 4.9 years.

Among the participants, 58 patients were deficient in 25(OH) D levels (<20 ng/ml), insufficient in 26 patients (21–29 ng/ml), and sufficient in 19 patients (30–100 ng/ml) as shown in Table 1.

On PHQ-15, only 18 patients had somatic symptoms in minimal to low levels as noted. Twenty-nine patients had medium level of somatic symptoms, and 53 patients had severe somatic symptoms. Mean scores on PHQ-15, PHQ-9, and GAD-7 are given in Table 2.

Mean score for all the four domain scores of WHOQOL–BREF were as follows: the mean score of physical health domain was 18.22 (SD = 6.22), mean score of psychological health domain was 15.52 (SD = 4.83), mean score of social domain was 8.45 (SD = 2.77) and that of environment domain was 22. 13 (SD = 5.51) Table 3. Disability assessment using WHODAS 2.0 revealed mean disability score of 1.88 (SD = 0.700).

Table 4 shows the correlation of WHOQOL–BREF scores and WHODAS 2.0 with clinical symptoms variables. Statistically significant negative correlation was found between all the four domains physical, psychological, social and environment with the symptom profile on PHQ-15 (somatic symptoms), PHQ-9

(depressive symptoms), and GAD-7 (anxiety symptoms). Disability scores had statistically significant positive correlation with PHQ-15 (somatic symptoms), PHQ-9 (depressive symptoms), and GAD-7 (anxiety symptoms). No correlation was found between 25(OH)D levels, quality of life domains, and disability scores.

## DISCUSSION

The results of our study revealed that poor quality of life is significantly associated with disability and clinical symptoms in somatization disorder. In this study, most of the patients were married females. The severity of somatic symptoms, depression, and anxiety were very significant even after years of treatment. Somatization disorders follow a chronic course. The treatment response is poor and is associated with poor quality of life and considerable disability.[22] A randomized controlled trial of brief training in the assessment and treatment of somatization in primary care has earlier shown that the overall self-reported health changes in patients with Somatization were small during 1-year follow-up.[23] Training of physicians was associated with no significant improvements in satisfaction with care. No statistically significant effect was found with regard to patients' physical function, quality of life, disability days, or somatization after 1-year follow-up.[23]

Severe somatic symptoms were recorded in 51.45% of the patients in our study. Correlation analysis has shown that somatic symptoms, anxiety, and depressive symptoms independently correlate negatively with quality of life and positively with disability scores. Earlier studies by Kushwaha *et al*.[6] using the Indian Disability Evaluation and assessment scale and Chadda *et al*.[22] using Global Assessment of Functioning and Dysfunctional analysis Questionnaire have shown similar results that the functional impairment and disability in these patients are significant. Symptom severity remains the major factor in contributing to disability in somatization disorder. Majority of the patients had comorbid anxiety and depressive symptoms which may also contribute significantly to functional impairment.

Estimation of 25(OH)D levels revealed deficient levels in 56.31% of our study population, who were then advised to take Vitamin D (cholecalciferol) 60,000 IU once a week for 3 months.[24] All the patients were counseled for daily sunlight exposure for ½ h during morning hours of 11:00 AM–2:00 PM in the afternoon. In a recent compilation of data from several Indian studies, Vitamin D deficiency ranged from 34% to 100% in different regions across several population groups from India.[25] Endocrine society Clinical Practice Guidelines recommend minimum daily allowances of Vitamin D which are as follows: infants and children (0–1 year) 400 IU/day, children above 1 year and adults (19–50 years, 50–70 years) 600 IU/day, adults (70 years and above) require at least 800 IU/day.[21]

Adequate sunlight exposure, food fortification, consumption of animal foods, and supplementation are the strategies highlighted to overcome Vitamin D deficiency in South Asian population.[26] Although we could not establish any correlation between 25(OH)D levels and quality of life or disability, a longitudinal study needs to be conducted to find out the effect of Vitamin D supplementation in somatization disorder.

The somatization disorders remain at low-priority area of research in psychiatry.[2] The impact of Vitamin D levels on the symptom profile of psychiatric disorders has been scarcely studied. In a previous pilot study carried out by the authors in the year 2013 on psychiatry outpatients ($n$ = 120) from Delhi, 92 patients (82.14%) had Vitamin D deficiency.[27] Recently, a study had found severe deficiency in therapy-refractive schizophrenia.[28]

## CONCLUSION

Somatization disorder runs a chronic course with significant effect on quality of life and leads to disability. 25(OH)D levels are found deficient in about half of the study sample. This is one of few studies which had correlated quality of life and disability with somatic, anxiety, and depressive symptoms. To the best of the

knowledge of authors, this is the first study that has evaluated 25(OH)D levels in long-standing patients of somatization disorder. The high somatic symptom severity in majority of patients needs more attention from psychiatrists across cultures so that functional status and quality of life can be improved. Routine estimation of Vitamin D levels and correction of its deficiency may bring about symptomatic improvement in the patients at an early stage, thereby reducing the morbidity.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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## Figures and Tables

**Table 1**

Vitamin D levels in somatization disorder (*n*=103)

| Vitamin D levels | *n* (%) |
|---|---|
| Deficient (<20 ng/ml) | 58 (56.31) |
| Insufficient (21-29 ng/ml) | 26 (25.24) |
| Sufficient (30-100ng/ml) | 19 (18.44) |
| Intoxication (>100) | 0 (0) |

**Table 2**

Mean scores on patient-healthquestionnaire 15, patient-health-questionnaire 9 and generalized anxiety disorder seven in somatization disorder (*n*=103)

| Symptom profile (*n*=103) | Mean±SD |
|---|---|
| PHQ-15 somatic symptoms | 14.69±6.28 |
| PHQ-9 depressive symptoms | 12.33±7.91 |
| GAD 7 anxiety symptoms | 9.10±5.95 |

PHQ – Patient-health-questionnaire; GAD – Generalized anxiety disorder; SD – Standard deviation

**Table 3**

Mean scores on quality of life (the World Health Organization quality of life -BREF) domain scores and disability (the World Health Organization disability assessment schedule 2.0) scores in somatization disorder (*n*=103)

| Variable | Mean±SD |
|---|---|
| WHOQOL - BREF | |
| Physical domain | 18.22±6.22 |
| Psychological domain | 15.52±4.83 |
| Social domain | 8.45±2.77 |
| Environmental domain | 22.13±5.51 |
| WHO DAS 2.0 general disability score | 1.88±0.700 |

WHOQOL – World Health Organization quality of life; SD – Standard deviation; DAS – Disability assessment schedule

## Table 4

Correlation between quality of life (World Health Organization quality of life - BREF) domain scores, disability (World Health Organization disability assessment schedule 2.0) scores with symptom profile, Vitamin D levels in somatization disorder patients (*n*=103)

| | Age | WHO QOL- BREF physical domain | WHOQOL- BREF psychological domain | WHOQOL- BREF social domain | WHOQOL- BREF environmental domain | WHO DAS 2.0 |
|---|---|---|---|---|---|---|
| PHQ-15 | | | | | | |
| Pearson correlation | 0.065 | −0.577* | −0.500* | −0.400* | −0.442* | 0.591* |
| Significant (two-tailed) | 0.515 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| PHQ-9 | | | | | | |
| Pearson correlation | 0.160 | −0.671* | −0.579* | −0.462* | −0.527* | 0.724* |
| Significant (two-tailed) | 0.107 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| GAD7 | | | | | | |
| Pearson correlation | 0.119 | −0.634* | −0.568* | −0.437* | −0.530* | 0.605* |
| Significant (two-tailed) | 0.231 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Vitamin D levels | | | | | | |
| Pearson correlation | 0.047 | −0.108 | −0.153 | −0.112 | −0.108 | 0.044 |
| Significant (two-tailed) | 0.639 | 0.276 | 0.123 | 0.259 | 0.279 | 0.660 |

*Correlation is significant at the 0.05 level (two-tailed). WHOQOL – World Health Organization quality of life; SD – Standard deviation; DAS – Disability assessment schedule; PHQ – Patient-health-questionnaire; GAD – Generalized anxiety disorder; SD – Standard deviation