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Nutritional Supplements and its Effect on Quality of Life and Sleep

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Abstract: Problem statement: Inadequate sleep has been recognized as a risk factor for poor health status. Mental stress, body pains, melatonin deficiency, late night awakening disturbing the body clock are triggers for poor quality of sleep and fatigue. Fatigue due to insomnia is a major cause for poor quality of life. Evidences suggest certain nutrients to exert profound influence on quality of sleep which in turn could affect quality of life. In the present study we examine to study the effects of food and nutrients on sleep and quality of life. **Approach:** 800 subjects were screened for sleep quality and presence of insomnia out of which, 34 subjects of both sexes aged 21-45 years included for the "Nutrition Intervention Study". Nutrients and food components were assessed by three days Diet Diary Method and Sleep quality was assessed by Sleep Behavior and Insomnia Screening Questionnaire (ISQ) as well as the Pittsburgh sleep quality index**.** Blood and urine parameters were examined by standard methods. A pre-post assessment method was adopted. Subjects were assessed for blood parameters like-serum cortisol, vitamin B12, ferritin, iron and magnesium; urine profile included was pH and Sp.Gr. Intervention period was 15 days and subjects were divided in to three groups depending upon criteria of diagnosis, i.e., Gr.1, subjects (n = 12) with low serum B12 levels, who were given B12 injections. Gr. 2(n = 12) and Gr. 3: (n = 10) subjects respectively were provided with beet root and poppy seeds drinks to be consumed every night (4 h before bed time). **Results:** Beet root consumption increased the ferritin level. B12 level increased significantly with beet root powder intervention. B12 supplementation effectively increased (from 152.87±23.9-1375.6±804.4 pg mL^{-1}) serum levels of this vitamin and the difference was extremely significant statistically ($p<0.01$). It was highly encouraging to note a significant reduction in cortisol levels with B12 supplementation within a period of 15 days. Mean value of ferritin increased after poppy seed intervention; this improvement can be attributed to the iron content of poppy seed. A decrease in serum cortisol level was also noted, the mean levels before and after intervention being 16.6±3.4-11.7±2.5 mcg dL^{-1} affect a mean reduction of 4.9 mcg dL^{-1}, although a striking difference was observed, it was statistically not significant. The maximum improvement in insomnia was found with poppy seed drink (63.6%) followed by beet root drink and B12 supplementation which varied from 54.6 and 33.4% respectively. Improvement of anxiety as a factor affecting insomnia was noted in 20% of subjects in B12 and 66.6% in beetroot drink supplementation groups. It was encouraging to witness a 100% improvement in the group with poppy seed intervention. Significant improvement was noted in the Circadian rhythm disorder in all intervention groups Parasomnia and Restless Leg Syndrome (RLS) recovery was seen in all the intervention groups while highest proportion RLS improvement was noted in B12 group. (Please give data) Significant improvement was seen in sleep quality among all the intervention groups administered either vitamin B12, or beet root or poppy seeds. Marked reduction in co-morbid symptoms like fatigue, memory function and improvement in scores for quality of life was observed. **Conclusion:** Nutritional supplements appear to be effective in improving sleep quality which might influence quality of life.

Key words: Restless Leg Syndrome (RLS), Insomnia Screening Questionnaire (ISQ), Analysis of Variance (ANOVA), powder intervention

INTRODUCTION

Studies have shown that certain nutritional imbalances appear to influence sleep quality. These imbalances have been indicated in terms of biological markers which may be useful parameters for sleep assessment. Magnesium is known to promote sleep in humans by promoting synthesis of serotonin which is

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essential for normal sleep regulation. This element is a prosthetic group for the serotonin N-acetyl transfers a key enzyme in melatonin synthesis; thereby this enzyme is considered as a marker. Iron deficiency also has an effect on quality of sleep. Kryger *et al*. (2002) Restless Legs Syndrome (RLS), which may be associated with iron deficiency is also a well defined sleep-related disorder characterized by abnormal sensations in legs at rest in conjunction with an urge to move the affected legs (Mizuno *et al*., 2005). It is documented to occur in higher frequency in anemic subjects. Likewise, vitamin B12 is known to be associated with the biological rhythm, clinically B12 is reported to improve the symptoms of sleep-wake rhythm disorders. Further, stress and related factors have been established to influence sleep. Catecholamines and cortisol that increase during stress are catabolic in nature and tend to alter the sleep related behaviors. During severe insomnia hyper secretion of cortisol is reported (Hudson and Bush, 2010; Ballenger, 1988). Therefore it was proposed to investigate the blood levels of certain selected biomarkers; magnesium, hemoglobin, ferritin, B12 and cortisol among patients suffering due to insomnia. Urine characteristics such as pH and Sp.Gr. were also studied, since they reflect metabolic status. It is worthwhile to mention that, in most of the nutrition studies inclusion of urine as a parameter is not considered, however, small changes in pH or the Sp. Gr. do indicate the biochemical alterations.

MATERIALS AND METHODS

About 800 subjects were screened for sleep quality and presence of insomnia. Thirty four subjects volunteered to participate in the "Intervention study".

After written informed consent: About 34 insomniac subjects were selected for "Intervention Study", based on purposeful sampling procedure. An assurance was given to the participants for the confidentiality of the subjective data. The total period for intervention was 15 days. Each participant was provided with the respective material for intervention on the first day after the biochemical investigation report was available. Each of the participants was contacted daily through telephone to ensure their continuation of intakes, or to receive any complaints. The proposed study involved human volunteers it was obligatory therefore to seek approval from HEC University of Mysore. The study was approved by HEC ethic committee.

Inclusion criteria: The criteria charted for the final selection of subjects included the following: 21-45 years old subjects of either gender. Free from mental health problems. Not being under any medication for more than three months. Non pregnant and non lactating women.

Exclusion criteria: Age<21 or >46 years**,** Being under any treatment or medication**.** Those with psychiatric problems.

Tools used for screening subjects: Standard questionnaires were used to obtain the following data from the selected subjects.

Demographic information: Name, address, education, occupation, Age and Marital status were collected using a questionnaire specially constructed for the study.

The Pittsburgh Sleep Quality Index (PSQI): This questionnaire is an effective instrument used to measure the quality and patterns of sleep in adults. It differentiates "poor" from "good" sleep by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction over the last month. The clients self-rate each of these seven areas of sleep. Scoring of answers is based on a 0-3 scale, whereby 3 reflect the negative extreme on the Likert Scale. A global sum of "5" or greater indicates a "poor" sleep.

Sleep Behavior and Insomnia Screening Questionnaire (ISQ): The guideline developed by "A Clinical Practice Guidelines Working Group" to assist physicians in the assessment of insomnia in adults (Alberta Health and Wellness, Alberta Medical Association) was used. This questionnaire assesses the perception of insomnia among people and was reported to be proper for reassessment in intervention studies. Development of the questionnaire was based on expert opinion and therefore merited as a suitable schedule. Presence of insomnia was assessed based on four questions enquiring whether, in the past four weeks, subjects experienced: (i) difficulty in initiating sleep; (ii) nocturnal awakenings with difficulty in returning to sleep; (ii) early awakening due to involuntary and too short sleep period (six hours or less) and (iv) non-restorative sleep with a feeling of tiredness on awakening and negative consequences in terms of daytime alertness, fatigue and irritability as a result of sleep problem.

SF 36 Health Survey Questionnaire (SF 36): The Short Form (36) Health Survey (SF-36) evaluates the functional health and well-being of the subjects. The test consists of 36 questions and requires 10 min to administer. It includes a multi-item scale with 8

subscales. A physical summary and a mental summary are included in the test scoring. Numerous studies have included this schedule for assessing QOL (Revicki *et al*., 1998), according to them, the Cronbach alpha rating ranged from 0.67-0.94 and the reliability coefficient was above 0.75 (Hopman *et al*., 2000; Ware, 2000).

Three days diet diary method: Dietary nutrient variables were computed based on values from diet diary for three consequent days. Dietary intake information was obtained from the participants. Subjects were trained about recording the data through demonstrating the use of standard cups, tumblers and spoons for serving food and drinks. Nutrient intake from dietary data was calculated using a nutrient ready reckoner for cooked foods standardized for the purpose.

The intervention study was conducted based on pre and post assessment for sleep quality, quality of life and certain blood and urine parameters. Blood Hemoglobin, serum levels of Magnesium, B12,

Ferritin and Cortisol were measured in volunteers for intervention study while blood for cortisol was drawn in the evening. Urine parameters: specific gravity and pH were proposed for the assessment. The samples were obtained at the time of drawing blood.

Intervention group classification: Three groups were proposed for this, intervention materials were Vitamin B12, poppy seed drink and beetroot drink. The distribution of subjects into the intervention group is presented in Table 1.

Criteria for selecting subjects for each intervention program:

B12: Those subjects who were found to be deficit in B12 based on blood analysis were assigned this group for intervention.

Poppy seed drink: Subjects who were found to have hyper-cortisol were included in this group.

Beet root powder drink: Subjects who were found to have low ferritin and hemoglobin levels were selected to be in this intervention group.

Beetroot powder preparation: fresh beetroots were crushed and the extract was dried in vacuum and sweetened with sugar at 25% level. One hundred gram of this powder was packed in polythene pouches of 100 micron gauge and sealed to prevent caking. This was to be reconstituted in 150-200 mL water and consumed 3-4 h before going to bed every night during 15 nights.

Table 1: Distribution of intervention groups (%)

Intervention group	Male n = 19 (45.2)	Female n = 23 (54.8)	Total n = 42 (100)
B12	10 (52.6)	2 (8.7)	12 (28.6)
Poppy Seed drink	4 (21.1)	7 (30.4)	11 (26.2)
Beet root powder drink	4 (21.1)	7 (30.4)	11 (26.2)

Poppy seeds powder preparation: poppy seeds were powdered finely to pass through an 80 mesh sieve and mixed with powdered sugar and pre gelatinized starch in the ratio of 10:10:2. Approximately 20-22 g of the mixture was packed in a polythene pouch of 100 micron gauge and sealed to prevent caking. This was to be reconstituted in 150 mL hot water and consumed 3-4 h before going to bed every night during 15 nights.

B12 dose: This was in the form of IM injections of 1000 mcg B12 given in an interval of 2 injections /week, a total of 4 injections in 15 days were provided.

Data maintenance and statistical application: The data obtained was carefully maintained, all the records of individual subjects were made into data sheet for easy access of information. The data was tabulated in Excel 2007 version, they were meaningfully presented to express the data comparison and draw meaningful and expressive inferences. Descriptive analysis were used to derive means, percentages, the means were compared using student‘t’ test, pared ‘t’test, Analysis Of Variance (ANOVA) by repeat measures and Pearsons correlation test were used. For testing of significance between the means ANOVA was applied. Chi- Square was applied to describe the relation and significance among the variables of the study.

Limitation of the study:

- The population is restricted to working people
- Number of subjects included for nutritional studies was small
- Duration of intervention was only 15 days that was a very short period

A perusal of Table 2 indicates the profile of blood parameters in the selected subjects for the intervention. The mean serum Magnesium level in both males and females was within the normal range, none of the selected subjects exhibited deficient level. However, a small gender gradient in values was obvious; females had lower values than males. A similar pattern was seen with hemoglobin values, none of the men counterparts were anemic and the mean hemoglobin was 15.5 g dL^{-1}.

Table 2: Pre intervention levels of selected blood parameters and urine profile of the subjects

	Male			Female		
Blood analysis	Mean	±SD	Normal range	Mean	±SD	Normal range
Magnesium						
mg/dL	2.120	0.110	1.3-2.5	1.98	0.160	1.3-2.5
Hemoglobin						
g/dL	15.500	1.130	13.8 -18.2	12.57	1.560	12.1 -15.1
Frritin						
ng/ml	122.450	81.500	30-400	35.61	32.550	13-150
B 12						
pg/mL	181.120	61.690	211-946	345.06	234.840	211-946
Cortisol mcg/dL	9.450	4.370	2.3-11.9	8.70	4.920	2.3-11.9
Urine analysis						
pH	6.130	0.670	6.0	5.54	0.650	6.0
Sp.Gr.	1.015	0.006	1.020- 1.028	1.01	0.008	1.020- 1.028

Table 3: Effect of Beet root powder intervention on blood and urine profile

	Beet root			
Blood analysis	B Mean± SD	A Mean± SD	t Critical-tow tail	Sig.
Hemoglobin g dL^{-1}	11.64±2.6	11.5±2.6	2.776445	NS
Ferritin ng mL^{-1}	7.02±0.08	10.975±1.08	4.302653	NS
B 12 pg mL^{-1}	157.4±29.7	184.38±40.1	2.776445	*
Urine analysis				
PH	5.6±0.65	4.95±1.83	2.262157	NS
Specific gravity	1.014±0.006	0.9125±0.320	2.262157	NS

Table 4: Effect of B 12 intervention on blood and urine profile

	B12			
Blood analysis	Mean± SD B	Mean± SD A	t Critical-two tail	P-Value
B12 pg mL^{-1}	152.87±23.9	1375.6±804.4	2.262157	***
Cotrisol mcg dL^{-1}	13.6±3.4	9.7±2.8	4.302653	**
Urine analysis				
PH	5.75±2.05	5.35±1.9	2.262157	NS
Sp.Gr.	0.9095±0.31	0.908±0.319	2.262157	NS

Table 5: Effect of poppy seeds intervention on blood and urine profile

	Poppy seeds			
Blood analysis	Mean± SD B	Mean± SD A	t Critical-two tail	P-Value
Frritin ng mL^{-1}	12.07±1.07	21.28±13.9	12.7062	Ns
B 12 pg mL^{-1}	142±29.3	271.03±149.8	4.302653	NS
Cortisol mcg dL^{-1}	16.6±3.4	11.7±2.5	2.776445	NS
Urine analysis				
PH	5.75±0.58	5.2±1.76	2.200985	NS
Specific gravity	1.0175±0.008	0.93±0.29	2.200985	NS

Mean hemoglobin for females was 12.57 g dL^{-1}, small proportions of the participants were found to be moderately anemic. Ferritin levels indicated large intra group variations in both men and women; higher proportions of women had deficient levels. Males had lower levels of serum B12 than females, the intra group variations were found to be large, although the mean values for both men and women were within normal range. The mean cortisol level was also within the normal range in both men and women; however more number of participants had higher level of cortisol.

Table 3 depicts the effect of beet root intervention on blood and urine profile of the subjects. It is clearly shown that beet root consumption did not change the hemoglobin levels while a marked increase was noted in Ferritin, although the increase was not statistically significant. Surprisingly, B12 level increased significantly with beet root powder intervention. Small differences in pH and Sp.Gr of urine were noted nevertheless the differences did not exhibit statistical significance. It is important to highlight that, decrease in Sp.Gr. does indicate a relatively higher urine volume. Since measurement of total urine output was not done, it is difficult to explain the observation.

It is demonstrate in Table 4 that B12 supplementation effectively increased (from 152.87±23.9 -1375.6±804.4 pg mL^{-1}) serum levels of this vitamin and the difference was extremely significant statistically ($p<0.01$). It was highly encouraging to note a significant reduction in cortisol levels with B12 supplementation within a period of 15 days. No changes were noticed in urine parameters unlike that seen with beetroot supplementation. This also suggests that single nutrient supplementation may bring about a specific change while a natural food or a composite supplement improves a variety of biological components as that seen in beetroot.

A perusal of Table 5 provides encouraging results about the improvement in blood profile of subjects on poppy seed supplementation. Literature indicates poppy seeds to be a good source of protein (21.7g %) and iron (15.9 mg 100 g^{-1}) as well as other micronutrients (Gopalan *et al*., 1980). It is evident from our results that mean value of ferritin increased after poppy seed intervention; this improvement can be attributed to the iron content of poppy seed. A decrease in serum cortisol level was also noted, the mean levels before and after intervention being 16.6 ± 3.4-11.7 ± 2.5 mcg dL^{-1} affect a mean reduction of 4.9 mcg dL^{-1}, although a striking difference was observed, it was statistically not significant.

Table 6: Effect of supplementation on co- morbid symptoms

	Insomnia		Anxiety		Circadian Rhythm disorders		Parasomnia		Restless syndrome		Sleep apnea		Hypersomnia	
Supplements	(%) imp	Sig.	(%) imp	Sig.	(%) Imp	Sig.	(%) imp	Sig.	(%) Imp	Sig.	(%) imp	Sig.	(%) imp	Sig.
B 12	33.4	*	20.0	NS	19.95	NS	50.10	*	66.8	**	50.1	**	0.00	NS
Poppy seeds	63.6	***	100.0	***	66.60	**	79.95	**	50.0	*	0.0	NS	25.00	NS
Beet Root powder	54.6	**	66.6	**	66.60	**	59.90	*	50.0	*	0.0	NS	39.86	NS

Imp = Improvement*sig K paired samples comparison (Friedman)

Table 7: Effect of intervention on mean scores for components of QoL in selected subjects

	B 12			Beet root			Poppy seed		
Quality of Life	Before	After	Sig.	Before	After	Sig.	Before	After	Sig.
General health	63.6±18.2	63.0±27.9	NS	51.5±18.0	69.8±14.5	*	66.5±21.8	72.2±24.1	NS
Vitality	69.2±11.2	68.3±25.9	NS	49.1±20.7	63.6±15.5	*	57.5±21.05	73.7±16.9	*
Pain	64±20.05	65.1±27.28	NS	54±17.6	74±19.67	*	69.2±25.5	84.7±20.8	NS
Social function	60.4±14.9	61.4±22.8	NS	61.4±21.2	65.9±18.6	NS	65.6±17.7	79.2±15.3	*
Average physical health	70.7±14.5	61.4±16.8	NS	58.8±16.9	57.8±15.7	NS	69.1±12.6	56.4±266.8	*
Average mental health	60.1±13.82	72±14.16	*	54.4±15.1	67.0±14.3	*	57.1±16.3	74.2±13.26	**
Average total SF 36 score	65.6±14.7	72.2±17.6	NS	56.2±18.2	71.8±14.7	*	65.2±15.9	78.6±14.27	*

Our results have documented measureable improvement in insomnia and the associated co-morbid symptoms (Table 6) . The maximum improvement in insomnia was found with poppy seed drink (63.6%) followed by beet root drink and B12 supplementation which varied from 54.6 and 33.4% respectively. Anxiety as a factor affecting insomnia was also assessed; improvement was noted in 20% of subjects in B12 and 66.6% in beetroot drink supplementation groups. It was encouraging to witness a 100% improvement in the group with poppy seed intervention. Significant improvement was noted in the Circadian rhythm disorder in all intervention groups except for B12, which was only 20%. Parasomnia and Restless Leg Syndrome (RLS) recovery was seen in all the intervention groups while highest proportion RLS improvement was noted in B12 group; this could be associated to reduction in anxiety. The subjects in B12 group exhibited approximately 70% improvement in sleep apnea problem; this could also be associated to an overall improvement in sleep condition during the time of intervention. Nevertheless, a caution should be exercised for considering the improvements as total recovery from the symptoms since each symptom is a multi etiological factor and the period of intervention in the present study was short. The curative treatment requires longer period of intervention. Hypersomnia which is caused by improper sleep during the previous night causing sleepiness during the following day was not improved in our intervention program. It is obvious from our observations that hypersomnia management requires a behavior modification.

Quality of life of selected subjects and the pattern of disturbances affecting daily activities due to poor sleep were assessed before and after intervention; the observations are presented in Table 7.

RESULTS AND DISCUSSION

Food supplements have traditionally been associated with promoting sleep (Morin *et al*., 2005). Some literature also exists to support soporific claims for other nutritional supplements. Evidence from these studies points to the possibility that sleep may be affected by vitamin and mineral intake (Meolie *et al*., 2005).

Beet root is a nutritious root and loaded with a variety of micronutrients such as beta- carotene, B1, B2, B6, C as well as traces of the rare metals like rubidium and caesium (Admin, 2010). It is an excellent source for calcium, magnesium, copper, phosphorus and sodium. It is also a remarkable source of choline, folic acid, iodine, manganese, organic sodium, potassium, fiber and carbohydrates in the form of natural digestible sugars (Gopalan *et al*., 1980). It is known to support formation of healthy RBC, the process of its involvement is yet unclear, it may be possible that high bioavailability of iron and other micronutrients along with the polyphenols contributes to its therapeutic effects (Miller *et al*., 2010). Beetroot owes its color to betanin which has two molecules of L-Dopamine (neurotransmitter), it postulated that this compound attributes properties such as, tranquilizing effect, mood, mental alertness and sleep. Beetroot is high in sugars, when taken at night is more likely to improve sleep (Admin, 2010). The results obtained in the present study are a clear evidence of the benefit due to beet supplementation (Table 6). In addition, it is encouraging to note the increase in blood values for ferritin and B12 (Miller *et al*., 2010).

Vitamin B12 has been reported to regulate biological rhythm in humans, thereby improve symptoms of sleep-wake rhythm disorders. It is suggested to have favorable effects on delayed sleep

phase syndrome and irregular sleep-wake pattern. Experimental human studies, together with clinical ones suggest the clinical efficacy of B12 is related to its role in the regulation of the biological clock and modulating melatonin secretion. Thus B12 promotes the cyclic appearance of sleep and sleep maintenance. Methylcobalamin, the active form of vitamin B12 is a cofactor for methionine synthase in methionine metabolism and is essential to lower blood levels of homocysteine. Since homocysteine levels modulate cortisol secretion, B12 is essential nutrient in the control of stress and mood modulations.

Poppy seeds have immense health benefits to man. It is an important herb in Ayurveda to treat various health conditions (Aruna and Sivaramakrishnan, 1992). It has properties such as analgesic, calmative, bactericidal and sedation and is a versatile member in pharmacological application (Qidwai *et al*., 2003). Its sedation effect may be a reason for improved sleep. However, it is worthwhile to mention that, a cumulative effect of protein from the seeds and sugar added to the drink may have stimulated the secretion of serotonin causing improved sleep during intervention period (Cohen *et al*., 2002; Nergiz and Otles, 1999). Further, poppy seed drink brought about a marked increase in serum B12 levels, although it is not a good source for this nutrient.

The improvement in serum B12 can be partly explained on the basis that, improved sleep can reduce stress with a parallel decrease in co morbid symptoms reducing requirement for B12 and a sparing effect. With respect to urine profile, marked differences in Sp.Gr. was seen; this is a clear indication of its effect on kidney function and clearance of solute load. It is worthwhile to mention that, composite foods having nutraceutical properties tend to improve physiological wellbeing more than what an individual nutrient can perform. In the present study, intervention was for 15 days as a result it may not have led to a significant improvement. Hemoglobin is known to be under the influence of ferritin saturation; since the basal level of ferritin in the selected subjects was very low and period of intervention was short, effective increase in Hb was not shown. Further it was an interesting observation that beet root and poppy seeds have led to an increase in B12 levels (Demain and White, 1971). A few studies have reported increase in blood B12 levels with beetroot supplementation (Song *et al*., 2007). Although it is difficult to argue the biological factors related to the increase in B12, it would be right to interpret the effects based on improvement in quality of sleep and circadian rhythm. Such improvements can be expected to reduce physiological stress and help support the immune system, thereby spare the available B12 for the biological function. Betanin is known to be a potent antioxidant and also is expected to improve B12 absorption (Fa *et al*., 1984; Craig, 2004). Significant differences in urine profile was not noted, however marked reduction in Sp.Gr. had occurred.

The diagnostic and management strategies for insomnia have a common relationship. The diagnosis is related to specific symptoms, such as stress related problem, un-timed activities during the day and night, circadian rhythm disorders, obstructive sleep apnea, restless legs syndrome and periodic limb movement disorder, parasomnia related to a medical, neurological and psychiatric disorders.

Vitamin B12 is a critical nutrient for the regulation of body's cellular energy cycle and its deficiency causes fatigue, memory loss and emotional problems, particularly depression and irritability. Long standing deficiency of B12 leads to nerve damage (Herbert, 1988). Thus, B12 deficiency can alter quality of life to a great extent. Our study has demonstrated that supplementation of B12 improved. QoL (average total of SF 36) however its effect on mental activity was statistically significant. Beet root supplementation brought about significant improvement ($p<0.05$) in General health, vitality, pain reduction and mental health as well as total score for QoL. A similar effect was seen with Poppy seed, improvement in mental health was highly significant with $p<0.01$, while there was a significant ($p<0.5\%$) improvement in vitality, Social function, Physical health as well as total scores for QoL. It is encouraging to note an overall improvement in QoL among people on intervention using a natural composite food. It would be valid to argue that, monitoring sleep and its associated symptoms is better with a natural food tranquilizers such poppy seeds and high glycemic index foods and those rich in antioxidant before 3-4 h of sleep as compared to pharmacological preparations or the dose of single nutrients. It can be mentioned that sleep complaint is common in general populations, however it is important to realize that with reoccurrence and persistence of symptoms require professional advice and management.

CONCLUSION

Insomnia and quality of life have interrelationships; its effects may extend to all components of QoL as well as impairment of social function and work performance. Apart from poor quality of life and psychiatric disorders, nutritional status of an individual could play a major role on sleep quality.

There remains a great need for educational programs regarding insomnia assessment and treatment from the perspective of both the patient and clinician. Insomnia is not only a widely prevalent condition, but also a condition with extensive associated burden of illness.

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