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Small Intestinal Bacterial Overgrowth in the Elderly: An often Missed Entity

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ABSTRACT

Small intestinal bacterial overgrowth (SIBO) is a condition in which non-native bacteria and/or native bacteria are present in increased numbers resulting in excessive fermentation, inflammation, or malabsorption. Patients with SIBO vary in presentation, from being only mildly symptomatic to suffering from chronic diarrhea, weight loss, and malabsorption. A number of diagnostic tests are currently available, with aspiration of the small intestinal fluid being the gold standard. Treatment encompasses a multimodal approach including treatment of the underlying disease, nutritional support, and antibiotic therapy. In this review, we discuss the risk factors, clinical manifestations, diagnosis, and treatment of SIBO in the elderly.

Key words: Small intestinal bacterial overgrowth, Diarrhea, Bloating, Aspire, Breath test, Antibiotics

Small intestinal bacterial overgrowth (SIBO) is defined as any condition in which part of the small bowel harbors for a long time bacterial counts over 10 Colony Forming Units/ml (CFU/ml) in the intestinal juice (Mitsui *et al.*, 2006). Bacterial proliferation deprives the host of macro- and micronutrients (Bouhnik *et al.*, 1999). In spite of being a common cause of malabsorption, it remains an under-recognized clinical syndrome in the elderly. The exact prevalence is unknown and varies considerably from 2.5 per cent to 90 per cent in older adults with lactose intolerance (Almeida *et al.*, 2008).

Risk Factors and Predisposition to SIBO

Advanced age is an independent risk factor for SIBO. It is not clear if overgrowth results from the ageing process itself and age-related changes in intestinal motility or if it is a consequence of achlorhydria. Early studies in this area found that SIBO was a common (and often unrecognized) cause of malabsorption in the elderly⁴⁴, and that many of these patients did not have an obvious predisposing factor, such as a blind loop (McEvoy *et al.*, 1983). More-recent studies have reported SIBO in asymptomatic elderly persons residing in the community. These patients, although asymptomatic, had lower weights and body mass indices (BMI) than expected, and treatment with antibiotics increased both weight and BMI (Parlesak *et al.*, 2003).

Interestingly, Mitsui *et al.*, reported SIBO (diagnosed by glucose hydrogen breath test) in 25.6 per cent of disabled older adults but none in healthy older adults (Mitsui *et al.*, 2006). Advanced age predisposes to SIBO due to a wide variety of reasons. Geriatric population is more likely to have a decline in gastric acid due to an underlying gastric disease or use of acid neutralizing agents.

Risk factors for SIBO are summarized in Table 1.

Table 1
Risk Factors for Development of SIBO

Advanced age

Anatomic abnormalities

- Surgically created blind loops (Billroth II gastrectomy, end-to-side anastomosis)
- Small bowel diverticulosis
- Small intestinal strictures (radiation, Crohn's disease, surgery, focal segmental ischemia)

Motility disorders

- Diabetes mellitus (Goldstein *et al.*, 1970)
- Scleroderma (Kahn *et al.*, 1966)
- Celiac disease (Tursi *et al.*, 2003)
- Idiopathic intestinal pseudo-obstruction (Pearson *et al.*, 1969)

Reduced gastric acid secretion

- Acid-lowering medication (Pereira *et al.*, 1998)
- Atrophic gastritis
- Previous vagotomy (Browning *et al.*, 1974)

Abnormal connection between colon and proximal bowel

- Gastrocolic or enterocolic fistula
- Resection of ileocecal valve

Medication induced

- Recurrent antibiotics

Others

- Cirrhosis (Gunnarsdottir *et al.*, 2003)
- Chronic pancreatitis (Lembeke *et al.*, 1985)
- Chronic kidney disease (Strid H. *et al.*, 2003)
- Radiation enteritis (Husebye, E. *et al.*, 1995)
- Rheumatoid arthritis (Henriksson AE *et al.*, 1993)
- Immunodeficiency states
- Malnutrition
- Interstitial cystitis (Weinstock *et al.*, 2007)
- Acne rosacea (Parodi A. *et al.*, 2008)
- Morbid obesity (Sabate *et al.*, 2008)
- Fibromyalgia (Pimentel M. *et al.*, 2004)
- Acromegaly (Resmini E. *et al.*, 2007)

The bacteria in SIBO are similar to those found in the normal colon and certain organisms are common.

Organisms commonly responsible for SIBO are summarized in Table 2

Table 2
Organisms in SIBO

Aerobic organisms

- *Escherichia coli*
- *Streptococcus*

- Staphylococcus
- Micrococcus
- Klebsiella
- Proteus

Anaerobic Organisms

- Lactobacillus
 - Bacteroides
 - Clostridium
 - Veillonella
 - Fusobacterium
 - Peptostreptococcus
-

Effects of SIBO on Intestinal Structure

Histologic appearance of the small intestine in SIBO is usually not significantly altered. In some cases, SIBO is associated with subtotal villus atrophy and increased cellularity in the lamina propria, which may be confused with celiac disease. Focal areas of ulceration and erosions also may be seen. The degree of mucosal inflammation can vary from mild to severe. Epithelial cell injury and inflammation may ultimately impair absorptive function.

Electron microscopy studies of experimental animals with SIBO have described enterocyte abnormalities, such as vacuolization of microvillus membranes and mitochondrial swelling. (Toskes PP *et al.*, 1975)

Mechanism of Malabsorption

Impaired absorption of nutrients in SIBO results from either maldigestion in the intestinal lumen, or from malabsorption at the level of the intestinal microvillus membrane due to enterocyte damage.

Carbohydrate malabsorption in SIBO results from the intraluminal degradation of sugars by enteric bacteria leading to the production of short-chain fatty acids, carbon dioxide, hydrogen, and methane, which may be associated with acidic stools, abdominal distension, and flatulence. Another mechanism that leads to carbohydrate malabsorption in SIBO is

by reducing the brush border disaccharidase levels (Sherman P. *et al.*, 1985).

Fat malabsorption results from bacterial deconjugation of bile acids and the toxic effect of free bile acids on the intestinal mucosa (Tabaqchali S. *et al.*, 1968). Hydroxylated fatty acids (and free bile acids) stimulate the secretion of water and electrolytes leading to diarrhea. Fat malabsorption may lead to weight loss, steatorrhea, and deficiencies of fat soluble vitamins A, D, E, and K.

Protein malabsorption probably results from decreased mucosal uptake of amino acids and the intraluminal degradation of protein precursors by bacteria (Sherman P. and Lichtman S. 1987). SIBO may also be associated with a reversible form of protein-losing enteropathy.

Vitamin B12 malabsorption results from anaerobes which can utilize vitamin B12 coupled to intrinsic factor (Giannella RA *et al.*, 1972). Malabsorption of vitamin B12 may result in anemia and neurologic disturbances.

Clinical Features

Clinical features in SIBO can be variable ranging from the asymptomatic to presence of only nutrient deficiencies to extreme of weight loss with failure to thrive. Classic manifestations include anorexia, bloating or flatulence, abdominal discomfort, pain and diarrhea. Complaints in the old may be atypical and may even resemble gradual deterioration in health falsely attributed to ageing. Some patients may report improvement in abdominal complaints following a recent antibiotic course prescribed for an unrelated respiratory or urinary infection.

Patients with vitamin B₁₂ deficiency can present with neurologic symptoms, central or peripheral neuropathy, and symptoms of anemia, such as fatigue, breathlessness, and chest pain. Those with fat-soluble vitamin deficiency can present with night blindness (in vitamin A deficiency) and metabolic bone disease (in vitamin D deficiency). Osteoporosis is another well-recognized complication of SIBO (Di Stefano M *et al.*, 2001 and Stotzer PO *et al.*, 2003).

Diagnosis

The diagnosis of SIBO should be considered in any patient with malabsorption and a predisposing condition.

Aspiration

The gold standard test for the diagnosis of SIBO is aspiration of small intestinal fluid with culture and bacterial counts of the aspirate; presence of more than 10^5 CFU/mL of duodenal aspirate is considered diagnostic. However it time consuming, invasive, and costly. Other potential problems with aspiration of small intestinal fluid include contamination of the aspirate with bacteria from the mouth and technical difficulties with transport and culture of the aspirate.

Breath Tests

Breath tests are simple and noninvasive and therefore are more attractive than duodenal intubation or endoscopy for collecting intestinal aspirates. Moreover older patients tolerate breath tests well. For reliable testing the patients should be advised to avoid high-fiber or carbohydrate rich foods for at least a day prior to the test.

Glucose hydrogen breath test is safe and easy to perform in the outpatient setting. It evaluates carbohydrate malabsorption. Normally, glucose is absorbed completely in the upper small intestine; with bacterial overgrowth, however, the glucose is cleaved by bacteria into carbon dioxide and hydrogen. The hydrogen is measured in the exhaled breath (at baseline and then every 30 minutes for 2 hours); a rise of 20 parts per million (ppm) above the baseline is regarded as diagnostic of SIBO. Fasting breath hydrogen levels of more than 20 ppm also are considered positive.

The lactulose hydrogen breath test is based on a principle similar to that of the glucose hydrogen breath test: Lactulose is a disaccharide that is not absorbed in the small intestine but is metabolized by bacteria in the proximal colon, producing a late peak in exhaled hydrogen. In the presence of bacterial overgrowth, an early hydrogen peak is observed.

Additional tests to evaluate anaemia or nutrient deficiencies and their cause may be required; fecal fat collection may help confirm steatorrhea;

radiological tests may help diagnose anatomic abnormalities such as diverticulae or fistula.

Differential diagnosis of SIBO is summarized in Table 3.

Table 3
Differential Diagnosis of SIBO

Chronic diarrhea

- Osmotic diarrhea
- Fatty diarrhea
- Inflammatory diarrhea
- Secretory diarrhea

Celiac disease

Chronic pancreatitis

Chronic mesenteric ischemia

Inflammatory bowel disease

Irritable bowel syndrome

Treatment

Treatment of small intestinal bacterial overgrowth (SIBO) consists of a multimodal approach including treatment of the underlying disease, nutritional support, and antibiotic therapy. SIBO due to sluggish motility should be treated with medications to enhance motility to eliminate and prevent relapse of SIBO. Drugs that reduce motility (narcotics, benzodiazepines, antimotility agents) commonly prescribed in the elderly should be discontinued. Attention should be given to the patient's nutritional state, and any vitamin deficiency should be corrected.

As prolonged or excessive acid suppression may be a contributing factor for the development of symptoms of SIBO, the use of acid suppressive medication should be minimized to the lowest possible dose for the condition being treated and for the shortest duration. Any predisposing anatomic or functional abnormality should be corrected when possible.

There are no controlled trials to guide the duration of treatment or management of recurrent SIBO and recommendations are generally based

on clinical experience. Antibiotics that have been found to be effective include metronidazole, rifaximin, amoxicillin, amoxicillin-clavulanate, ciprofloxacin, tetracycline, and cotrimoxazole.

Therapy usually is given initially for two weeks, and then clinical response is assessed; it may be useful to repeat a breath test or culture of small intestinal aspirate. Many patients with an underlying anatomic or motility disorder require permanent antibiotic treatment; in such patients, it is usual to rotate antibiotic treatment every two weeks or, alternatively, to give antibiotics for two of every four weeks. Continuous treatment with a single agent can lead to antibiotic resistance or to side effects associated with long-term use, such as peripheral neuropathy in patients given metronidazole.

The somatostatin analog octreotide stimulates intestinal motor activity when administered in low dosage. It has been reported to be effective in SIBO associated with scleroderma (Soudah HC *et al.*, 1991).

Probiotic therapy is a logical and attractive approach to the management of SIBO. The impact of probiotic yogurt administration for 4 weeks was studied in healthy older community subjects; normalization of the various cytokine responses and modulation of activation markers in blood phagocytes became more apparent in the group with positive breath test (Schiffrin EJ *et al.*, 2009).

Conclusion

Elderly patients have a high prevalence of malnutrition. SIBO is often an under recognized cause of malabsorption in the geriatric population, commonly mistaken for other disorders. In any cause of malnutrition or weight loss in the elderly that is not fully explained, it may be worthwhile to exclude the diagnosis of SIBO. Treatment not only has the potential to improve patient's wellbeing and quality of life but also avoids unnecessary costs and treatment for alternate erroneous diagnoses.

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Effect of Cawthorne and Cooksey Exercises on Balance In Elderly and Risk of Fall

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ABSTRACT

The purpose of the present study was to identify the effect of a specific therapeutic approach for the vestibular system by the application of Cawthorne and Cooksey exercises, to observe whether the exercises generates motor learning and contributes to improving balance and reduces the risk of fall in the elderly. A total of 30 subjects (Male–10, Female–20), aged 60–70 years participated in the study. The subjects were randomly chosen as per the inclusion criteria and divided into two groups. Group A (submitted to Cawthorne and Cooksey exercises, n=15) and group B (was not submitted to Cawthorne and Cooksey exercises, n=15). The result of this study showed that percentage of improvement in group A (submitted to Cawthorne and Cooksey exercises) was 19.378 per cent when compared with group B (submitted to Activity of Daily Living) percentage improvement of 3.48 per cent. This indicate to subjective conclusion that Cawthorne and Cooksey exercises improve balance in the normal old subjects also.

Key words: Balance, Cawthorne and Cooksey Exercises, Berg Balance Scale.

Balance is a complex motor control task involving the detection and integration of sensory information to assess the position and motion of the body in space and the execution of appropriate musculoskeletal responses to control the body position within the context of the environment and the task. (Anne D. Kloos and Deborah Givens Heiss (2002). In our body, the

vestibular apparatus is called as the sense organ of balance (equilibrium). The tracts that descend from the vestibular nuclei into the spinal cord (vestibulospinal tract) maintain tone in antigravity muscles and coordinate the adjustments made by the limbs and eyes in response to changes in body position. Vestibular apparatus, thus, plays a role in the support of the head during movement, orientation of head in space and reflexes accompanying locomotion. (Jain, A.K. 2014) Receptors in the semicircular canals detect angular acceleration of the head, whereas receptors in the otoliths (utricle and saccule) detect linear acceleration and head position with respect to gravity. Anne D. Kloos and DG Heiss (2002) Hence, the vestibular apparatus is called as the sense organ of balance (equilibrium). Vestibular system controls eye movements via its ascending connection to the cranial nerve nuclei. Therefore, in spite of changes in head position, the eye can remain fixed on the same point (vestibulo-ocular reflex). Orientation i.e. relative position of various body parts in space depends on four inputs: from the vestibular receptors, from visual information, by impulses from proprioceptors in joint capsule and by impulses from cutaneous exteroceptors, specially touch and pressure receptors. (Jain, A.K. 2014) The stability of the body depends on the proper reception of information through sensory components, cognitive, central nervous and musculoskeletal systems in an integrated manner. (Adalgasia RP *et al.*, 2006) In addition to allowing us to detect hazards in the environment, vision plays a direct and important role in stabilizing balance by providing the nervous system with continually updated information regarding the position and movements of body segments in relation to each other and the environment. (Stephan 2003)

The cumulative effect of changes related to age, disease and inadequate environment seems to predispose to falls. Impaired balance in older people manifests as falls and fall-related injuries. (Ibid.) Fall is an accidental event that results in a change of position of the individual to a lower level in relation to its initial position, with inability to fix in a timely manner and ground support. Moreover, the risk of falls and resultant injury increases with advancing age and increases exponentially as additional risk factors are added. (Sean Clark and Debra J Ros, 2001 and Takuya and Tomoaki Shimada, 2007). Approximately 35 per cent of people over the age of 65 fall at least once per year, and 20 per cent to 30 per cent of falls result in moderate to severe injuries that adversely affect their mobility and

independence. (Sean Clark and Debra J. Rose, 2001; Stefano *et al.*, 2003 and Kirsten K Ness *et al.*, 2003)

Even the ability to control balance while walking is a fundamental skill that is frequently compromised by advanced age. For older people, control of dynamic balance can become increasingly difficult and walking is associated with increased risk of falls. (Nataliya S *et al.*, 2004) Many older adults experience difficulties and often at increased risk for falls when performing ADLs (Activity of Daily Living) that require dynamic postural control. (Nataliya S *et al.*, 2004 and Catherine S *et al.*, 2009) As the body functions of the elderly decline with age and that the further loss of body function is brought about by lack of exercise due to lifestyle and physical inactivity due to high morbidity.

Falls have different impacts on the life of an elderly, which can include significant morbidity, mortality, functional impairment, hospitalization, institutionalization and use of social services and health. Besides the direct consequences of the fall, older people restrict their activities due to pain, disability, fear of falling, protective attitudes of family members and caregivers, or even the advice of health professionals. (Rose, D. J. *et al.*, 2006)

As systems in our body have physiological reserves that are characterized in the nervous system by their capability to reorganize, known as neuro-plasticity. As a result of ageing, reserves are reduced, but not depleted, therefore, the creation of an ideal environment for motor learning may determine a significant improvement of the function. Pohl and Winstein stated that practice improves neural processing skills in the elderly as well. (Angela dos, and J.S. Pereira 2005)

Vestibular exercises, such as the ones described by Cawthorne and Cooksey, may serve as support for new arrangements of peripheral sensorial information, allowing new vestibular stimulation patterns necessary for new experiences to become automatic. This practice of balance would be capable of promoting improvement in reactions of balance and, consequently, reduce falls (Anne D. Kloos and D.G. Heiss, 2002). The clinical recovery aided through these exercises is thought to rely on the following mechanism-adaptation i.e. modification of the gain of relevant vestibular oculomotor and vestibulospinal circuits and habituation i.e. central process of learning that is independent of sensory adaptation and motor fatigue. (Stefano, C., *et al.*, 2003) These exercises are

part of a vestibular rehabilitation program and involve head, neck and eye movements, posture control exercises in different positions (seated, in two-leg and one-leg positions, walking), use of soft surface to reduce proprioceptive input, and exercises with closed eyes to exclude visual cues. (Angela dos SBR *et al.*, 2005) Stefano Corna *et al.*, (2003) did a study to compare Cawthorne and Cooksey exercises and sinusoidal support surface translations to improve balance in patients with unilateral vestibular deficit. It was found that Cawthorne and Cooksey exercises are equally effective in improving balance as instrumental rehabilitation training program. (Ibid.) However fewer evidence were available for similar effects in geriatric population.

Therefore the purpose of the present study was to identify the effect of a specific therapeutic approach i.e. Cawthorne and Cooksey exercises on the vestibular system to observe whether these exercises generates motor learning and contributes to improving balance and reduces the risk of fall in the elderly.

Materials & Methods

A total of 30 subjects (Male-10, Female-20), aged 60-70 years matched for their age, height, weight & functional capacity participated in the study. The subjects were randomly chosen as per the inclusion criteria and divided into two groups. Group A (submitted to Cawthorne and Cooksey exercises, n=15) and group B (was not submitted to Cawthorne and Cooksey exercises, n=15). The subjects included in the study were taken from the "Shri Paramhans Advait Mat Aashram, Vasant Kunj". An experimental design was used in the study to determine the effect of Cawthorne and Cooksey exercises in improving balance in elderly and reduction of likelihood of falls in them with the help of berg balance scale (BBS). In the Procedure Subjects included in this study, as per the inclusion criteria & an informed consent duly signed by them, were given detailed verbal description of the procedure and any query on their part was solved before the commencement of the study. Prior to the beginning of the study, complete evaluation was done and demographic data was collected. All the subjects underwent the following procedure.

Pre-intervention Testing

Pre-intervention testing included measurement of balance by using Berg Balance Scale.

Each subject was asked to perform 14 observable tasks common to everyday life and these tasks were prior demonstrated to them. And these were: Sitting to Standing, Standing unsupported, Sitting with back unsupported but feet supported on floor or on stool, Standing to sitting, Transfers (Chairs should be arranged for a pivot transfer. Subject was asked to transfer one way toward a seat with armrests and one way toward a seat without armrests), Standing unsupported with eyes closed, Standing unsupported with feet together, Reaching forward with outstretched arm while standing, Pick up object from the floor from a standing position, Turning to look behind over left and right shoulders while standing, Turn 360 degrees, Placing alternate foot on step while standing unsupported, Standing unsupported one foot in front, Standing on one leg.

In most items, the subject was asked to maintain a given position for specific time. The subject was instructed not to touch an external support or any assistance. Subjects were asked to maintain their balance while attempting these tasks. Subjects of group A were taught Cawthorne and Cooksey exercises. These exercises were performed 6 times per week for 6 weeks for 30 minutes each day. Group B was not submitted to these exercises. Subjects in this group were encouraged to perform their usual activities for daily living. Following the intervention measurements were taken post-intervention after completion of the 6th week in both the groups by Berg balance Scale. The data thus collected was recorded.

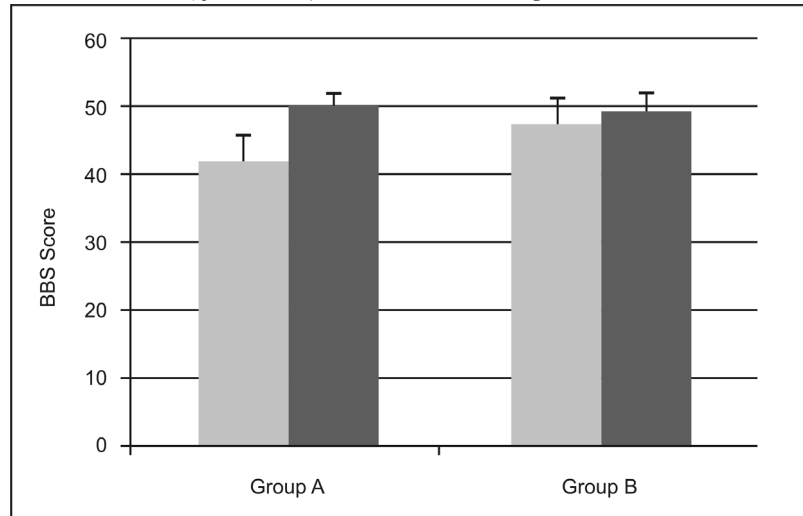
Result and Discussion

Table 1

Comparison of Pre and Post (after 6 weeks) intervention of Berg Balance Scale of Subjects in Group A and Group B:

<i>Variable</i>	<i>Pre-intervention</i>		<i>Post-ntervention</i>		<i>Percentage of Improvement</i>
	<i>Mean</i>	<i>Standard deviation ($\pm$)</i>	<i>Mean</i>	<i>Standard Deviation ($\pm$)</i>	
Berg Balance Scale Score in GROUP A	42.33	3.4	50.533	1.85	19.378%
Berg Balance Scale Score in GROUP B	47.866	3.593	49.533	2.629	3.482%

Figure 1
*Comparison of Pre- Intervention and Post - Intervention
(after 6 weeks) Measures between Group A and B*



The demographic data (age, sex) and the pre-intervention BBS (Berg Balance Scale) scores for both the groups, group A (submitted to Cawthorne and Cooksey exercises) and group B (not submitted to these exercises) were similar at the start of the study. This suggests that both the groups are homogeneous and the subjects were comparable in terms of studied variable. The results found in this study confirmed that according to BBS (Berg Balance Scores), healthy elderly subjects have balance disorders and run the risk of falling. (Angela dos SBR *et al.*, 2005) The observed changes in the Berg Balance Score revealed that Cawthorne and Cooksey exercises can improve balance in the normal elderly people, aged 60–70 years of age. The result of the study showed that Cawthorne and Cooksey exercises improved balance in group A which was submitted to these exercises.

The possible reason could involve that these exercises are part of a vestibular rehabilitation program and involve head, neck and eye movements, posture control exercises in different positions (seated, in two-leg and one-leg positions, walking), use of soft surface to reduce proprioceptive input, and exercises with closed eyes to exclude visual cues.

Even these exercises combine head movements while fixating a target to produce retinal slip. The Central Nervous System then, attempts to reduce this error signal by modifying the gain of vestibular system, that is, through adaptation of the vestibular system. Adaptation is modification of the gain of the relevant vestibulo-oculomotor and vestibulospinal circuits and habituation, that is, a central process of learning which is independent of sensory adaptation and motor fatigue (Stefano, C. *et al.*, 2003).

The result of this study showed that percentage of improvement in group A (submitted to Cawthorne and Cooksey exercises) was 19.378 per cent and in group B which was not submitted to these exercises percentage of improvement to be 3.48 per cent. The improvement in group A is higher than group B who was not submitted to vestibular exercises. This indicates that Cawthorne and Cooksey exercises improve balance better in the normal elderly subjects. The findings of the study corroborates with similar study done by Angela dos SBR and João Santos Pereira (2005), which studied the effect of Cawthorne and Cooksey exercises on balance in post menopausal women and found out that these exercises improve balance in post menopausal women.

Based on the findings of the study, it is recommended that elderly subjects, who does not reported presence of posture instability and/or the event of fall, should be submitted to vestibular stimulation exercises, that are easy to apply and affordable, which are preventive and curative concerning balance deficits and risk of falls. Considering that falls are aspects that substantially change the quality of life of the elderly and that life expectancy of the population in general has increased significantly, leading to increasingly higher elderly population every year, general therapeutic interventions directed to the elderly and especially those that provide prevention of falls owing to improvement of posture stability, will eventually lead to improvement in quality of life of elderly people. (Angela dos and J.S. Pereira 2005; Adalgisa PR *et al.*, 2006) Therefore this study indicates to the conclusion that Cawthorne and Cooksey exercises may improve balance and decrease the likelihood of falls in the elderly population. However a larger sample size can assist in generalizing the results to general population in future.

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Physical Exercise Practices among Elderly Type 2 Diabetic Patients in A Tertiary Care Hospital

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ABSTRACT

Physical exercise is considered as a critical part of therapeutic lifestyle intervention in type 2 diabetes mellitus and there is a scarcity of research on physical exercise practices involving only elderly with type 2 Diabetes mellitus. In this context, present study was undertaken with an objective to find out the prevailing physical exercise practices among elderly patients with type 2 Diabetes mellitus among inpatients of tertiary care hospital, Bangalore, Karnataka, India. Data was collected by interviewer administered method from 102 elderly patients aged 60 years and above suffering from type2 diabetes mellitus regarding socio-demographic factors, current exercise practices, complications, co-morbidity by using pre-tested, structured Performa and waist circumference was measured and grouped according to International Diabetes Federation classification. In the present sample, 39.2 per cent were practicing walking as physical exercise. Among them, 70 per cent were in the age group of 60–69 years, 65 per cent were males. Regarding the practice of physical exercise, 82.5 per cent subjects practised for more than 5 days/week and 77.5 per cent practised for >30 min/day. Only 36.8 per cent, 38.5 per cent and 31.8 per cent of subjects were suffering from diabetes mellitus complications, co-morbidities and central obesity practiced physical exercise. The present research found that 39.2 per cent of the elderly with type 2 diabetes mellitus were engaged in walking as physical exercise which needs to be confirmed by undertaking further in-depth research in India.

Key words: Elderly, physical exercise, physical activity, type 2 diabetes mellitus, central obesity

Ageing is a universal, intrinsic and progressive process. The elderly population in India according to the 2011 census is 103.8 million and proportion of elderly persons in India rose from 6.8 per cent in 1991 to 8.2 per cent in 2011 (Hameed *et al.*, 2014).

The ageing of the overall population is a significant driver of the type 2 diabetes epidemic. Globally, more than half of the people with diabetes are above the age of 60 years. In India, the prevalence of diabetes is 11 per cent in people between 65 and 69 years of age (Baruah, *et al.*, 2011).

The type 2 diabetes in elderly is linked to reduced functional status, increased risk of institutionalization, higher mortality and is at substantial risk for both acute and chronic cardiovascular complications.

The dietary management plays less of a role in elderly diabetic patients but physical exercise is considered as a critical part of therapeutic lifestyle intervention in type 2 diabetes mellitus (T2DM). The physical exercise is considered as a behaviour which promotes healthy life style. The therapeutic effects of physical exercise in patients with type 2 diabetes include improvements in glycemic control, cardio-respiratory function, body composition, physical functioning and wellbeing (Hordern, *et al.*, 2012).

Many studies have shown that, elderly with T2DM have low levels of physical activity than younger patients due to fear of falls, poor vision, poor mobility, arthritis of knees, poor physical fitness, unfamiliarity with footwear and poor roads (Seshadri, *et al.*, 2012)

There is a confusion exist between physical activity (PA) and physical exercise (PE) among clinicians, researchers and policy makers alike and often used by them interchangeably (McDermott, A.Y, and Mernitz, H. 2004). There is a paucity of exercise therapist and scarcity of research on physical exercise practices involving only elderly with type 2 Diabetes mellitus and lack of appropriate recommendation on physical exercise in India. In this context, to begin with the present exploratory research was undertaken to find out the prevailing physical exercise practices among elderly patients with type 2 Diabetes mellitus in a tertiary care hospital.

Methodology

Sample

The present exploratory study of descriptive nature was conducted in Kempegowda Institute of Medical Sciences Hospital and Research Centre

(KIMSH & RC), a tertiary care hospital in Bangalore. Totally 102 elderly above the age of 60 years of either sex with confirmed type 2 diabetes mellitus based on the diagnosis made by physician were enrolled after taking informed consent by using purposive sampling technique over a period of three months (January – March 2009) from the medicine in-patients department by excluding the seriously ill, cognitively impaired, patients with difficulty in hearing and speech and those not willing to give informed consent.

Procedure

Interview of these subjects were conducted using a pre-tested structured questionnaire by trained investigators and information was collected regarding the socio-demographic characteristics, practice of physical exercise pattern which include type, frequency, duration and place, complications of diabetes mellitus and co-morbid conditions.

The central obesity was assessed by measuring waist circumference due its association with type 2 diabetes mellitus by instructing the subject to stand relaxed with feet close together, arms at the side and bodyweight evenly distributed. The measurement was done at the end of normal expiration at the midpoint between the lower margin of the least palpable rib and the top of the iliac crest, using a stretch resistant tape. Based on the waist circumference measured central obesity was assessed using International Diabetes Federation (IDF) classification and subjects were determined to have central obesity when the waist circumference measured >90 cm in males and >80 cm in females (Wasir, *et al.*, 2008).

The data was analysed using Microsoft excel 2007 and the descriptive statistics such as percentages, mean, standard deviation were used.

Results

In the present study, out of 102 elderly diabetic subjects, only 40 (39.2%) were practicing physical exercise and all are engaged in walking as the physical exercise with mean age of the subjects 67.1 ± 6.2 years. Among the subjects practicing physical exercise 28 (70%) were in the age group of 60–69 years, 26 (65%) were males and 29 (72.5%) was from urban area. Regarding education and occupation status of subjects, 29 (72.5%) were literate and 22 (55%) were employed (Table 1).

Table 1
Distribution of Socio-demographic Characteristics According to Physical Exercise Practices

<i>Variable</i>	<i>Category</i>	<i>No. of subjects (n=102)</i>	<i>Subjects on PE (n=40)</i>
Age (years)	60–69	68	28 (41.2)
	= 70	34	12 (35.3)
Sex	Male	57	26 (45.6)
	Female	45	14 (31.1)
Location	Urban	63	29 (46.1)
	Rural	39	11 (28.2)
Education	Illiterate	54	11 (20.4)
	Literate	48	29 (60.4)
Occupation	Unemployed	54	18 (33.3)
	Employed	48	22 (45.8)
Physical activity	Sedentary	58	22 (37.9)
	Moderate/Heavy	44	18 (40.9)
Family history of DM	Yes	50	21 (42.0)
	No	52	19 (36.6)
Duration of DM (years)	= 10	68	27 (39.7)
	> 10	44	13 (38.2)

Figures in parenthesis indicate percentages.

Based on physical activity in occupation, amidst subjects practicing physical exercise 18 (45%) were engaged in moderate/heavy physical activity. Amongst subjects practicing physical exercise 50 (52.5%) subjects had family history of diabetes mellitus and 27 (39.7%) subjects were suffering from disease for less than 10 years.

In the current study, only 7 (17.5%) of the subjects were consulted physician before starting physical exercise. Regarding the practice of physical exercise, 33 (82.5%) subjects practised for more than 5 days a week and 31 (77.5%) practised for more than 30 min a day. Majority of the study subjects, i.e., 35 (87.5%) were practiced exercise outside among whom 20 (51.3%) practiced it in park and 13 (33.3%) on road and morning was the most preferred time to do physical exercise for 26 (65%) subjects (Table 2).

Table 2
Distribution of Physical Exercise (PE) Practices Among Elderly Diabetic Patients

<i>Variable</i>	<i>Category</i>	<i>Patients on PE (n=40)</i>
Physician consultation before starting PE	Yes	07 (17.5)
	No	33 (82.5)
Frequency of PE (days)	< 5week	07 (17.5)
	= 5/week	33 (82.5)
Duration of exercise/day	< 30 min	07 (22.5)
	= 30 min	33 (77.5)
Practices of PE (inside or outside the home)	Outside	35 (87.5)
	Inside	01 (02.5)
	Both	04 (10.0)
Place of PE* (outside the home)	Park	20 (51.3)
	Road	13 (33.3)
	Both	06 (15.4)
Time of exercise	Morning	26 (65.0)
	Evening	07 (17.5)
	Both	07 (17.5)
Distance covered during exercise	< 2 km	32 (80.0)
	= 2 km	08 (20.0)
Duration of Practice of Physical Exercise	< 10 years	28 (70.0)
	= 10 years	12 (30.0)

* No. subjects =39; Figures in parenthesis indicate percentages.

In this study, majority of elderly diabetes mellitus subjects had complications, co-morbidities and central obesity. Among the subjects practicing physical exercise, only 25 (36.8%) were suffering from diabetes mellitus complications, 30 (38.5%) and 21 (31.8%) had co-morbidities and central obesity respectively (Table 3).

Table 3
Distribution of Diabetes Complications, Co-morbidities and Central Obesity According to Physical Exercise

<i>Variable</i>	<i>Category</i>	<i>No. of subjects (n=102)</i>	<i>Subjects on PE (n = 40)</i>	<i>Subjects not on PE (n=62)</i>
Complication of DM	Present	68	25 (36.8)	43(63.2)
	Absent	34	15 (44.1)	19 (55.9)
Co-morbidities	Present	78	30 (38.5)	48 (61.5)
	Absent	24	10 (41.7)	14(58.3)
Central obesity	Present	66	21 (31.8)	45(68.2)
	Absent	36	19 (52.8)	17(47.2)

Discussion

The present hospital based exploratory research adopted the concept of physical exercise, a subcategory of physical activity which consists of structured, planned, repetitive body movement with the intent of improving physical fitness whereas physical activity is any bodily movement produced by skeletal muscles those results in energy expenditure (McDermott, A.Y, and Mernitz, H. 2004).

The current research found that 39.2 per cent of subjects currently practicing physical exercise. The Alexandra study observed that 55 per cent of the elderly type2 DM patients were engaged in physical exercise as walking (Plotnikoff, 2006). This finding clearly shows that, in the current study proportion of elderly subjects engaged in physical exercise is low. This could be due to lack of interest attributed to the poor public awareness and research based evidences regarding advantages of physical exercise in treatment of diabetes mellitus in elderly. The extensive literature review has shown that there is scarcity of research which specifically address the issue of physical exercise in elderly patients with diabetes mellitus and majority of times results were extrapolated from studies on young and non-diabetic subjects and also another review depicted that physical exercise related studies in diabetes were performed only in few selected countries in Asia such as Singapore, Iran and Japan and these justifies the utmost importance of future studies in India (Thent, *et al.*, 2013).

In the present research, every elderly patient was engaged in walking. The evidence shows that walking is a most popular, low impact, moderate intensity, aerobic exercise which requires little equipment, training and rarely associated with injury and easily adopted by elderly (Hosler, *et al.*, 2014). The studies have shown that walking has higher levels of adherence than other forms of physical exercise (Murtagh, *et al.*, 2010). It was shown that walking has definite benefit in diabetes mellitus by improving glycemic control as indicated by decreased HbA1c (Boule, *et al.*, 2001; Snowling, N.J and Hopkins, W.G 2006).

The current study shown, only 17.5per cent of the subjects were consulted physician before starting physical exercise. This could be due to lack of awareness among the subjects and reluctant attitude, lack of experience and expertise on the part of physician in addressing the issue of physical exercise during consultation. In India, there is an acute shortage of

exercise therapist (Patil, M. 2007). In this context, importance of physical exercise as a life style interventional tool, it should be incorporated in undergraduate/post graduate medical curriculum which will help the physician to provide appropriate and timely advice based on needs of the individual patient in future.

Regarding the practice of physical exercise, 82.5 per cent subjects practised for more than 5 days a week and 77.5 per cent practised for more than 30 min a day. The global recommendations for physical exercise for elderly by WHO in 2010 states that 30 minutes of physical exercise for five days is applicable to low and medium income countries and urge member nations to adopt culturally appropriate norms on physical exercise (WHO, 2010) and the Canadian Diabetes Association (CDA) in 2003 recommended Clinical Practice Guidelines for the Prevention and Management of Diabetes (Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, 2003). The above recommendations clearly show that there are no countries or organization specific recommendation on physical exercise regarding diabetes mellitus in elderly. In the light of increase in the prevalence of diabetes mellitus among elderly, there is a need for appropriate evidence based recommendation in India which include type, frequency, duration and intensity of physical exercise.

The current study found that 51.3 per cent of elderly subjects practiced in physical exercise in park and 33.3 per cent on public road. This could be due to the fact that the park is considered as a safest place of physical exercise for elderly compared to public road because of increased chances of accidents due to poor vision and mobility and poor quality of roads and non-adherence to traffic rules.

The present study found that among the subjects practicing physical exercise, only 36.8 per cent, 38.5 per cent and 31.8 per cent were had diabetes mellitus complications, co-morbidities and central obesity respectively. These observations have clearly shown that those subjects on physical exercise had reduced risk of complications, co-morbidities and central obesity.

The Japanese elderly diabetes intervention trial observed that physical exercise has significantly reduced macro-vascular complications such as cardiovascular and cerebrovascular events (Iijima, *et al.*, 2012). In a study conducted by Juan Carlos observed that reduction in central obesity among elderly diabetics who are on exercise (Ferrer-García, *et al.*, 2011). A study

has shown reduction in systolic blood pressure, triglycerides and waist circumference (Chudyk, A, and Petrella, R.J. 2011) and another similar study observed that a well designed exercise programme can be a effective treatment in reducing central obesity among elderly with type 2 diabetes (Tan, S. 2012), These evidences supports and strengthen fact that physical exercise definitely reduces the complications and co-morbidities associated with diabetes and also central obesity.

The present research even though limited by sample size, sampling technique and representativeness on elderly with type 2 diabetes mellitus added new information to the sparse literature available regarding practice of physical exercise among elderly with type 2 DM and recommend that there is a need to undertake in-depth, large representative sampled, multicentric studies in India to generate evidence to bring forth appropriate recommendations on physical exercise for elderly with type 2 diabetes mellitus and at the same time efforts needed to improve the awareness among patients and physician alike regarding the benefits of physical exercise as a life style modification tool along with diet and medications in the treatment of type 2 diabetes mellitus.

Conclusion

The present research found that 39.2 per cent of the elderly with type 2 diabetes mellitus were engaged in walking as physical exercise which needs to be confirmed by undertaking further in-depth research in India.

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Mini Nutritional Assessment Scale: An Assessment among the Elderly Chakhesang Population

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ABSTRACT

This paper attempts to assess the nutritional status of 912 elderly persons-Chakhesang elderly-(425 males and 487 females) with age ranging from 60 to 101 years, living in rural areas of Phek district, Nagaland. These elderly persons were administered anthropometry and Mini Nutritional Assessment (MNA) scale. This scale is a comprehensive tool designed and specifically developed for use with elderly people. The MNA is an 18 item protocol comprising of anthropometric measurements (BMI, mid-arm circumference and calf circumference) combined with dietary intake (number of meals consumed, food and fluid intake) and a self-assessment (self-perception of health and nutrition, weight loss, medication, feeding autonomy, mobility, presence of acute stress and presence of dementia or depression). According to the MNA scale, 1.6 per cent of the elders were found to belong to the 'malnourished' category with an MNA score of ≤ 17 while, 66.7 per cent of the elders belonged to the 'at the risk of malnutrition' category as defined by MNA scale of ≤ 23.5 . The percentage of elders who had 'normal nutritional status' with MNA score of ≥ 30 was found to be 31.7 per cent. On the contrary, according to BMI classification (WHO, 2004), 21.3 per cent of the elders belonged to the underweight category, 72.5 per cent were normal and 6.2 per cent were in the overweight category with negligible record of obese individuals in the

present study. This study revealed that there was significant difference between MNA and BMI on the assessment of nutritional status. BMI reference values for the evaluation of the nutritional status in older adults have been based upon extrapolations on studies using young adults or based on statistical definitions of threshold values, rather than on the elderly's morbidity, mortality and quality of life. Therefore, it is necessary to consider all of these factors to determine desirable threshold values for anthropometric measures in the elderly population.

Key words: Chakhesang, elderly, nutritional status, Mini Nutritional Assessment (MNA)

In a developing country like India, healthcare of the elderly has not received adequate attention from policy makers as they were pre-occupied with maternal and child health, communicable diseases, malnutrition and increasing population. For many older people with no savings, low wages, a lack of job security, poor health, no economic support from their children, just enough earnings to make ends meet, and little help from their friends and communities, old age is not a phase of life worth looking forward to (UNFPA, 2002). The National Policy on Older Persons, 1999 would perhaps be the first official document that outlined the Indian perspective on ageing. The policy defined 'senior citizen' or 'elderly' as a person who is of age 60 years and above. Well-being of older persons is the kernel of this policy. It accords high priority to health care needs of older persons and health services for them. In 2004, the 60th round of National Sample Survey Organisation (NSSO) studied condition and health care of the aged. The survey estimated that in the rural areas, every 1,000 persons in the working age have to provide support, physically or otherwise, to 125 aged persons (old age dependency ratio). Among states, the proportion of elderly persons vary from around 4 per cent in small states like Dadra & Nagar Haveli, Nagaland, Arunachal Pradesh, Meghalaya to more than 10.5 per cent in Kerala (MSPI, 2011).

Advancing age itself appears to be an inherent risk factor for malnutrition. The elderly are more prone to malnutrition because of the decreased nutritional reserve, multiple morbidities, the inability to acquire proper nutrition due to physical immobility and social isolation. Ageing is often consociated with factors such as loss of appetite, difficulties in intake of diet

due to poor dentition, and hence, the elders become increasingly vulnerable to malnutrition than the younger adults. As such, nutrition as a component of health and of treatment of disease in the elderly is dependent not only on knowledge of the nutrient requirements but also on the ability to effectively assess the nutritional needs of the elderly (Mathur, 2010). Proper nutrition poses as an indispensable component for an individual to age gracefully. Early detection and prompt interventions are all important for prevention of malnutrition among the elderly.

The present study was planned to find out nutritional status of Chakhesang elderly population living in rural areas of Phek district of Nagaland¹ (North East, India)

Materials and Methods

Sample

The study was conducted among 912 (425 males and 487 females) free-living rural Chakhesang elders who were between 60–101 years. The data collection was done in 20 Chakhesang villages under Phek district, Nagaland, viz., Enhulumi, Chizami, Kami, Khezhakeno, K. Basa, K. Bawe, Lekromi, Lasumi, Leshemi, Losami, Mesulumi, Pfutseromi, Phusachodu, Phuyoba, Rihuba, Sakraba, Thenyizu, Thetsumi, Thipuzu, and Zapami. Purposive sampling (because the selection of the elderly was dependent on the presence or absence of elderly participants in these respective locations) was taken into consideration to include those elders who were 60 years and above, who were mentally receptive and willing to participate in the study. Most aged individuals did not have an official record of their birth date; as such, the age was estimated by matching recall of particular historical events.

Tools Used

Mini-Nutritional Assessment (MNA) scale which is a comprehensive tool recently designed and specifically developed for use with elderly people was administered on these elderly for data collection. The MNA is an 18 item protocol comprising of (i) Anthropometric measurements (weight, height, mid-arm circumference, calf circumference and weight loss) combined with (ii) Dietary assessment (number of meals consumed, food and fluid intake and feeding autonomy), (iii) General assessment (life style,

mobility, medication, psychological) and a (iv) Subjective assessment (self-perception of health and nutrition). Based on the scores of the elderly persons were classified as Malnourished (MNA: 17) at risk of Malnutrition (17–23.5) and Normal Nutritional Status (24–30). And since the MNA uses a different classification of the BMI, BMI categories defined by WHO (2004) was also been considered for the purpose of comparison.

Martin's anthropometer, weighing machine and flexible non-elastic measuring tape were used for taking the anthropometric measurements according to techniques described by Weiner and Lourie (1981). Statistical analysis was done using SPSS version 16. 'p' value of 0.05 was considered statistically significant.

Results and Discussion

Table 1
Mini Nutritional Assessment (MNA)

<i>MNA</i>	<i>Male (%) (N=425)</i>	<i>Female (%) (N=487)</i>	<i>Total (%) (N=912)</i>
Malnourished (17)	3 (0.7)	12 (2.5)	15 (1.6)
at Risk of Malnutrition (17–23.5)	250 (58.8)	358 (73.5)	608 (66.7)
Normal Nutritional Status (24–30)	172 (40.5)	117 (24.0)	289 (31.7)

Source: 2011, Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc, Whitehouse Station, N.J. USA

Table 1 is a representation of the nutritional status of the Chakhesang elderly. The study revealed that majority (66.7%) of the elderly was at the risk of malnutrition where 73 per cent were females while 58.8 per cent were males. In the 'malnourished' category, 2.5 per cent were females while males constituted 0.7 per cent of the mentioned category. Only 31.7 per cent of the samples were found to belong to the category of normal nutritional status, out of which 40.5 per cent were males while 24 per cent were females. Overall, it can be deduced that females are more inclined towards malnourishment while males enjoy better nutritional status than females as the difference in the mean MNA score and level of association between the males and females was found to be statistically significant ($t=6.719$, $p\ 0.001$; $\chi^2=30.990$, $p\ 0.001$).

Table 2
Anthropometric Measurements

<i>Anthropometric Measurements</i>	<i>Male (%) (N=425)</i>	<i>Female (%) (N=487)</i>	<i>Total (%) (N=912)</i>
BMI*			
19 kg/m ²	106 (24.9)	143 (29.4)	249 (27.3)
19 to 21 kg/m ²	140 (32.9)	164 (33.7)	304 (33.3)
21 to 23 kg/m ²	101 (23.8)	111 (22.8)	212 (23.2)
≥23 kg/m ²	78 (18.4)	69 (14.2)	147 (16.1)
Mid-arm Circumference (MAC)**			
21 cm	24 (5.6)	71 (14.6)	95 (10.4)
21 to 22 cm	29 (6.8)	102 (20.9)	131 (14.4)
22 cm	372 (87.5)	314 (64.5)	686 (75.2)
Calf Circumference (CC)***			
31 cm	91 (21.4)	279 (57.3)	370 (40.6)
31 cm	334 (78.6)	208 (42.7)	542 (59.4)
Weight Loss			
3 kg	8 (1.9)	4 (.8)	12 (1.3)
Does not know	237(55.8)	337 (69.2)	574 (62.9)
1 to 3 kg	23(5.4)	12 (2.5)	35 (3.8)

Table 2 shows the anthropometric measurements and the self-assessment on weight loss during the past three months. In the BMI categorisation, majority of both males (32.9%) and females (33.7%) fall under BMI values between 19 to 21, while, individuals belonging to BMI value of 23 are least represented at 16.1 per cent. With reference to the mid-arm circumference (MAC), majority (75.2%) had MAC 22 cm, 14.4 per cent had MAC between 21–22 while those with MAC 21 cm was 10.4 per cent. Also, 40.6 per cent of the sample appeared to have a Calf circumference (CC) of 31 cm while the rest of the individuals had CC of 31 cm.

Table 3
Dietary Assessment

<i>Dietary Intake</i>	<i>Male (%) (N=425)</i>	<i>Female (%) (N=487)</i>	<i>Total (%) (N=912)</i>
Food Intake over the past 3 months			
Severe decrease	13 (3.1)	26 (5.3)	39 (4.3)
Moderate decrease	101 (23.8)	156 (32.0)	257 (28.2)
No decrease	311 (73.2)	305 (62.6)	616 (67.5)
Number of Meals Consumed per day			

Cont'd...

Cont'd...

1 meal	1 (0.2)	1 (0.2)	2 (0.2)
2 meals	96 (22.6)	97 (19.9)	193 (21.2)
3 meals	328 (77.2)	389 (79.9)	717 (78.6)
Selected Consumption Markers for Protein Intake (at least one serving of dairy products per day, legumes or eggs and meat per week, fish or poultry everyday)			
if 0 or 1 yes	215 (50.6)	260 (53.4)	475 (52.1)
if 2 yes	120 (28.2)	114 (23.4)	234 (25.7)
if 3 yes	90 (21.2)	113 (23.2)	203 (22.3)
Food and Fluid Intake			
Does not consume two or more servings of fruit or vegetables per day	86 (20.2)	66 (13.6)	152 (16.7)
Consume two or more servings of fruit or vegetables per day	339 (79.8)	421 (86.4)	760 (83.3)
3 cups of fluid per day	80 (18.8)	150 (30.8)	230 (25.2)
3 to 5 cups	167 (39.3)	193 (39.6)	360 (39.5)
5 cups	178 (41.9)	144 (29.6)	322 (35.3)
Feeding Autonomy			
Unable to eat without assistance	15 (3.5)	22 (4.5)	37 (4.1)
Self-fed with some difficulty	4 (0.9)	11 (2.3)	15 (1.6)
Self-fed without any problem	406 (95.5)	454 (93.2)	860 (94.3)

Table 3 summarises the dietary assessment for the past three months by the subjects through recall. No decrease in food intake has been reported among 67 per cent of the elderly while 4.3 per cent had severe decrease in food intake. Majority (78.6%) of the respondents reported that 3 meals were consumed per day while it was also revealed that a minimal per cent (0.2%) of the elders consumed only one meal per day. It was evidenced that the difference in the MNA scores and the number of meals taken in a day was statistically significant ($\chi^2=25.546$; $p < 0.01$), i.e., individuals who consume more meals per day had higher MNA scores. With regard to the selected consumption markers for protein intake, there were frequent reports of consuming at least one serving of dairy products per day (52.1%) whereas in addition to the dairy products, consumption of other protein rich food such as legumes or eggs and meat per week or fish or poultry everyday were less often reported. A significant difference was observed between the MNA and the protein intake ($\chi^2=96.567$; $p < 0.01$). Besides, 83.3

per cent consumed two or more servings of fruit or vegetables per day while a good percentage (39.5%) of the elders drink 3–5 cups of fluid per day and 35.3 per cent were reported to have been drinking more than 5 cups of fluid. With regard to the feeding autonomy, the elders appeared to be highly independent with 94.3 per cent of them reporting to have been self-fed without any problem.

Table 4
General Assessment

<i>General Assessment</i>	<i>Male (%) (N=425)</i>	<i>Female (%) (N=487)</i>	<i>Total (%) (N=912)</i>
Lives independently			
No	5 (1.2)	3 (0.6)	8 (0.9)
Yes	420 (98.8)	484 (99.4)	904 (99.1)
Pressure Sores or Skin Ulcers			
Yes	8 (1.9)	8 (1.6)	16 (1.8)
No	417 (98.1)	479 (98.4)	896 (98.2)
Medication (more than three prescription drugs everyday)			
Yes	10 (2.4)	12 (2.5)	22 (2.4)
No	415 (97.6)	475 (97.5)	890 (97.6)
Mobility			
Bed or chair bound	0	0	0
Able to get out of bed/chair but does not go out	52 (12.2)	56 (11.5)	108 (11.8)
Goes out	373 (87.8)	431 (88.5)	804 (88.2)
Presence of acute stress			
Yes	11 (2.6)	10 (2.1)	21 (2.3)
No	414 (97.4)	477 (97.9)	891 (97.7)
Presence of dementia or depression			
Severe Dementia or Depression	1 (0.2)	1 (0.2)	2 (0.2)
Mild dementia	18 (4.2)	11 (2.3)	29 (3.2)
<i>No psychological problems</i>	406 (95.5)	475 (97.5)	881 (96.6)

All of the elderly subjects live independently i.e., not in nursing home or hospital. None of the sample reported to be bed or chair bound. A substantial number of elderly (88.2%) reportedly goes out regularly while 11.8 per cent were able to get out of bed/chair but does not go out. With

regard to medication, it was revealed that 2.4 per cent of the elders were taking more than 3 prescription drugs everyday while the remaining percentage of the elderly were free of such regular medications. There were complaints of skin ulcers among 1.8 per cent while majority (98.2%) of them had no such problem. Furthermore, data on psychological health showed that 2.3 per cent of the elders had either suffered psychological stress or acute disease in the past 3 months. Severe dementia or depression was reported among 0.2 per cent; 3.2 per cent of mild dementia while majority (96.6%) of the elders reported to have had no psychological problems.

Table 5
Self-assessment

<i>Self-assessment</i>	<i>Male (%) (N=425)</i>	<i>Female (%) (N=487)</i>	<i>Total (%) (N=912)</i>
Self-Perception of Health			
Not as good	121 (28.5)	195 (40.0)	316 (34.6)
Does not know	33 (7.8)	46 (9.4)	79 (8.7)
As good	228 (53.6)	221 (45.4)	449 (49.2)
Better	43 (10.1)	25 (5.1)	68 (7.5)
Self-Perception of Nutritional Status			
Views self as being malnourished	2 (.5)	1 (.2)	3 (.3)
Is uncertain of nutritional state	213 (50.1)	260 (53.4)	473 (51.9)
Views self as having no nutritional problem	210 (49.4)	226 (46.4)	436 (47.8)

Reports of self-assessment or self-perceived health of the elders in comparison to their peers are presented in Table 5. A high percentage (49.2%) of elders consider themselves to have similar health status as their peers; 34.6 per cent felt that their health are not as good while 7.5 per cent are of the opinion that their health are better. Also, 8.7 per cent of the elders did not have an idea about their health status. As with regard to self-perception of nutritional status, more than half of the subjects (51.9%) are uncertain of their nutritional state; 47.8 per cent viewed themselves as having no nutritional problem while the elderly who considered themselves as being malnourished was 0.03 per cent.

Table 6
BMI Index according to WHO, 2004 categorisation

<i>BMI Categories</i>	<i>Male (%) (N=425)</i>	<i>Female (%) (N=487)</i>	<i>Total (%) (N=912)</i>
Under-weight (18.5)	78 (18.4)	116 (23.8)	194 (21.3)
Normal (18.5–24.99)	316 (74.4)	345 (70.8)	661 (72.5)
Over-weight (25–29.99)	31 (7.3)	26 (5.3)	57 (6.2)

Table 6 shows the BMI categorisations of the Chakhesang elderly. From the table, 21.3 per cent of the elderly belonged to the underweight category; 72.5 per cent were of normal BMI while those elders who were overweight accounted for 6.2 per cent. It may be mentioned again that individuals who were malnourished was found to be 1.6 per cent; at risk of malnutrition was 66.7 per cent and 31.7 per cent were categorised as belonging to normal nutritional status. In a study among free living elderly by Vedantam *et al.* (2010), 14 per cent were found to be malnourished as per the MNA scores whereby the BMI showed 32 per cent to be belonging to the underweight category. Further, the mean BMI between the males and the females was found to be significant ($t=910$, p 0.05). Females, to a greater extent, have lower BMI than their male counterparts which is diametrical to other studies which show females to have higher BMI because of the presence of more body fat. Successive studies have shown that with an increase in age, the MNA and BMI value decreases. In a study by Sharma (2012), it was observed that the age of the elderly males and females correlated significantly and negatively with the MNA scores. Such results of concurrent decline in nutritional status with advancing age were also reported by Baweja *et al.* (2008) and Yadav *et al.*, (2012). A negative and significant correlation was observed between age and MNA scores, both among the males ($r=-0.121$, p 0.05) and females ($r=-0.154$, p 0.001), while no significant correlations were observed between age and BMI, both among the males and females, in the present study. Further, a significant correlation was observed between MNA and BMI ($r=0.587$; p 0.001).

Table 7
Malnutrition as Defined by MNA, BMI (WHO) and BMI
(suggested by Sergi et al., 2005)

<i>Malnutrition Indicators</i>	<i>Male (%) (N=425)</i>	<i>Female (%) (N=487)</i>	<i>Total (%) (N=912)</i>	<i>Reference</i>
MNA 17	3 (0.7)	12 (2.5)	15 (1.6)	Merck Sharp & Dohme Corp, 2,011
BMI 18.5	78 (18.4)	116 (23.8)	194 (21.3)	WHO, 2004
BMI 20	183 (43.1)	217 (44.6)	400 (43.9)	Sergi et al., 2005

The BMI is often used for the purpose of nutritional surveillance. It is a simple but objective anthropometric indicator of the nutritional status of the adult population (Shetty & James, 1994). It is still an ongoing struggle for formulating an ideal BMI range for elderly and there is strong emerging evidence that WHO cut-offs may not be appropriate in advancing age. There has been a suggestion by some authors that BMI thresholds should be modified, say 20.0, by Sergi *et al.*, (2005). If in case that value is applied to the present population under study, the underweight or the malnourished category will be 43.9 per cent as against 21.3 per cent according to WHO (2004) classification, which is a likely overrated and an exaggerated figure. As such, in community-dwelling elderly persons, the MNA seems to be a more sensitive tool rather than the other screening parameters (BMI and serum albumin) in the assessment of nutritional risk in the elderly (Guigoz *et al.*, 2002; Menadi *et al.*, 2013). Also, it was seen that MNA versions that did not consider BMI seem to be more effective in singling out subjects with risk factors related to malnutrition (Donini *et al.*, 2013). BMI reference values for the evaluation of the nutritional status in older adults have been based upon extrapolations on studies using young adults or based on statistical definitions of threshold values, rather than on the elderly's morbidity, mortality and quality of life. Furthermore, there is some evidence that BMI differs according to ethnicity but WHO (2004) maintains that these cut-offs are not significantly different and, therefore, the standard WHO BMI classifications should be used in Asian, African, American and Polynesian people.

Discussion

Table 8
A Comparison of the Present Study with the Earlier Studies

Area of Research	Mini Nutritional Assessment (MNA)		Reference
	Malnutrition (%)	At risk of Malnutrition (%)	
Community Dwelling (rural)	1.6	66.7	Present Study
	1.0	–	Guigoz et al., 2002
Community Dwelling (urban)	1.3	25	Ribeiro et al., 2011
	5.53	42.1	Ghani et al., 2013
	10.40	37.52	Wason & Jain, 2011
Institutionalized	8.1	55.5	Jain et al., 2010
	5.1	60.3	Cairella et al., 2005
Geriatric Hospital	20	65	Hengstermann et al., 2008

In this study among the free-living rural Chakhesang elders, 1.6 per cent of the elderly were found to be malnourished according to the MNA scale. This result is similar to the cross-sectional study conducted by Ribeiro *et al.* (2011) among the community-dwelling Circiúma which revealed the prevalence of malnutrition at 1.3 per cent. The study is also in conformation to a study on more than 10,000 elderly persons where the mean prevalence of malnutrition is 1 per cent in community-healthy elderly persons (Guigoz *et al.*, 2002). On the other hand, the results seem to differ from those studies carried out in the urban setting. In a study by Ghani *et al.* (2013) among the older people in Sargodha city, it was revealed that 5.53 per cent were found to be malnourished while the malnourished percentage was 10.40 per cent among the elderly population in Jodhpur city (Wason & Jain, 2011). Studies conducted among the institutionalized elderly in Jaipur showed 9.1 per cent of malnourished individuals (Jain *et al.*, 2010). Those individuals belonging to the ‘at risk of malnutrition’ category was 66.7 per cent in the present study, similar to the study by Hengstermann *et al.* (2008) which was 65 per cent. Studies carried out by Cairella *et al.* (2005) observed 60 per cent to be at the risk of malnutrition; 37.52 per cent according to the study conducted by Wason & Jain (2011) and 42.10 per cent in Sargodha city (Ghani *et al.*, 2013).

It was also observed in the present study that females are more inclined towards malnourishment. ‘At risk of malnutrition’ was more prominent among the females (73.5%) as compared to the males (58.8%)

while 40 per cent of the males belonged to the 'normal nutritional status' category while the percentage among the females was 24 per cent. A similar situation was observed among the elderly of Jodhpur city (Wason & Jain, 2011) where 32.92 per cent males and 42.22 per cent females were at the risk of malnutrition and 54.73 per cent males and 49.15 per cent were well nourished. Overall, the MNA results showed more elderly to be 'at the risk of malnutrition' than the 'malnourished'. Other studies exhibit dissimilar results with the current study, showing males to be at a greater risk of malnutrition (Jain *et al.*, 2010; Ghani *et al.*, 2013). Similar findings have been seen among free-living elderly from India and other parts of the world. MNA is better at identifying those at risk of malnutrition among healthy elderly in the community (Guigoz *et al.*, 2002).

The present study was conducted in a rural setting. The main stay of the subjects is agriculture and as such the whole life revolves around cultivation. The diet is therefore predominantly rich in carbohydrates: like rice and allied items, varieties of tubers and pulses, etc. Hence, Table 3 (Dietary assessment) reports high intake of greens and fruits but a protein-energy deficient diet. Frequent meals and fluid intake were also reported. The elders are rarely sedentary unless they are critically diseased. Table 4 presents the general assessment which shows the elders to be highly mobile and seldomly undergoing regular medications. In the social sphere, elders are respected and revered, and regarded as the epitome of wisdom. Community and filial bonds are strong. Consequently, there were lesser reports of psychological problems such as stress, dementia or depression. Whoever had complained about psychological stress reportedly underwent loss of near or dear ones sometime before the study. An attempt was also made to associate the MNA scores with the dentition of the elders as the status of dentition determines the proper or improper mastication of food, which in turn affects the nutritional status. In this study, elders who had reported of using dentures (23.44 ± 0.35) scored highest in MNA scale followed by complete dentition (22.99 ± 0.16), partial dentition (22.21 ± 0.13) and worn out dentition (20.83 ± 0.21), difference between the means being statistically significant ($F=24.842$, $p 0.001$).

Although the Chakhesang elders were seen to consume a carbohydrate-rich diet, lead healthy lifestyles (regular physical activities, comparatively low percentage of smoking (9.1%) and drinking (5.4%)), are highly independent and less reports of psychological stress, the MNA scores reflected a lesser percentage (31.7%) of elders belonging to the

‘normal nutritional status’ category and a comparatively high percentage (66.7%) belonging to the ‘at risk’ category. One of the contributing factors could be their low protein intake. Dairy products are uncommon among the rural population. Also, except during festivities, access to meat and fish are limited as they are not available in the immediate neighbourhood. After heavy physical exertions, it is often recommended that a high-quality protein source (like meat, fish or poultry, dairy, eggs and legumes like beans and lentils) combined with a carbohydrate meal should be consumed to help maintain the body’s protein balance, more particularly for elder adults. But, this kind of intake was deficient among the elders. There is no question of intake of dietary supplements. As such, the malnourishment/at risk individuals did not lack in ‘quantity’ of food but the problem remained with the ‘quality’ of food. Beginning at approximately 50 years of age, humans begin to gradually lose skeletal muscle (sarcopenia) which is common in the elderly. Hence, in order to cope with the process of ageing and also to compensate for the heavy physical activities, it is important for the older people to eat high-quality protein foods as proteins are sources of energy and are vital for maintenance of body tissue, development and repair.

Note

1. The State of Nagaland was formally inaugurated on December 1st, 1963 as the 16th state of the Indian union. It is bounded by Assam in the West, Myanmar in the east, Arunachal Pradesh and part of Assam in the North and Manipur in the South. The State consists of eleven administrative districts, inhabited by 16 major tribes along with other sub-tribes. Chakhesang constitute one of the major tribes. Each tribe is distinct in character from the other in terms of customs, languages and dresses. The state approximately lies between 25E6’ and 27E4’ latitude, north of equator and between the longitudinal lines 93E20’E and 95E15’E. The 2011 census of India report recorded the total population at 19,78,502 and it was found to be the only state in the country to record a decrease in population with –0.58 per cent decadal growth since 2001.

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Association Between Social Participation and Self-rated Health Among Older Adults in Pune (Maharashtra)

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ABSTRACT

The present cross-sectional survey was aimed to investigate the association between social participation and self-rated health and characteristics of randomly selected 1,124 respondents of both the sexes (Male=494 and female=631) of age varying from 60 years and above, from Western city of Pune, (India). A semi-structured interview schedule to collect data was used in this study. The schedule was comprised of socio-demographic information, self reported health and reporting of chronic diseases, physical activities, social participation and social support system. Interviews were taken at the residence of the respondents. Cross-tables with chi-square tests and Fisher exact test with odds ratio were calculated. Association between various demographic variables and social participation was checked using Chi-square test. It was found that the social interaction with relatives, participation in recreational activities, religious activities and voluntary work was associated with male, married, literate individuals and among those who reported no chronic illness. They undertook regular physical activity and reported self rated 'good' health status. Chances of increased interaction with relatives, participation in recreational activities, and volunteering/other activities were more among those respondents who reported 'good' health status. The present findings emphasized the importance of maintaining social participation, even with declining functional status, as it may have health protective benefits.

Keywords: Self-rated health, Social participation, India, older adults, Pune

Social participation is a key determinant of successful and healthy ageing and therefore an important emerging intervention goal for health professionals (Levasseur *et al.*, 2010). Social relationships are essential for old people as they experience transition in social roles (Betts, *et al.*, 2011; Escobar-Bravo, *et al.*, 2012). Studies suggest that higher levels of social participation are associated with lower morbidity and mortality rates and have positive impact on well being and overall quality of life of elderly (Glass, *et al.*, 2006; Lee, *et al.*, 2008; Holmes & Joseph, 2011; Arokiasamy, *et al.*, 2012). In other words, lack of social participation is a risk factor for physical and mental health problems and socially detached and lonely individuals tend to suffer higher rates of morbidity and mortality (Cacioppo, *et al.*, 2006; Nicholson, 2008). Low social participation is perhaps a pathway through which relative deprivation occur in terms of emotional support, information channels, which is likely to influence health. It is believed that people who are more involved in their communities have greater support and good health status. People who take part in group activities such as religious activities, social gatherings; family functions may reap benefits in terms of health (Kawachi, *et al.*, 1999). Social interaction and participation protect against social isolation and its negative effects on health (Rocco & Suhrcke, 2012).

Self-rated health is an important measure of a person's health status in general (Idler & Benyamini, 1997). High level of social participation is associated with better self-rated health (Veenstra, 2000). Poorer self-rated health in the older population is associated with lack of social participation in some studies (Pollack & Knesebeck, 2004).

Social Participation and Older Adults in India

Demographic transition coupled with public health reforms have resulted in significant change in the shape and structure of the age pyramid of India. The number of people above 60 is expected to triple by 2050 from current 92 million to 316 million, constituting nearly 20 per cent of the population in India (Ravishankar, 2010). Demographic transition is accompanied by the changes in lifestyle, world outlook and the relationships in the society. The emergence of nuclear family, absence of traditional caretakers and support systems forced change in the status and lifestyle of elderly. This shift has changed the traditional position and role of older adults in the

family and society. They have gradually moved from the centre to the periphery (Nair, 2014) in various areas of social life. Their visibility on social platform has declined substantially. Therefore, present study aimed at studying the level of social participation of older adults and to investigate if there is any association between social participation and self-rated health in the study population.

Methods

Sampling method and sample size: The study uses cross sectional research design. Data were collected during June 2010 to June 2012 among individuals aged 60 and older from the city of Pune located in Western parts of India. Sample in the study has been drawn using a multistage random sampling method. There are 14 administrative wards in the city of which 11 wards have been used in the sampling design. One sub-ward from each administrative ward selected randomly and data was collected starting from the northeast corner of the sub wards. Respondents were selected randomly from each sub ward using population proportion sample technique. The total sample size is 1,140 individuals above 60 years of age. These respondents are part of a longitudinal study of the University department, entitled 'predictors of functional ability among elderly'. The Institutional Ethics Committee approved the study and written informed consent was obtained from all participants prior to the data collection.

Tool Used

The trained interviewers used pretested semi-structured interview schedule to collect data. Interviews were taken at the residence of the respondents. The schedule was comprised of socio-demographic information, self reported health and reporting of chronic diseases, physical activities, social participation and social support system.

Definitions of Variables

Social participation: Following items are used to assess social participation level (1) casual interaction with neighbours (2) interaction with relatives (3) participation in recreational activities (4) participation in religious activity (5) volunteering/service to society and the response categories were (a) never (b) occasional (c) frequent during last 12 months period.

Self rated health: Self-rated health was assessed by the question: “How would you rate your health?” Answer was dichotomized between good (excellent/good) and Poor (fair/poor). This measure has been recommended for international overviews and comparisons and is a reliable and valid indicator of general health and well-being (Sturgis, *et al.*, 2001). Self-rating of health has been correlated with more objective measures like presence of acute and chronic diseases.

Data analysis: Cross-tables with chi-square tests and Fisher exact test with odds ratio were calculated to assess the association between self-rated health and social participation. Association between various demographic variables and social participation was checked using Chi-square test. All statistical analyses were performed using SPSS for Windows (version 19.0).

Results

Description of the population: Table 1 describes the demographic characteristics of the sample. Fifty six per cent of the respondents were female gender. Nearly two third (66.9%) respondents were between 60 to 70 years of age and the median age was 67 years. Almost, 27 per cent were widowed, one third of the sample population had not received any formal education, and one fourth of the sample population were economically dependent on their children for daily expenses. Presence of chronic illness was reported by nearly 60 per cent of the respondents. Commonly reported illnesses were hypertension, diabetes, arthritis, joint problems, asthma, respiratory disease, heart related ailments. Nearly half of the respondents (48%) were engaged in some form of physical activity; walking, Yoga, cycling, etc. Thirty-five per cent of the respondents reported ‘poor’ self-rated health.

Table 1
Characteristics of the Study Population

<i>Socio-demographic Characteristics</i>	<i>N(%)</i>	<i>Socio-demographic Characteristics</i>	<i>N (%)</i>
<i>Age group</i>		<i>Economic dependence</i>	
60–64 years	363(32.4)	Dependent	270(24.0)
65–69 years	386(34.5)	Independent	855(76.0)
70–74 years	306(27.5)	Physical activity	
75 years and above	64(5.7)	Yes	540(48.0)
Sex		No	565(50.2)

Cont'd...

Cont'd...

Male	494(43.9)	Presence of chronic illness	
Female	631(56.1)	Yes	665(59.1)
Marital status		No	460(40.9)
Married	819(72.8)	Perceived health status	
Separated/widowed/unmarried	306 (27.2)	Good	733 (65.4)
Education		Poor	388 (34.6)
Illiterate	332(29.5)		
Literate	793(70.5)		

Self Rated Health Status

Self-rated health was used as a dichotomous category, good and poor. Table 2 present association of self rated health by demographic and other characteristics of the respondents. Health was self-rated as good by 71 per cent of men and 60.5% of women. The reported good health varied greatly by gender; women respondents showed poorer self rated health as compared to men respondents (OR 1.628(95% CI: 1.264–2.096). Those respondents who were without spouse, had no schooling, reported the lowest rates of good health as odds for poor health was OR 1.625(95% CI: 1.240–2.130) and OR 0.286(95% CI: 0.219–0.374) respectively. Greater participation in physical activity was associated with higher self-rated good health (OR 2.923(95% CI: 2.252–3.795). Presence of chronic illness led to higher chances of reporting poor self-rated health (OR 0.310(95% CI: 2.35–0.408). Age and economic dependency did not show any association with self rated health status.

Table 2
Odds Ratio for Self-rated Health and Respondents Characteristics

Characteristics	Frequency N(%)	Self rated Health		p-Value	OR (95% CI)
		Good	Bad		
Age_group					
60–67 years	606 (53.9)	399	205	0.61	1.066(0.833–1.365)
Above 67 years	518 (46.1)	334	183		
Sex					
Male	494(43.9)	351	140	0.0*	1.628(1.264–2.096)
Female	631(56.1)	382	248		

Cont'd...

Cont'd...

Marital status					
With spouse	819(72.8)	558	257	0.001**	1.625(1.240–2.130)
Without spouse	306(27.2)	175	131		
Education					
Illiterate	332(29.5)	149	183	0.0*	0.286(0.219–0.374)
Literate	793(70.5)	584	205		
Economic dependence					
Dependent	270(24.0)	181	88	0.463	1.118(0.836–1.495)
Independent	855(76.0)	552	300		
Physical activity					
Yes	540(48.8)	417	122	0.05*	2.923(2.252–3.795)
No	565(50.2)	304	260		
Presence of chronic illness					
Yes	665(59.1)	366	296	0.05*	0.310(2.35–0.408)
No	460(40.9)	367	92		

* Significance at p=0.05 **Significance at p=0.001

Social Participation of the Respondents

Informal, relax interaction with neighbours was reported by almost everybody. However it was significantly more among illiterate, economically dependent and those who did not participate in any physical activity ($p=0.001$). Age, gender, marital status and current illness did not show any association with interaction with neighbours. Interaction with relatives involved informal visit to the relatives or relatives dropping in as visitors. It was significantly associated with younger age, literacy, physical active, and among those who reported absence of chronic illness ($p<0.00$). Participation in recreational activities included playing cards or carom or other board games with friends, membership of any local club, participation in recreational sports, playing any musical instrument (harmonium, table), part of a singing group (bhajani mandal), etc. Such recreational participation was significantly more among those respondents who were married, male gender, literate, reporting absence of chronic illness, and who performed physical activity regularly ($p<0.00$). Age and economic status was not associated with participation in these activities. Participation in religious activities was observed across all participants irrespective of their

characteristics. Participation in voluntary work organized by senior citizen club, housing society or volunteer's bureau of the city was also reported. Participation was significantly ($p < 0.00$) more among males, married, literate and economically independent respondents and those who report absence of chronic illness.

Self Rated Health and Social Participation

Table 3 presents the result of association between self-rated health status and social participation. Interaction with neighbours was not influenced by self-rated health status. Chances of increased interaction with relatives, participation in recreational activities, and volunteering were more among those who reported 'good' health status as indicated by the odds ratio (OR 2.51 (95% CI: 1.88, 3.35), OR 2.06 (95% CI: 1.61, 2.65) and OR 1.57 (95% CI: 1.21, 2.04) respectively. Respondents who did not participate in religious activities had higher odds (OR 1.37 95% CI: 0.55–0.94) of rating their health as 'good'.

Table 3
Association of Social Participation with Self Rated Health Status

	<i>Total</i>	<i>Self rated health</i>		<i>p-Value</i>	<i>OR(95% CI)</i>
<i>Social Participation</i>	<i>N(%)</i>	<i>Good</i>	<i>Bad</i>		
Interaction with neighbours					
Yes	867 (77.5)	557	310	0.17	0.810 (0.599–1.095)
No	251(22.4)	173	78		
Interaction with relatives					
Yes	872(78.0)	612	260	0.0*	2.512 (1.881–3.354)
No	246 (22)	119	127		
Participation in religious activities					
Yes	727(65.01)	457	270	0.01*	0.726(0.558–0.945)
No	393(35.1)	275	118		
Participation in recreational activities					
Yes	576(51.5)	422	154	0.0*	2.068(1.610–2.658)
No	544(48.6)	310	234		
Volunteering/service to society					
Yes	416(37.2)	298	118	0.001**	1.575(1.212–2.046)
No	703(68.8)	433	270		

* Significance at $p=0.05$ **Significance at $p=0.001$

Discussion

Overall, degree of social participation was greater in men as compared to women, married as compared to widowed or unmarried, educated and economically independent, physically active individuals and those who did not report chronic illness. Two possibilities are indicated by the results obtained from this study. The first possibility is respondents with 'good' health participated in social life. However, respondents reporting 'poor' self-rated health have participated in all aspects of social life. It is evident from table 3 that the proportion of participation of 'poor' self rated health participants' in following domains; interaction with neighbours (79.9%), interaction with relatives (67%) and participation in religious activities (69.5%) was almost near to the reported numbers of 'good' self rated health respondents. Participation in voluntary work (30.4%) and recreational activities (39.6%) was reported very low as compared to the other group.

The other possibility is people who were more involved in their social life received greater benefits in terms of overall well being as a result they rated themselves in 'good' health category. As described by Berkman and Kawachi (2000), social participation offers emotional support, personal fulfilment, and satisfies information needs.

One of the important observation of the study is gender difference. The results of this study confirmed the findings from other studies that a higher proportion of older women reported poor self-rated health compared with men in India (Agrawal & Arokiasamy 2010, Rahman & Liu 2000). Presence of chronic condition and other somatic health problems are associated with poor self rated health in women (Caetano *et al.*, 2013). Data from Indonesia suggested that women who report bad self rated health have a higher mortality risk than men (Ng *et al.*, 2012). Therefore, improvement in health and functional status of women is recommended. Women respondents showed poorer health, poorer participation in recreational activities and volunteer work as compared to men. Similar observations are recorded in Nepalese women. Women's participation in recreational activity (playing cards which is a very common activity in Nepal) was much less as compared to men mainly because they were more engaged in household activities and did not find time for socializing (Gautam, *et al.*, 2007). In present study nearly 75 per cent were part of the extended family, staying usually with married sons and grandchildren. In such households they shared the household chores and cared for

grandchildren. Such living arrangements are beneficial especially for their economic wellbeing and support. However, as Cheng and colleagues (2000) have documented that lower social participation may easily lead to social isolation of women because of household and family responsibilities. Thus, efforts to increase women social participation and reduce burden of household activities is essential.

Participation in religious activities is also an important activity for older adults in India. Attending religious services and participating in groups where religious activities (choir, prayer group) or discourses are delivered have demonstrated helpful effects on the health of the elderly in Canada (Veenstra, 2000). The findings about recreational activities were similar to the Spanish and Swedish study in which studies older adults spent time chatting with neighbours, interacting with friends, watching television or resting, and socializing (Silverstein & Parker, 2002; Triado, *et al.*, 2009). Watching television was the most prevalent leisure activity among community-dwelling older adults in Hong Kong (Cheung, *et al.*, 2009). In Poduchery (Rajan & Sarchandraraj, 2005) those who participated in social and recreational activities were more likely than those who did not participate in such activities to report positive self-perceived health. Thus, our results can be corroborated with other studies about self rated health and social participation.

Limitations

The research emphasises physical presence in the company of others, face-to-face interaction. We didnot include social activities like use of telephone and cell phone or internet, visiting social networking sites or other social media. Studies in the developed nations have shown useful effect of internet use and on levels of loneliness (Veenhof & Timusk, 2009; Sum, *et al.*, 2008). Another difficult is quantification of social participation. Social participation was not categorized by the frequency of interaction or number of times participated but by a subjective assessment. Lastly, but most importantly because this was a cross-sectional study, the possibility of reverse causality cannot be ruled out; that is, people in poor health may be unable to maintain social participation, and those who participate frequently may be in better health. Nonetheless, the association between social participation and self-rated health status persisted.

Conclusion

Despite some limitations, our study presented several features, which were not included in previous studies. First, our data were cross-sectional and therefore disqualified for drawing any inferences regarding causation. Because there was a possibility of reverse causality, i.e., decreased social participation resulting from poor health, the observed association between social participation and self-rated health may be a mixture of these effects. A prospective cohort study to examine this effect is necessary in India. Yet, our results emphasized the importance of maintaining social participation, even with declining health, in the older adults. We examined the relationship between social participation and health status. Further study is required to identify the mechanisms by which social participation influences the health of elderly people.

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Gender Differentials in Chronic Morbidities and Related Issues among Urban Elderly

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ABSTRACT

The present study was conducted to examine the prevalence of elderly suffering from selected morbidities, duration of years they suffered and treatment taken or not for one or the other morbidity under consideration from any health facility across their gender background. For this purpose, data from 778 elderly persons (364 men and 414 women) who were residing in Coimbatore city, Tamil Nadu, was collected and analysed with the help of cross-tabulations/means and Chi-square/ANOVA tests. The findings revealed that the percentages of elderly suffering from Arthritis and Cataract and related closely followed by Blood Pressure, Diabetes, Back pain and Asthma are higher among women than among men. On the other hand, while the duration of years suffering from Cataract and related, Arthritis, Blood Pressure Asthma and Ulcer problem is significantly higher among men than their women counterparts, the reverse pattern is noticed in the case of Diabetes. By and large, men tend to availed/ availing medical treatment for majority of the chronic morbidities under consideration to a large extent than their women counterparts. Based on the findings suitable policy implications were proposed and discussed.

Key words: Gender differentials, Elderly, Chronic Morbidity, Gender

With an increase in aged population (60+ years) in most of the less developed countries in the World, women are going to live longer than their men counterparts and thereby, they have longer period of exposure to one

or the other diseases. Due to this, women are more likely to suffer with chronic morbidities for a longer period of time, besides negligence in treatment taking for the diseases from which they suffer. Several studies around the world give the picture of near-constant female excess in morbidity persist, in part because few studies examine gender differences across health measures by age (Gorman and Read, 2006). Likewise, it has been observed that in most societies across the globe women tend to report higher levels of depression, distress, and chronic illness (McDonough and Walters, 2001). Some argued that women report higher levels of health problems because of their reduced access to material and social conditions that foster health and from the greater stress associated with their gender and marital roles (Singh *et al.*, 2013). Furthermore, when it comes to duration of years suffered with various morbidities, one can observe that men tend to suffer for a longer period since they are more exposed to hazardous environment outside home, work and public places as compared to women. Of course, one need not deny the fact that women live in urban areas nearby factories the outlet polluted gases also more likely to suffer even they restrain themselves to home. With regard to taking treatment one can postulate women generally tend to go for health facility for medical and health services to a lesser extent than their men counterparts, as men being the breadwinners/major decision makers at the family level, besides

In Indian context, a few studies have been carried out in urban areas/settings have highlighted about the prevalence/magnitude of chronic morbidities among elderly persons and medical/health facilities availed or utilised by them. Joshi *et al.*, (2003) among 200 elderly in Chandigarh city and a rural area of Haryana state found that a greater percentage (89%) of them reported one or the other illness (91% women and 84% men). The majority of them (43%) were diagnosed as having 4–6 morbidities, 23 per cent had 7–9, 1.5 per cent had a maximum of 13 and only 0.5 per cent had no morbidity. The mean number of morbidities among male elderly was 5.9 compared with 6.4 among females ($p < 0.05$). Among those who perceived themselves as ill (177), 44 per cent sought treatment/taken medicines at the time of survey; females marginally higher than males (48% vs. 42%). The most prevalent morbidities among elderly persons were anaemia, dental problems, hypertension, chronic obstructive airway disease (COAD), cataract and osteoarthritis (in the range 67%–33%). Most of the morbidities were common in rural areas except for hypertension (56%) and

osteoarthritis (34%). Based on a cross-sectional study among 300 elderly persons residing in an urban area of Udaipur, Rajasthan, Prakash *et al.*, (2004) stated that cataract (70%) was the most common morbidity from which the elderly suffered followed by hypertension (48%), respiratory diseases (36%) and musculo-skeletal diseases (15%). It was also conspicuous to note that except the respiratory diseases (41% in men and 27% in women), other three morbidity conditions were higher among women than men (75% & 67%, 55% & 44% and 20 & 12%, respectively).

In a cross-sectional community-based study among elderly – 293 from Dibrugarh city and 230 from tea garden community, Assam – Medhi *et al.*, (2006) observed that among both tea garden and urban elderly, hypertension (81% and 69%, respectively) closely followed by musculoskeletal (68% and 63%), respiratory problems (32% and 30%) and cataract (33% and 40%) were major health problems. Gender differentials in these regard were neither consistent nor significant. About two-fifths (39%) of urban as against 8 per cent of tea garden elderly only used health services during the preceding one year of the survey. Bhatia *et al.*, (2007) in their study among 362 aged persons (65+ years) from Chandigarh Union Territory observed that a greater percentage of the elderly (86%) reported to be suffered from one or more health-related problems, with an average of two illnesses. Illness was higher among females (60%) as compared to males (41%). The main health-related problems among the aged were those of circulatory system (hypertension and heart attack – 50%) closely followed by musculo-skeletal system (48%), connective tissues disorder (46%), cataract (19%) and diabetes mellitus (12%). Hypertension as well as diabetes mellitus were significantly ($p < 0.05$ in both the cases) more in females (46% and 18%, respectively) than males (35% and 6%, respectively). With a few exceptions, such gender differentials were more prominently noted among those who belong to 65–74 years, but negligible in 75+ years age group. While analyzing the NSSO's 60th round data for Kerala state, Mini (2009) noted that about 16 per cent of elderly persons were suffering from at least one acute disease (15.9% in males and 17.2% in females) and little over 47 per cent were suffering from at least one chronic disease (47.6% in males and 47% in females) at the time of survey. Hypertension was reported to be the most prevalent disease among both males and females (12.4% and 18.6%) followed by disorders of joints and bones (6.9% and 14.9%), diabetes mellitus (20% and 14.3%) and asthma (3.8% and 3.7%).

A study among 360 community dwelling urban elderly (65+ years) from middle socio-economic strata in Bangaluru (Srinivasan *et al.*, 2010) revealed that a greater majority (85%) reported to be suffering from medical problems. Hypertension was reported by majority of the elderly (49%) followed by diabetes (32%) and arthritis, coronary heart disease and genito-urinary diseases (28% in each case). While diabetes and hypertension were equally prevalent in both genders, arthritis was significantly more common among women. About fifty per cent of them made 3 or less physician visits and 13 per cent were hospitalized for health related problems during 1 year preceding the survey. In another study carried out among 100 elderly residing in an urban slum of Pune city, Pandey and Deshmukh (2010) observed that cataract was the most common morbid condition (68%) among the elderly followed by musculoskeletal disorders (53%) and hypertension (27%). A large majority of the sample elderly utilized the medical and health services from urban health training center attached to a Medical College in Pune, whereas about three-tenths of them (29%) availed such services from private practitioners and just about 3 per cent from municipal hospital. All these reviews highlight the fact that the prevalence of majority of morbidities is higher among elderly women than their men counterparts.

Objectives

The following are the major objectives of the present study:

1. To study the magnitude of chronic morbidities from which the elderly persons are suffering across their gender background in Coimbatore city, Tamil Nadu.
2. To understand the duration of years suffering from chronic diseases by the elderly persons across their gender background in Coimbatore city, Tamil Nadu.
3. To know whether those elderly persons who are suffering from chronic morbidities have taken treatment or not across their gender background in Coimbatore city, Tamil Nadu.

Data and Methods

Data for the present paper was drawn from an ICSSR sponsored research project entitled 'Care Giving to the Urban Elderly across their Living Arrangements: A Study in Coimbatore City, Tamil Nadu'. The sample frame for this survey was 4 wards (out of 72 wards) in Coimbatore

Municipal Corporation (CMC), which have been selected based on their literacy rates (one of the best indicators of social development) – 2 wards from those which have comparatively higher literacy rates; 96.4 and 94.0, and 2 wards from those which have lower literacy rates; 80.3 and 80.0 – according to 2001 census on simple random basis. Out of these four wards, 8 clusters (streets or parts of streets), comprising of about 1,000 population each, were selected on simple random basis. The sample size intended to collect was fixed about 800 elderly persons (60+ years in age), which was thought to distribute equally among the 8 clusters out of four wards. Finally, the data was collected, through interview schedule, from 778 elderly persons of which 364 were males and 414 were females (Audinarayana, 2012).

In the present paper, an attempt was made to analyse the elderly persons' chronic morbidity status, which was measured by asking the respondents for about 13 morbidities; of which 9 morbidities (from whom at least 5 per cent of them were suffering at the time of survey) were analysed. Next to this, the duration of years from which the elderly persons were suffering from these 9 morbidities was computed based on mean no. of years (duration). Likewise, whether the elderly took treatment or not it was analysed among those who were suffering from the said chronic morbidities. Further, since the major intension of the study was to understand gender differentials, in any, in the selected phenomenon, all these analyses were carried out across their gender background. Simple percentage and cross-tabular analyses with Chi-square test as well as mean and one-way ANOVA were the statistical tools used here. All these analyses were done making use of SPSS software (Version 22.0).

Results and Discussion

Magnitude of Elderly Suffering from Different Chronic Morbidities by their Gender

Information about the prevalence of different chronic morbidities among the urban elderly persons across their gender background is provided in Table 1. On the whole, it is observed that majority of the elderly suffering from poor vision/cataract related problems and rheumatism/arthritis followed by blood pressure. Some are suffering from the chronic morbidities like diabetes, back pain/slipped disc and asthma/lung problems. Few of them only suffer from heart problem, ulcer/gas problem and dental problems. It is conspicuous to note that the

elderly women invariably suffering from almost all the said chronic morbidities to higher extent than their men counterparts, except in the case of ulcer/gas problems. However, it is interesting to note that such gender differentials in chronic morbidities are strikingly large and the chi-square test results also turned out as highly significant ($p < 0.001$) in the case of poor vision/cataract, rheumatism/arthritis and back pain/slipped disc, whereas somewhat large (and significant) in the case of blood pressure ($p < 0.05$), dental problems ($p < 0.01$) and lung problems/asthma ($p < 0.10$). As noted earlier, elderly persons suffering from ulcer/gas problems is higher among men as compared to their women counterparts, which is also turned out as moderately significant ($p < 0.05$). On the whole, 75 per cent of the elderly are suffering from one or the other chronic morbidities under consideration. As expected, such percentage is higher among women (81%) as compared to their men counterparts (69%) and the chi-square test results also turned out as highly significant ($p < 0.001$).

Table 1
Percentage Distribution of the Elderly Suffering from Chronic Morbidities by their Gender Background

Chronic Morbidities	Gender				Total	
	Male		Female			
	%	No.	%	No.	%	No.
Poor Vision/Cataract***	36	131	49.3	204	43.1	335
Rheumatism/Arthritis***	31	113	50.5	209	41.4	322
Blood Pressure*	25.3	92	31.6	131	28.7	223
Diabetes	15.9	58	17.4	72	16.7	130
Back Pain/Slipped Disc***	9.1	33	19.8	82	14.8	115
Lung Problem/Asthma+	9.9	36	15.5	64	12.9	100
Heart Problem	8	29	9.2	38	8.6	67
Ulcer/Gas Problem*	11.3	41	7.5	31	9.3	72
Dental Problem**	3	11	7	29	5.1	40
Suffering from One or more Chronic Morbidities***	68.7	250	80.9	335	75.2	585

Note: +, *, ** and *** = The Chi-square test results for each of the morbidity across their gender background are significant at 0.10, 0.05, 0.01 and 0.001 levels, respectively

Duration of Years Suffering from Different Chronic Morbidities by Gender

Data related to the duration of years suffering from different chronic morbidities among the urban elderly persons across their gender background is given in Table 2. By and large, one can notice that the

duration of years (mean no. of years) elderly suffering from different chronic morbidities is higher for diabetes (8.2 years) closely followed by lungs problem/asthma (7.1), blood pressure (6.2), which are noted as chronic among general population too in the recent past. Next in that order are: heart problem, ulcer/gas problem, poor vision/cataract. Such duration of suffering is comparatively less in the case of chronic diseases like dental problems, back pain/slip disc and rheumatism/arthritis. Gender differentials in the mean number of years suffering from the chronic diseases under consideration are noteworthy. Out of the 9 chronic morbidities, the mean number of years suffering from 6 morbidities is higher among elderly men as against women and in the case of remaining 3 morbidities the reverse pattern is noticed. However, the one-way ANOVA results highlighted that such gender differences (higher for men compared to women) in the mean duration of years suffering from chronic morbidities is much higher and turned out as highly significant ($p < 0.001$ or $p < 0.01$) for ulcer/gas problem, rheumatism/arthritis and lung problem/asthma, whereas such differences are moderately significant for poor vision/cataract and blood pressure and also for diabetes mean years is higher for women as against men – $p < 0.05$).

Table 2

Distribution of Elderly by Mean Duration of Years Suffering from Chronic Morbidities across their Gender Background

Chronic Morbidities	Gender				Total	
	Male		Female			
	Mean	N	Mean	N	Mean	N
Poor Vision/Cataract*	5.97	131	4.79	204	5.25	335
Rheumatism/Arthritis**	4.57	113	3.63	209	3.96	322
Blood Pressure*	6.95	92	5.66	131	6.19	223
Diabetes*	7.04	57	9.08	73	8.18	130
Back Pain/Slipped Disc	4.21	33	4.3	82	4.28	115
Lung Problem/Asthma**	8.56	36	6.2	64	7.05	100
Heart Problem	5.41	29	6	38	5.75	67
Ulcer/Gas Problem***	6.73	41	4.35	31	5.71	72
Dental Problem	4.45	11	4.28	29	4.33	40

Note: *, ** and *** = The one-way ANOVA test results for each of the morbidity across their gender background are significant at 0.05, 0.01 and 0.001 levels, respectively

Extent of Elderly Taking Treatment or Not for Different Chronic Morbidities by their Gender

Table 3 highlights the information about the extent of elderly persons taken/taking treatment for various chronic morbidities under consideration

across their gender background. Among the total sample elderly, one can see that almost all of those who suffered/suffering from heart problem (96%) have taken treatment from one or the other health facility closely followed by a greater extent in the case of ulcer/gas problem (86%) and diabetes (77%). Elderly persons have taken treatment for diseases like dental problem (53%) closely followed by poor vision/cataract (58%) comparatively to an average extent. The percentages of elderly who have taken treatment for the other morbidities under consideration fall in between these two extremes.

Table 3

Percentage Distribution of the Elderly by Whether Treatment for Chronic Illness is Taken or Not Across their Gender Background

<i>Chronic Morbidities/Treatment Taken or Not</i>	<i>Gender</i>				<i>Total</i>	
	<i>Male</i>		<i>Female</i>		<i>%</i>	<i>N</i>
	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>		
Poor Vision/Cataract*	100	131	100	204	100	335
Treatment Taken	64.9	85	35.1	46	57.9	194
Not Taken	35.1	46	46.6	95	42.1	141
Rheumatism/Arthritis**	100	113	100	209	100	322
Treatment Taken	77	87	59.3	124	65.5	211
Not Taken	23	26	40.7	85	34.5	111
Blood Pressure+	100	92	100	131	100	223
Treatment Taken	76.1	70	60.3	79	66.8	149
Not Taken	23.9	22	39.7	52	33.2	74
Diabetes*	100	57	100	73	100	130
Treatment Taken	86	49	69.9	51	76.9	100
Not Taken	14	8	30.1	22	23.1	30
Back Pain/Slipped Disc*	100	33	100	82	100	115
Treatment Taken	54.5	18	72	59	67	77
Not Taken	45.5	15	28	23	33	38
Lung Problem/Asthma*	100	36	100	64	100	100
Treatment Taken	77.8	28	56.3	36	64	64
Not Taken	22.2	8	43.8	28	36	36
Heart Problem	100	29	100	38	100	67

Cont'd...

Cont'd...

Treatment Taken	93.1	27	97.4	37	95.5	64
Not Taken	6.9	2	2.6	1	4.5	3
Ulcer/Gas Problem+	100	41	100	31	100	72
Treatment Taken	92.7	38	77.4	24	86.1	62
Not Taken	7.3	3	22.6	7	13.9	10
Dental Problems	100	11	100	29	100	40
Treatment Taken	54.5	6	51.7	15	52.5	21
Not Taken	45.5	5	48.3	14	47.5	19

Note: +, *, ** and *** = The Chi-square test results for each of the morbidity across their gender background are significant at 0.10, 0.05, 0.01 and 0.001 levels, respectively

Notable gender differentials in the percentage treatment taken for different morbidities are also seen. By and large, out of the 9 morbidities, for 7 morbidities men elderly have taken treatment to a higher extent than their women counterparts. Moreover, such percentage differentials have turned out to be significant in the case of rheumatism/arthritis ($p < 0.01$), poor vision/cataract, diabetes, lung problem/asthma ($p < 0.05$ in each of these cases) and blood pressure ($p < 0.10$). It is conspicuous to note that for the percentage of elderly who have taken treatment for chronic morbidities like back pain/slipped disc and heart problem is higher among women than among men, but the chi-square test results emerged significant ($p < 0.05$) only in the case of back pain/slipped disc.

Conclusions and Implications

From the foregoing analysis and discussion, the following major conclusions have been drawn. Among the Coimbatore urban elderly, poor vision/cataract, rheumatism/arthritis and blood pressure are the most prevalent chronic morbidities. Women appear to be suffering from most of the chronic morbidities than their counterparts, except in the case of ulcer/gas problems. Such patterns are noticed in or the other studies mentioned earlier. On the other hand, while the duration of years suffering from poor vision/cataract, rheumatism/arthritis, blood pressure, asthma and ulcer/gas problem is significantly higher among men than their women counterparts, the reverse pattern is noticed in the case of diabetes. These figures clearly establish that men are suffering from different chronic morbidities for longer periods than their women counterparts. Life styles habits followed by men like tobacco use, drinking alcohol, eating

unhygienic foods, etc. could be the major reasons for such finding, in addition to their exposure to polluted environment outside home. It also visible that in the case of majority of the chronic morbidities elderly men tend to availed/sought treatment from any health facility (mainly allopathic system) than women. Of course, to some extent it depends upon the intensity of chronic disease. For example, while women got treatment to a higher extent than men in the case of heart problems, the reverse pattern is noticed in the case of ulcer/gas problems and diabetes.

Based on the conclusions the following few policy implications are suggested. Firstly, Government should evolve strategies to provide geriatric services by special camps at district level hospitals or mobile vans may be organized at their door steps offering both preventive and curative services to the elderly persons. Non-communicable diseases emerged as the major ones among elderly, which deserves special attention of policy makers and programme managers. Early identification of chronic morbidities like diabetes, blood pressure, heart problems, asthma, etc. should be ensured through periodic screening and regular health checkups. Efforts also should be taken up providing training to health care providers to manage the commonly existing health problems among the elderly. Strategies may also be evolved to create awareness among the younger/other family members to understand the intensity of the morbidity status of the elderly persons and encourage them to help the elderly in availing proper medical/health care as and when there is need without any delay.

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A Study of the Factors Triggering Fear of Crime among the Elderly in Northern India

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ABSTRACT

The elderly are confronted with multiple problems in later life. The problems like crime against the elderly and fear of crime are the most concerning and emerging social issues in later life from ageing perspective. The study expounds the factors that trigger fear of crime among the elderly. The study also examines the nature of crime and its impact on way of life of the elderly. This study was carried out through ethnographic content analysis which include both focus group discussion and content analysis. The focus group discussion was conducted on 30 elderly in Lucknow in 2012 and for content analysis, cases of crime against the elderly were collected through two national news papers, Amar Ujala and Dainik Jagran from March 2012 to December 2012. The findings show that prior victimisation contribute significantly to the rise in fear of crime. The study has also found that psycho-social problems lead to both social and physical vulnerability causing disturbed social communication which plays its part in fear of crime.

Key words: Elderly, Ethnographic Content Analysis, Fear of Crime and India

The basis of our traditional social order is being undermined by the process of industrialisation, urbanisation and ongoing phenomenon of globalisation. They have cast their shadow on the norms and values of society. They have also weakened the emotional bonding of the individuals

from the family and society. The decline in joint family system, erosion of morality in economy and changes in the value system can be attributed to these processes of change. These processes have disorganised the society and disturbed everyone's life but the elderly are the worst affected group because the respect, honour, status and authority, which the elderly used to enjoy in traditional society, has gradually started declining and the elderly are relegated to an insignificant place in the society and family (Raju, 2011). Today, they are being attacked for grievous hurt, murder, robbery and elder abuse by the family members, neighbours and strangers. These are the leading problems faced by the elderly, which have certainly affected their way of life and sense of well-being. As a result, fear of crime is being recognised as a problematic phenomenon for the Indian elderly in recent times.

National Crime Record Bureau (2013) has reported that 40753 elderly have been murdered in all over India from 2001 to 2012. The crime against the elderly has also been documented by other reports such as Help Age India and Group for Economic and Social Studies. Help Age India (2013) conducted a study on elder abuse in twenty major cities of India. This study reported that 23 per cent elderly are abused nationally in India where 39 per cent cases of abuse are committed by daughters-in-law and in 38 per cent cases sons are involved in committing abusive behaviour. The most common form of abuse experienced by the elderly are disrespect (79%) followed by verbal abuse (76%) and neglect (69%), and a disturbing 39 per cent elderly faced beating in the family as well as in neighbourhood. This study has also identified the major reasons behind the elder abuse such as lack of adjustment, economic dependence of the abused, increasing longevity and economic dependence of abuser. Moreover, Group for Economic and Social Studies (2009) found in its report that crime against the body, property and emotional crime are faced by the elderly. Criminologists have rightly pointed out the problem in question is not only an issue of law and order but it is also embedded into the social realities and circumstances and hence it has some serious sociological implications. They feel that these murders are an extension of the isolation of old people in the society (Das, 2009).

Fear of crime among the elderly is a new field for the gerontological research in India. A few studies have been done related to fear of crime in India. These studies have presented only a general view of fear of crime. A study has been done related to fear of crime in Mumbai (Nalla *et al.*, 2011).

This study has found that rapid economic growth in India in last two decades has brought problems inherent to rapid urbanisation, uncontrolled population growth, migration from rural to urban areas, high level of poverty, inner city neighbourhood. Consequently, these problems are associated with the predicting of fear of crime because there is a rise in level of victimisation (those who have been victimised), and they have also unsecured the neighbourhood way of life due to increasing crime rate. Moreover, a study has been conducted on elderly through content analysis which found that weaknesses in physical environment, lack of proper social network, the presence of anti-social elements in the neighbourhood and poor vigilance by the law enforcement agency augments fear of crime (Mishra and Patel, 2013).

From the preceding lines it is apparent that fear of crime is prevailing among the elderly people in India and therefore, there is a dire need of scientific enquiry to analyse this issue from multiple perspectives and explore the factors affecting fear of crime among the elderly.

In India, persons aged 60 or above are considered elderly or senior citizens. The Maintenance and Welfare of parents and Senior Citizens Act, 2007 defines a senior citizen as a person who has attained the age of 60 years or above. Nevertheless, under the law relating to income tax in India, persons are regarded senior citizens only after they become 65 years old. The United Nations Organization also treats persons aged 60 years or more as elderly. Those who are between 60 and 74 years old are referred to as young-old and those who are aged 75 or above are referred to as old (Group for Economic & Social Studies, 2009). With 1.21 billion inhabitants counted in its 2011 census, India is the second most populous country in the world. With an ever changing socio-economic and demographic scenario across the country, living conditions of elderly have also changed remarkably. Today, with advancement of medical science, a better standard of life and overall development in the country, not only is the number of old people growing rapidly, their life expectancy is also gaining new heights every year. As per analysis of census 2011 data, population of older persons in India has already crossed the unique mark of 100 million. People over the age of 60 accounts for 8 per cent of India's national population. It is being considered that the population of elderly will be 315 million by 2050 (Arokiasamy *et al.*, 2011; Agewell Foundation, 2013; Help Age India, 2013). With the steady rise in elderly population, the rate of their problems is also

increasing. The fear of crime and perpetration of abuse and violence against the vulnerable elderly group are issues of serious concern.

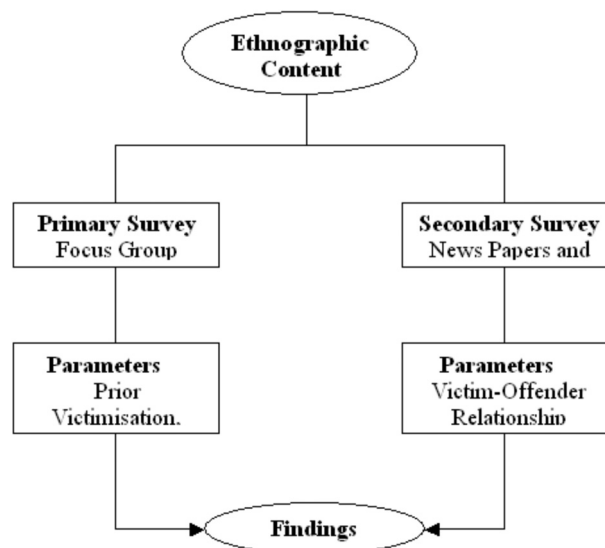
Conceptual Framework

Fear of Crime: Fear of crime is a very practical and prevalent issue in contemporary times. In this section, we explain the concept of fear of crime. Ferraro (1995) have given a classical definition of fear of crime. According to them “fear of crime is an emotional response of dread or anxiety to crime that a person associates with crime.” Ward *et al.* (1986) have defined fear of crime as “a lack of a sense of security and feeling of forthcoming harm to one’s well-being and vulnerability. Where harm and vulnerability can be real or imagined (Brugge, 2006).” The state of fear of crime is assumed to be multidimensional which consists of (a) the individual’s cognitive perception of being threatened, (b) a corresponding affective experience and (c) an appropriate motive or action tendency. Thus, being afraid implies that a situation is perceived as being dangerous and that a situation bears a motive for changes in behaviour. Hence there is a need to design fear of crime measures which assesses these three components, for example, by asking how often one (a) feels afraid, (b) thinks or worries about crime and (c) behaves fearfully (Gert, 2012).

Gerontological Approach: Gerontology is the study of the aging processes and individuals as they grow from middle age through later life. It is a multi-disciplinary field which includes social, psychological, and biological changes of the individuals as they age. Gerontology addresses many domains of social life and behaviour, including family relationships, health and disability, and the social participation of the elderly. Gerontology studies the impact of socioeconomic, political, and cultural forces and conditions of the elderly population, and the status and well-being of the elderly (Putney *et al.*, 2005). The availability and administration of psychological and nutritional counselling, proper housing and health care facilities for the elderly and crime or abuse against the elderly are major areas of gerontological research. Gerontological approach sees that crime against the elderly may be explained in three terms, namely, it is the form of abusive and neglectful behaviour. It is the violation of human, legal and medical rights. It is deprivation of choices, decisions, status, finance and respect (Shankardass, 2008).

Objective: There are two objectives of the study. The first objective explores the factors affecting fear of crime among the elderly. The second objective examines nature of crime against the elderly and victim-offender relationship. Finally, the study focuses on the provisions initiated by the State for the safety and the security of the elderly.

Figure 1
Ethnographic Content Analysis Method



Authors analysed the data through Ethnographic Content Analysis. Ethnographic Content Analysis (ECA) is the study of a particular group whose aim is to generate the descriptive categories and theoretical concepts directly from detailed descriptions from a group within a particular setting of interest. These detailed descriptions are obtained through primary sources and secondary sources. Ethnographic content analysis denotes an integrated method, procedure, and technique for locating, identifying, retrieving, and analysing documents for their relevance, significance, and meaning (Altheide, 1996). ECA involves emergent and theoretical sampling of documents from information based on field notes, development of a protocol for more systematic analysis, and then constant comparisons to clarify themes, frames, and discourse. A document is defined as any

symbolic representation and meaning that can be recorded. Document analysis expands as recording technologies improve and become more accessible, including print and electronic media, audio tapes and field notes and other forms of written materials (Altheide, 1987; Smith *et al.*, 1994; Gormly, 2004).

The study employed both primary and secondary data. The primary data was collected through focus group discussion. A sample of 30 elderly in the age range of 60 to 81 years was drawn by using purposive sampling from Lucknow district of Uttar Pradesh. The focus group discussion was conducted from 15th November to 30th November, 2012. This focus group discussion was made keeping all the necessary parameters in mind such as age group, gender, education, profession, income, living arrangements and factors of fear of crime among the elderly (prior victimisation, vulnerability and crime awareness). The sample included 60 per cent male elderly and 40 per cent female elderly (Table 2). Age distribution of the sampled elderly suggests that (Table 1) most of the elderly interviewed were in the 60–70 year age category. They constituted 46.6 per cent of the total sample. There were 30.0 per cent elderly respondents who belonged to the age group of 70–80 years and 23.4 per cent elderly were in the age group of 81 and above.

Moreover, authors used secondary data to collect information related to victim-offender relationship. The secondary data was obtained from news papers (*Danik Jagran* and *Amar Ujala*, Uttar Pradesh, Uttarakhand and Delhi Edition). The data was collected between the period of April 2012 to December 2012. The news items relating to victim-offender relationship (includes family members, relatives, neighbours and others persons, who victimise the elderly) were systematically collected and their content were analysed. There were five regions of North India such as Delhi, Kanpur Lucknow, Roorkee, and Unnao which were selected for the current study. The high incidences of crime reported from these areas were a reason to select these places for the current study. The authors collected 200 incidents of crime from the news papers, in which elderly were victimised by family members, relatives, neighbours and other persons.

Thus, ethnographic content analysis was employed in this study. The focus group discussion was used as a tool for ethnographic study. Authors divided 30 elderly respondents in three focus groups with ten respondents in each focus group. The respondents were asked about prior victimisation,

vulnerability and crime awareness through this focus group discussion. The elderly respondents who were more comfortable and interested in focus group discussion in each group were selected for case study. Further, study used content analysis to examine the victim-offender relationship.

Findings and Discussion

Prior Victimization: Dammert and Malone (2003) have found in their study that there is a positive correlation between fear of crime and prior victimisation. Victims of any violence and abuse have higher levels of fear of crime than those who are not victims of any violence and abuse. In this study researchers have found prior victimisation in three forms through group discussion of ten elderly, such as, crime against the body, crime against the property and emotional crime which have been committed against the elderly. Researchers have found that three elderly were physically tortured out of ten elderly. Regarding the issue of property related crime, five elderly told that their relatives and neighbours victimised them due to property. Out of these five elderly, three elderly were childless. This was the reason that their relatives and neighbours wanted to occupy their property. Further, researchers have found in group discussion that seven elderly were victimised emotionally by their sons and daughters-in-law. An elderly told that one day his daughter-in-law used bad language for him in the presence of his son. His son did not forbid her, she had been using continue bad language. This behaviour of his son and daughter-in-law emotionally shocked him. The researchers have found that the word emotional abuse is like behaviour of crime. Neglect and abandonment that was clearly felt by the group of elderly was defined as emotional crime. Disrespect and lack of dignified living were other acknowledged forms of emotional crime meted to the elderly. Researchers have observed during focus group discussion that those elderly who have been victimised earlier felt unsafe themselves. These elderly said during the interviews that they were worried about crime due to victimisation. It may be inferred that when individuals are victimised earlier, feeling of insecurity takes place in their minds and they always think that crime may be committed any time. Thus, we can say that prior victimisation plays an important role in the rising of fear of crime among the elderly.

Case Study 1: Mrs. Madhuri who is 69 year old narrated a case related to prior victimisation. She said that her niece-in-law who was staying with her

at the time of incident was also victimised in her home. She narrated that one day; some strangers stormed into her house and asked them to hand over the keys of cupboard. When both resisted, they were dragged to the bedroom where they were tied up and gagged. The criminals also brandished a country pistol and a dagger to threaten them. The criminals ran away after robbing jewellery and cash. When police came for enquiry, they told the police that one of the criminals looked like a carpenter who had fixed the door in her house. The police drew a warrant against him and within seven days the police arrested him with his three friends. The police recovered the entire cash and jewellery from them. After investigation it was found that carpenter would carefully track the movements of every member of house at work. He particularly targeted houses with single women and elderly. After this case she has become very alert and always carries a fear of victimisation.

Vulnerability: Vulnerability is the strong predictor of fear of crime among the elderly. Studies have found that there are four major vulnerable groups in the society such as elderly, women, children and ethnic minorities (Powell and Wahidin, 2007). Studies have also referred to two types of vulnerability such as physical and social vulnerability (On-fung, 2009). Researchers have focused on vulnerability to examine fear of crime among the elderly. Ten elderly people were selected for the group discussion in which physical and social vulnerability was discussed. Researchers have found during group discussion that elderly think that they are physically weak and are not able to protect themselves. Researchers have also observed that many of the elderly are suffering from multiple diseases such as paralysis, eye sight problem and diabetes. The elderly have become weak due to these diseases and these diseases have reduced their physical capability. Due to such physical vulnerability, they are not able to protect themselves from any mishappening or criminal assault. The possibility of fear of crime is higher among the elderly due to their physical weakness than other age groups.

Similarly, researchers have found that many elderly think that they are socially vulnerable because in old age they are less engaged in social activities and consequently, feel isolated. Many elderly in the study complained that people do not have time for the elderly and they do not have 'we feeling' like people of past. They are of the view that materialistic way of life has affected Indian social structure a lot and has contributed its share in

aggravating the psycho-social problems of the elderly. The nuclear families, working couples, changes in neighbourhood behaviour have left the elders neglected, uncared for and lonely. The social support of the elderly has weakened. Due to this many elderly are frail, vulnerable and cannot help themselves. These reasons lead to loneliness and isolation among elderly which makes them vulnerable socially and consequently, possibility of fear of crime increases.

Case Study 2: Shri Ram Prasad aged 71, unmarried, is eldest among the two brothers and two sisters. He stays in an old age home in Lucknow. During interview, his face was showing deep sadness. He told that his parents died very early in his life. All responsibilities of his brothers and sisters fell on his shoulders. He completed his intermediate with lots of financial difficulties and got a job in electric department. He spent all his earning in the education of his brothers and sisters. When the education of his brothers and sisters completed then they all settled down and got married. Now all are busy with their respective families and there is nobody to take care of him. This unsympathetic behaviour of family makes him very sad. He appeared very vulnerable and was suffering from acute sense of insecurity.

Case Study 3: Mrs. Vimla is 65 years widow woman, staying with her son for the last 10 years. Her husband was professor in a university. They lived a very happy and prosperous life with their two sons and two daughters. Vimla says that their sons were very obedient and sincere in their childhood. Their hard work and the blessings of their elders made them successful in their life. Her elder son, Ramesh, is an assistant director in U.P. Electricity Corporation and her daughter-in-law is a clerk in a Bank. He lives in Gorakhpur with his family. Her younger son, Susheel is also in a Government job

Vimla said that their life went on smoothly till her husband passed away. The family situation changed completely after that. She felt that her status was reduced and her daughter-in-law was displeased with her presence. She participate in household chores like cooking, escorting her grandchildren to school in the morning and to park in the evening, shopping. One day in the presence of her son, her daughter-in-law slapped her after a serious argument. After this her son locked her in a room and refused to serve meals to her. Now she has separated herself in other home which was made by her husband.

Crime awareness: The elderly respondents in the study showed strong awareness of crime against the elderly. They mentioned that there are many reasons behind the rise in crimes. One respondent felt that the declining of traditional social structure is responsible for the increasing cases of crime. Moreover, another respondent argued that nowadays nobody follows social norms and values and people are deviating from their morality and honesty. Due to this our social bonds are weakening fast. Consequently, our society is in a disorganised state which further encourages anti social elements. Their views on decline in traditional social norms and consequent rise in crime in general and against the elderly in particular are derived from their exposure to different communication media such as newspaper, television, radio and discussion with people. The continuous access of the elderly to the print and electronic media has made them aware of the different kinds of crimes committed against the elderly. The authors found that such exposure to crimes have contributed to their fear of crime significantly. They showed anxiety and feeling of insecurity.

Victim-offender Relationship: We can discuss the victim-offender relationship as a consequence of changes in structure and function of the family. Elderly are not being given adequate attention and care by the family members due to these changes. These changes have led to indignity, disgracefulness, embarrassment, dishonour, disheartening, disregard, injustice, lack of care and psychological torture towards elderly (Khan 2004, 174). The apathy of family members towards their elderly is a common scenario in the entire globe. The studies have already indicated this trend where the family members, relatives and neighbours pose serious threat to physical and mental and financial well-being of the elderly (Patel, 2010, Rufus D. and Shekhar, 2011).

A study by Rufus D. and Shekhar (2011) in Tirunelveli district of Tamil Nadu revealed that many of the respondents have been abused financially, emotionally and physically by their own family members. Similarly, Sebastian and Sekhar (2011) have found in their study in Kerala that elderly poor are vulnerable to different forms of abuse along with rich elderly in Indian families. Elderly women especially widows are more affected by mistreatment. Sons, daughters, sons-in-law, servants and others mistreat the elderly physically, verbally and financially. Moreover, Bagga and Sakurkar (2011) have studied the elderly women in Pune and found that most elderly women are ill-treated by their close relatives such as daughter-

in-law (43.5%), son (21.7%), husband (8.6%) and neighbour (4.3%). It has also been found in a content analysis study related to crime against the elderly that 44.71 per cent crime against the elderly is in the form of murder (Mishra and Patel, 2013). The study further illustrated that in 42.35 per cent cases family members and neighbours are involved in committing crime against the elderly.

Apart from the focus group discussion of 30 elderly in Lucknow, the current study is also based on the content analysis of 200 cases of crimes against elderly reported in newspapers regarding victim-offender relationship. We found that family members and relatives are involved in 25.0 per cent (50 cases) of crime against the elderly. The neighbours of the elderly persons have been found to be involved in 22.0 per cent (44 incidents) of crime. If we add up the data on crime perpetrated by family members and neighbours, the number obtained is 94 (47.0%) out of 200 respondents. This is a substantial percentage which reveals that the elderly are not safe in their own homes or from their neighbours. The authors also found that 40.5 per cent (81 cases) of crime have been committed by unknown persons. These studies reveal that elderly are not safer in their own families and in neighbourhoods because crime against the elderly are committed in the family as well as in their neighbourhood which brings fear of crime among the elderly in recent times.

Conclusion and Suggestions

The paper asserts that fear of crime is an emerging social problem among the Indian elderly. The researchers have conducted both an empirical study as well as did a content analysis of crime reports through many studies for explaining the fear of crime among the elderly. The paper has focussed on social determinants (prior victimisation, vulnerability, crime awareness and victim-offender relationship) of fear of crime and how they play a role in raising of fear of crime among the elderly. It was found that most of the crimes against the elderly has been committed for grabbing property. The elderly feel that they are too physically vulnerable to protect themselves. They also feel socially isolated due to their reduced social activities in advancing years. The continuous exposure to print and electronic media and the reporting of crime in them make the elderly fearful of crime. Moreover, the study has also focussed on victim-offender relationship through newspapers. Out of 200 cases of crime reported against the elderly

in two leading Hindi newspapers during April 2012 to December 2012, almost half of the cases reported in the newspapers reveal that the elderly have been victimised by the known persons. These known persons are either family members such as son, daughter-in-law, nephew, relatives and neighbours. The family members and immediate neighbours exhibit disgracefulness, dishonour, injustice, lack of care, psychological torture and negative behaviour and attitudes towards the elderly in contemporary times. Such attitude of the family and wider society can be seen as causes of crime against the elderly and consequently, rise of fear of crime among the elderly.

The study suggests that more targeted information and delivery strategies at both neighbourhood and individual level (elderly context) may be required to control fear of crime among the elderly. Therefore, it is the need of the hour to establish Elderly Policy Council by Government in each state of country to conduct policy analysis, promote intergenerational solidarity and influence public opinion. It should be an autonomous body and it should have no link with Government except for financial aid. Civil society should be authorised for its supervision because civil society can play a more crucial and effective role than Government. It should have a uniform purpose such as helping family in responsible parenthood, serving as a voice for the elderly, promoting elderly helpline and elder-friendly community. It should also play a role to control crime against the elderly in collaboration with police. Elderly Policy Council should run program such as neighbourhood watch programme and group activities with the elderly. Engaging the elderly in these programmes might promote we-feeling among the elderly which can reduce their fear of crime.

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Appendix

Demographic Status of Elderly

		<i>Frequency</i>	<i>Percent</i>
Table 1 - Age	60–70	14	46.6
	71–80	9	30.0
	Above 81	7	23.4
	Total	30	100.0
Table 2- Gender	Male	18	60.0
	Female	12	40.0
	Total	30	100.0
Table 3- Education	Primary (1–5)	6	20.0
	Intermediate (6–12)	7	23.3
	Graduation	8	26.7
	Post Graduation	3	10.0
	Illiterate	6	20.0
	Total	30	100.0
Table 4- Occupation	Teacher	6	20.0
	Officer/Medical	3	10.0
	Agriculture	9	30.0
	Clerk	5	16.7
	Business	7	23.3
	Total	30	100.0
Table 5- Income	1000–5000	8	26.7
	6000–10000	6	20.0
	11000–15000	7	23.3
	16000–20000	5	16.7
	Above 21000	4	13.3
	Total	30	100.0
Table 6- Staying with Whom	With Children	10	33.3
	With Spouse	13	43.3
	Alone	7	23.4
	Total	30	100.0
Table 7- Factors of Fear of Crime	Prior Victimization	10	33.3
	Vulnerability	10	33.3
	Crime Awareness	10	33.3
	Total	30	100.0

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Brazilian Institutionalized Elderly: Profile, Self-reported Health and Vaccination

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ABSTRACT

This descriptive cross-sectional study presents an analysis of the health profile, influenza immunization, and self-rated health in elderly residents in Long-Term Care Facilities (LTCF) in a city in the interior of São Paulo, Brazil. A total of 77 institutionalized elderly were interviewed dependence level I and II assessed using the Katz Scale. Data were analyzed descriptively. Results indicate that the majority of elderly hypertension, diabetes mellitus and post-stroke sequel and use of diaper, but without physical disabilities, with intake of more than four medications per day, institutional medical care and no previous report of fall. There was growing adherence of immunization to influenza vaccination in five years. It was Concluded to ensure a comprehensive and humane care is necessary to know the profile of the assisted population, which enables the development of strategies.

Key words: Nursing; Vaccination; Institutionalization; Health Services for the Aged; Geriatrics.

The society has been marked by ageing with a significant increase in the number of elderly, it is estimated that by the year 2050 the population will increase by about 2 million people living in developed countries. In Brazil there are around 17.6 million elderly and it is estimated that over the next 20 years this number will double.¹

Old age brings its own characteristics that may modify everyday activities, these being the social, cultural and health environment, allowing the

coexistence and exchange of knowledge between individuals of the same age being important in this context. (Pickard 2014)

Long-Term Care Facilities (LTCF) for the elderly are specialized in serving this age group, elderly who have no family choose to live in institutions, because they not want to bother your family, friends, children, and thus prefer to be independent and reside in institutions. Thus, the look at the institutionalized elderly is changing, over time the institution of long permanence do not is seen as “deposit elderly”, but understood and respected as an option in the context of life of each individual. (Leite and Marques 2011)

The ageing process can bring dependency, so nurses and multidisciplinary team have a crucial role to help the elderly, is a period in which the underlying disease are more pronounced. Therefore it is important that health professionals and family members are aware of the changes and can contribute to the treatment and prevention of diseases. (Moreira MDM 2014)

This study aimed to investigate the health profile of the institutionalized elderly, vaccination and health perceived by them. Influenza is a disease that affects a large rate of elderly people, as well, the federal government established a flu shot, being a right and obligation of elderly households and institutions that harbor them.

Materials and Methods

This is a quantitative and cross-sectional study with a descriptive design. The study was conducted in na LTCF for elderly individuals in a city in the interior of Sao Paulo, Brazil. The participants were individuals 60 years old or older and living in an LTCF. Inclusion criteria were: being 60 years old or older, living in an LTCF, having no severe impairment of language or comprehension, degree of dependence I and II and signing a free and informed consent form.

The degree of dependence was obtained by means of the Katz scale that assesses Independence in Activities of Daily Living and Instrumental Activities of Daily Living (IADL). The study was approved under protocol number 153/12 in accordance with the requirements of Resolution 196/96 preconized for research with humans. (Smanioto and Haddad 2011)

Participants

Were analyzed 77 subjects who did meet the inclusion, Table 1 presents the participants characteristics, Most (50%) of the 77 institutionalized individuals were women, aged 71 to 80 years (47,50%), single (67,50%), without children (60%) with incomplete primary education (57,50), who receive a pension as a source of income (100%), who had previous occupation as being caretakers of the house (52,50).

Table 1
Profile of Institutionalized Elderly Individuals (N=77), Taubaté, 2012

Characteristics	Female		Male	
	N	%	N	%
Gender	40	51,95	37	48,05
Age (years)				
45 I-59	—	—	3	8,11
60 I- 70	7	17,50	11	29,73
71 I- 80	19	47,50	18	48,65
More or equal to 81	14	35,00	5	13,51
Marital status				
Married	0	0	3	8,11
Widowed	13	32,50	5	13,51
Single	27	67,50	24	64,86
Separated or divorced	0	0	5	13,51
Have a Children	16	40,00	15	40,54
Education				
Illiterate	14	35,00	7	18,92
Incomplete primary school	23	57,50	22	59,46
Complete primary school	3	7,50	4	10,81
Incomplete secondary school	0	0	1	2,70
Complete secondary school	0	0	3	8,11
Complete college	0	0	0	0
Source of income				
Retirement	40	100	37	100
Other (allowance/assistance)	—	—	—	—
Previous occupation to Institutionalization				
Caretakers of the house	21	52,50	—	—
Worked	13	32,50	27	72,97
Do not Know	6	15,00	10	27,03

Data Collection Procedures

Data were collected August 2012 through individual interviews with elderly individuals on the LTCF premises, Interviews were held only after the participants approved and signed the “Statement of free and informed consent”, An instrument addressing each individuals’ name, gender, date of birth, have a children, date when admitted into the institution, source of income marital status, educational level, and previous occupation to Institutionalization, was used to characterize the elderly individuals, The “Mini Mental State Examination” (MMSE) was used to screen for cognitive impairment, Its score varies according to the educational level of individuals and, depending on the score, may indicate the presence of cognitive impairment, to assess the degree of dependence was used the Katz scale, which assesses Independence in Activities of Daily Living and Instrumental Activities of Daily Living (IADL), Were characterized by Grade I, independent seniors who are able to perform their activities of daily living without assistance from another person, even with the use of equipment; Grade II, dependent elderly, are able to perform daily activities such as performing self-care such as eating, walking alone, making hygiene and without any change or cognitive impairment; Grade III, the elderly who are dependent and need care in all activities of daily living and who have cognitive deficits or not.

Data Analysis Procedure

Data were analyzed using analyzing the charts of institutionalized elderly and quantified in absolute numbers and percentages, analyzed quantitatively and descriptively.

Results

Regarding the length of institutionalization most have less than three years, his going to the institution gave up due to living alone or not having someone to care, according to information in Table 2, information regarding the clinical data are shown in Table 3, which shows as co-morbidates the hypertension, diabetes and neurological disorders, diaper use, without physical alteration, daily use more than four different types of medication, with medical monitoring and judge his health as good.

Table 2
Information about the Institutionalization (N = 77). Taubaté, 2012

<i>Data</i>	<i>Female</i>		<i>Male</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Time in Institution (years)				
< 3	22	55,00	16	43,24
3 I-6	7	17,50	5	13,51
6 I-9	1	2,50	5	13,51
More than 9	10	25,00	11	29,73
Reason for admission given by the Institution				
Lived Alone	10	25,00	10	27,03
He had no one to provide care	14	35,00	16	43,24
Health problems	9	22,50	7	18,92
House without condition	0	0	4	10,81
Transfer – another institution	7	17,50	0	0

Table 3
Distribution of Clinical Data of the Institutionalized Elderly (N = 77). Taubaté, 2012

<i>Clinical Data</i>	<i>Female</i>		<i>Male</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Co-morbidities				
Hypertension	9	22.50	10	27.03
Stroke sequelae	8	20.00	5	13.51
Neurological changes	7	17.50	7	18.92
Diabetes Mellitus	5	12.50	3	8.11
Renal insufficiency	4	10.00	4	10.81
Senility	4	10.00	6	16.22
Cancer	2	5.00	2	5.41
No apparent disease	1	2.50	–	0
Use Of Diaper	25	62.50	17	45.95
Physical changes				
No change	24	60.00	26	70.27
Paresthesia	6	15.00	4	10.81
Visual impairment/speech/walk	6	15.00	4	10.81

Cont'd...

Cont'd...

Amputation	4	10.00	3	8.11
Daily medicines (quantity)				
> 4	34	85.00	27	72.97
3/4	6	15.00	10	27.03
Medical monitoring				
Clinical	30	75.00	25	67.57
Other Specialties	10	25.00	12	32.43
Falls				
Not fell	29	72.50	29	78.38
There are fewer 10 year	11	27.50	8	21.62
Self-perception of health status				
Excelent	0	0	1	2.70
Good	28	70.00	28	75.68
Bad	10	25.00	2	5.41
Rubbish	2	5	2	5.41
Do not Know	0	0	4	10.81

There was a progressive increase in the vaccination against influenza both among women as among men as shown in Table 4.

Table 4

Distribution of Influenza Immunization of Institutionalized Elderly. Taubaté, 2012

Gender	2008		2009		2010		2011		2012	
	N	%	N	%	N	%	N	%	N	%
Female	30	75.00	28	70.00	28	70.00	35	87.50	40	100
Male	25	67.57	25	67.57	28	75.68	29	78.38	34	91.89

Discussion

Being in a Long-Term Care Facility (CTCF) for some people no is longer the punishment and even negligence. Today many seniors believe that to be in an institution results in better care, adequate infrastructure and daily activities targeted to your needs. (Davim *et al.*, 2004 and Silva *et al.*, 2013)

It is important to remember that despite the divergence of studies and concepts when the LTCF, after a certain period the feeling before negative

becomes positive, because of security and satisfaction with social life got in the institution. (Malheiro 2012)

The increased life expectancy among women is evident in developing countries like Brazil, due low fertility rates and high male mortality rates, and the women show more attention to health, know more signs and symptoms of diseases and seek more health professionals when compared to men. (Ferreire 2011)

Along with the aforementioned characteristics, this and other studies show that single elderly women with low education which possibly had no children and whose family is less numerous, is more likely to age in LTCF, because there is lack of potential caregivers.

It is noteworthy in educational terms that illiteracy is a reality in developing countries like Brazil. In this study the elderly lived in a time where education was not a priority, which serves as a warning to professional caregivers in terms of proper communication to the level of education and understanding that the elderly care may have.

The population ageing, sedentary lifestyle, inadequate dietary habits, and other social changes and behavior, increase the incidence and prevalence of diabetes and hypertension, and the mortality for disease. The bad habits culminate in stroke debilitating and limit neurologically. (Nogueira *et al.*, 2012)

Thus, because of the senescence the older more becomes dependent on daily medications which require a closer look at for is not be exchanged or given in inappropriate times. The large drug intake in the elderly becomes well assisted in LTCF which have professionals for this type of assistance. However, one must consider that independence and self-care should be encouraged in the institutions so that they do not serve as allies of the decrease of autonomy of activities of daily living of the elderly. (Ministerio da Saude 2015)

As in this study, the institutionalized elderly has shown a good health perception. It proves able to realize self and evaluate your health which demonstrates lucidity and insight, which can often be overlooked and ignored by professional caregivers. Therefore, one should take into account the self-assessment referred to by the elderly and use it as a tool in health interventions.

The individual who presents changes resulting from aging process has a decline in immune activity, making the elderly vulnerable to disease, and the main circulatory and respiratory system, cancers and certain infectious and parasitic diseases. (Soares, M.M. *et al.*, 2012)

The influenza virus is one of the causes of respiratory infections in the elderly, where 75 per cent of infections are caused by it, vaccination is an effective prevention method, which gets good results in this regard. Because it influences the reduction of mortality from influenza, hospitalization, use of drugs and prophylaxis secondary diseases. (Alencar *et al.*, 2012; Ministerio 2011 and Donalisio *et al.*, 2006)

Vaccination in hospital and in the LTCF for elderly were able to reach a large number of elderly people over the years, so reducing the risk of developing severe respiratory diseases that can lead to death. (Francisco PMBS *et al.*, 2006; Reed C *et al.*, 2014; Thomas, RE, and Lornzetti DL 2014 and Riedmann, EM 2014)

Conclusions

Studies like this allow to perceive the institutionalized elderly as a possibility within the assistance that must be looked with cautiously. It is worth noting that if the elder has not a good family socializing, this will inevitably contribute to the absence of this interaction in old age.

Even LTCF being places able to assist the elderly with quality, the family environment whenever possible should be encouraged and cozier option at this stage of life.

Conflict of Interest Statement

There are no financial conflicts of interest or of any other nature, on the part of the authors “Brazilian institutionalized elderly: Profile, self-reported health and vaccination”.

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Competency of a Graduate after Doing MBBS in Practicing Geriatrics Medicine

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ABSTRACT

There is an increase in geriatric population and the elderly people suffer from dual medical problems, i.e., both communicable as well as non-communicable diseases. There is deficiency felt in undergraduate geriatric training in spite of the longitudinal coverage of most of the content areas and a need for well trained interdisciplinary care of older persons. Geriatrics in India is in a nascent stage and is not encouraged as a practice. The present study was undertaken to see the Competency of a Graduate after Doing MBBS in Practising Geriatrics Medicine. 50 participants, (ten faculty members, 18 residents and 22 interns) were asked to fill in a questionnaire to assess the basic knowledge and level of competency regarding geriatric population and perception regarding geriatrics medicines. Majority of participants felt the need for specialist training programmes for geriatric medicine and special short module for day to day practice. The majority of participants were either quiet competent to a little bit competent in dealing with geriatric medicines or the interns found them quite incompetent in dealing with geriatric patients. Most of the participants felt the need of specialist training programmes for geriatric medicine and special short module for day to day practice.

Key words: Geriatric medicine, faculty, interns, population.

“Geriatrics is a branch of General medicine that is concerned with the clinical, preventative, remedial and social aspects of illness in old age” as defined by The Royal College of Physicians (London).

The sudden increase in geriatric population is as a result of declining fertility rates and increasing life expectancy, the population of India has undergone has a major demographic change, the overall age dependency ratio now stands at 0.584 (Mahajan and Ray, 2013)

In India, the elderly people suffer from dual medical problems, i.e., both communicable as well as non-communicable diseases, further compounded by impairment of special sensory functions like vision and hearing, as well as decline in immunity leading to an increased burden of diseases in elderly. The prevalence of tuberculosis is higher among the elderly than younger individuals (Arora and Bedi, 1987). A WHO sponsored study has revealed that there was a high prevalence of diseases like diabetes mellitus, hypertension and other old-age ailments among the senior citizens and there is an urgent need for having a separate Geriatric Department (Shah, 2005).

A worldwide survey conducted by WHO showed that only 41 per cent of the curricula mention geriatrics in some way and only 24 per cent had an independent unit for geriatric medicine (Keller *et al.*, 2002). The WHO advocates the need for well trained interdisciplinary care of older persons, and universities have incorporated geriatric training programmes into medical curriculum (Huber, 1999; Roberts *et al.*, 2006). The American Geriatrics Society’s Education Committee has recommended the core competencies for the care of older persons (2000), British Medical Council also emphasised the need to be equipped for the special needs of older people (GMC, 2003). But there is deficiency felt in undergraduate geriatric training in spite of the longitudinal coverage of most of the content areas (Shah, 2005).

Gerontology in India is in a nascent stage and includes a set of conditions specifically associated with old age. The incidence of such conditions, such as falls, cognitive impairment, vision impairment, hearing impairment, delirium, dizziness and frailty, is increasing. Geriatric medicine is not encouraged as a practice. Internists, without being specially qualified to assess and treat geriatric conditions attend to such patients. Therefore, the

average geriatric medical condition goes under/untreated and the total burden in the population of such conditions is always underestimated. With increasing life spans, elders in India are commonly facing conditions which were considered rare two generations back (Mahajan and Ray, 2013).

The present study was undertaken to see the Competency of a Graduate after Doing MBBS in Practicing Geriatrics Medicine.

Methodology

This prospective study was conducted in Department of Pharmacology, GSMCH, Patiala from November 2014 to January 2015 after approval from Institutional Ethics Committee (IEC). After written informed consent, the interns, residents and faculty members were enrolled in the study. All steps were taken to maintain the confidentiality of the participants. All the participants had to fill in a questionnaire to assess the basic knowledge and level of competency regarding geriatric population and perception regarding geriatrics medicines. The questionnaire was given to the participants and he was given time to fill it up, the same was collected from the participants after ensuring that he had filled it up.

Questionnaire (Annexure 1)

The questionnaire consisted of two parts: the first section consisted of four questions that had to be answered in either yes or no. The questions in this section were dealing with the aspect of training/special courses in geriatric medicine.

The second section consisted of 28 questions that were designed to know the perception of doctors about Geriatrics teaching, training and competency of a graduate after doing M.B.B.S. The response to each question varied from “not at all” to “completely competent”; and was graded from a to d. The response was as follows: a: not at all; b: a little bit; c: quite a lot; and d: completely competent.

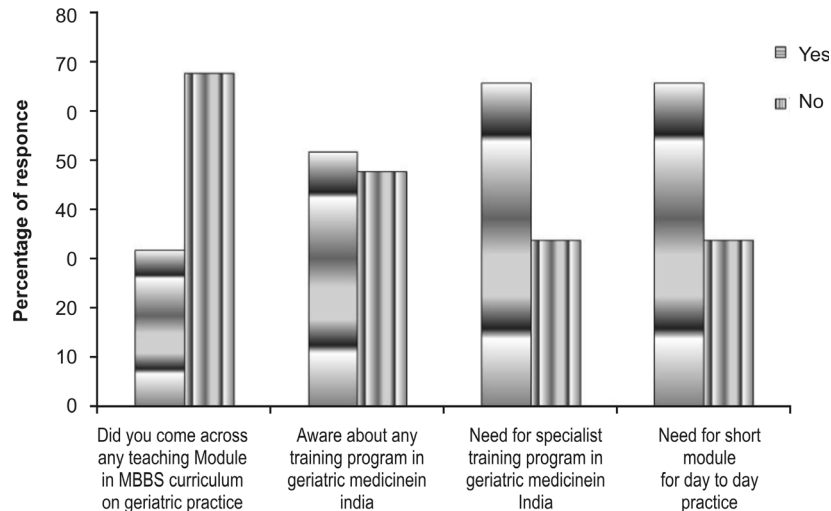
Statistical Analysis

The data assembled was presented as mean $\pm$ SD. Results were analyzed with the help of appropriate parametric and non-parametric tests like students t-test, chi-square test, ANOVA, Mann Whitney test. The results with p value of <0.05 was considered as statistically significant.

Results

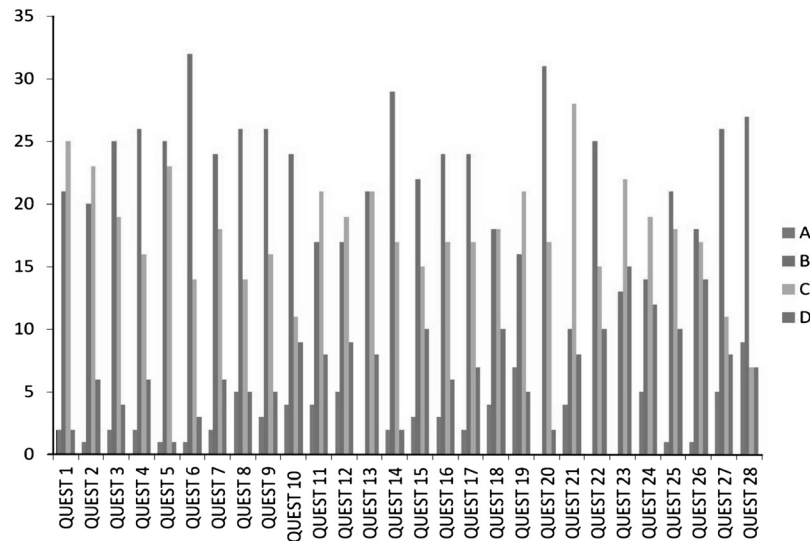
A total of 150 interns, residents and faculty members were given the questionnaire out of which only 50 participants completed the questionnaire and gave written informed consent to participate in the study. Ten faculty members, 18 resident and 22 interns completed the questionnaire and were included in the result analysis. As shown in Figure 1, 68 per cent of participants responded that they did not come across any teaching module in their MBBS curriculum on Geriatrics, although 52 per cent responded that they were aware of special courses or training programs in India. Majority (66%) participants felt the need for specialist training programs for geriatric medicine and special short module for day to day practice. There was no significant ($p>0.05$) difference in the response based on designation.

Figure 1
Response of Participants in Section I



The Knowledge aspects of participants are presented in Figure 2, and Table 1; this component had 28 questions and each question had four options varying from “not at all” to “completely component”. The responses of the participants have been shown majority believed they were

Figure 2
Responses of Participants to Section II



quiet competent to explain the impact of age related changes on drug selection and could identify the medication that has to be avoided, although the intern thought they were only little competent with both the aspects. Majority of the respondents felt they were little competent with identifying the complete medication list, compare clinical presentation, formulate differential diagnosis, urgently initiate diagnostic work up, perform and interpret cognitive assessment, develop a management plan, assess functional abilities, and develop a preliminary management plan, with residents and faculty member having significantly higher competent skills as compared to interns.

Table 1
Response of Participants in Section II

Question (Response)	Faculty (n=10)	Residents (n=18)	Interns (n=22)	P Value
1 (A:B:C:D)	0:3:5:2	0:6:12:0	2:12:8:0	<0.05*
2 (A:B:C:D)	0:0:5:5	0:6:11:1	1:14:7:0	<0.05*

Cont'd...

Cont'd...

3 (A:B:C:D)	0:3:6:1	0:10:6:2	2:12:7:1	>0.05
4 (A:B:C:D)	0:2:3:5	0:11:6:1	2:13:7:0	<0.05*
5 (A:B:C:D)	0:1:9:0	1:10:6:1	0:14:8:0	<0.05*
6 (A:B:C:D)	0:5:2:3	0:11:7:0	1:16:5:0	<0.05*
7 (A:B:C:D)	0:2:5:3	0:11:5:2	2:11:8:1	>0.05
8 (A:B:C:D)	0:5:3:2	2:9:5:2	3:12:6:1	>0.05
9 (A:B:C:D)	0:2:6:2	3:7:7:1	0:18:3:1	<0.05*
10 (A:B:C:D)	0:2:2:6	2:10:4:2	3:14:4:1	<0.05*
11 (A:B:C:D)	0:1:5:4	1:6:7:4	3:10:9:0	>0.05
12 (A:B:C:D)	0:0:6:4	0:5:9:4	5:12:4:1	<0.05*
13 (A:B:C:D)	0:2:2:6	0:6:10:2	0:13:9:0	<0.05*
14 (A:B:C:D)	0:4:6:0	0:12:5:1	2:13:6:1	>0.05
15 (A:B:C:D)	0:2:3:5	1:9:6:2	2:11:7:2	>0.05
16 (A:B:C:D)	0:1:5:4	0:9:7:2	3:14:4:1	<0.05*
17 (A:B:C:D)	0:2:6:2	1:8:7:2	1:14:5:2	>0.05
18 (A:B:C:D)	0:1:3:6	1:7:6:4	3:10:8:1	<0.05*
19 (A:B:C:D)	0:1:7:2	2:7:8:1	5:9:8:0	>0.05
20 (A:B:C:D)	0:1:7:2	0:10:7:1	0:20:2:0	<0.05*
21 (A:B:C:D)	0:0:4:6	1:4:11:2	3:6:13:1	<0.05*
22 (A:B:C:D)	0:2:3:5	0:8:6:4	1:15:5:1	>0.05
23 (A:B:C:D)	0:1:4:5	0:3:8:7	0:9:11:2	>0.05
24 (A:B:C:D)	0:0:4:6	1:8:6:3	4:6:10:2	<0.05*
25 (A:B:C:D)	0:1:3:6	0:7:7:4	1:13:6:2	<0.05*
26 (A:B:C:D)	0:1:2:7	0:7:6:5	1:10:10:1	<0.05*
27 (A:B:C:D)	0:2:3:5	1:9:6:2	4:15:3:0	<0.05*
28 (A:B:C:D)	1:3:3:3	2:11:3:2	6:13:1:2	>0.05

* p<0.05, significant difference in response based on designation using Chi-Square Test

The responses of the participants have been shown majority believed they were quiet competent to assess the safety risk in home environment, about relevant history, construct a differential diagnosis, generate diagnosis based on presentation and provide initial pain management although the

intern thought they were only little competent with both the aspects. Majority of the respondents felt they were little competent with identifying the code status, accurately identify clinical situation, identify psychological changes and with residents and faculty member having significantly higher competent skills as compared to interns.

The responses of the participants have been shown majority believed they were quiet competent to present palliative and explain risk, indication and alternatives, although the intern thought they were only little competent with both the aspects. Majority of the respondents felt they were little competent with identifying potential hazards of hospitalization, communicate the key components, conduct a surveillance exam, suspect abuse, and were familiar with laws, with residents and faculty member having significantly higher competent skills as compared to interns.

Discussion

It is estimated that adults over the age of 65 will comprise of 20 per cent US population by 2030 (Dacey *et al.*, 2007), and 23 per cent of the population will be aged 65 years and over by 2035 in UK (Fisher *et al.*, 2014). The growing demand of number of physicians trained and certified as geriatricians is not likely to be met, and physician assistants (PAs), along with primary care physicians and nurse practitioners, will be increasingly expected to care for elderly patients (Dacey *et al.*, 2007) and a negative attitude towards elderly persons may lead to lower quality care to their elderly patients. Educational interventions designed to change attitudes and increase knowledge about older adults have provided evidence that such interventions may improve medical students' attitudes. Educational interventions can be designed to impart skills, improve attitudes and increase knowledge, and is possible that skills-oriented educational interventions may be more effective at improving student attitudes toward the elderly (Goeldlin *et al.*, 2014).

The results of our study showed that most of the participants felt the need of specialist training programs for geriatric medicine and special short module for day to day practice. The majority of participants were either quiet competent to a little bit competent in dealing with geriatric medicines.

The intern who had just completed their MBBS exam found them quite incompetent in dealing with geriatric patients.

The results of our study are similar to a study that hypothesized that knowledge of ageing, attitudes toward the elderly, and interest in geriatric medicine was relatively low among Physician Assistant students and the data supported the increase of geriatric education and inclusion of exposure to well elderly in order to stimulate interest and optimally prepare students for professional careers in geriatric medicine (Dacey *et al.*, 2007).

Another study done to assess the Effects of geriatric clinical skills training on the attitudes of medical students concluded that Teaching that targets specific skills improved the attitudes of medical students towards elderly patients, though the improvement was slight and the addition of attitude-building elements may improve the effectiveness of future skills-oriented educational interventions. The results of this study are similar to our study where we found a low level of competency among physician towards geriatric medicine, although we did not go for clinical skill training (Goeldlin *et al.*, 2014).

One more study done to seek input from medical students and internal medicine residents (“trainees”) on their perception of their needs for training in Geriatrics demonstrated that trainees identified gaps in skills and knowledge leading to frustration and potentially adverse outcomes in caring for elderly patients. They also felt the need for development of curriculum guidelines should include assessment of trainees’ perceived learning. The results of this study are quite similar to our study where the participants felt incompetent in taking care of geriatric medicine (Drickamer *et al.*, 2006).

There are certain limitations to our study: Firstly, the sample size was small and the limiting factor for this was the short duration of study. Secondly, a post questionnaire training would have given an more appropriate suggestion, but due to limited availability of specialist in Geriatric medicine this could not be feasible.

To conclude most of the participants felt the need of specialist training programmes for geriatric medicine and special short module for day to day practice. The majority of participants were either quiet

competent to a little bit competent in dealing with geriatric medicines or the interns found them quite incompetent in dealing with geriatric patients.

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Annexure 1

Name_____	Age/Sex_____
Department/Designation_____	
Qualification_____	Year of Passing MBBS_____

Section A

1. Did you come across any teaching module in your MBBS curriculum in relation to Geriatrics/Geriatics Medicine/Geriatric Pharmacology/Geriatics Physiology/etc.? **(Yes)/(No)**
2. Are you aware of any special courses/Training Program in Geriatrics running in any medical institute/hospital in India? **(Yes)/(No)**
3. Do you feel the need for specialist training program for Geriatrics medicine in medical institutes/hospitals in India? **(Yes)/(No)**
4. Do you feel need of special short module for Geriatric training for medical graduates to help general physicians in day to day practices? **(Yes)/(No)**

Section B

Following questionnaire is designed to know the perception of doctors about Geriatrics teaching, training and competency of a graduate after doing M.B.B.S

Rate the following statements accordingly:

A: Not at all; B: A little bit; C: Quite a lot; D: Completely competent
For Question 1–27 can a MBBS graduate?

<i>S. No</i>	<i>Question</i>	<i>Rating (A, B, C, D)</i>
1.	Explain impact of age-related changes on drug selection and dose based on knowledge of age-related changes in renal and hepatic function, body composition, and Central Nervous System sensitivity.	
2.	Identify medications including anticholinergic, psychoactive, anticoagulant, analgesic, hypoglycemic, and cardiovascular drugs that should be avoided or used with caution in older adults and explain the potential problems associated with each.	

3. Document a patient's complete medication list, including prescribed, herbal and over-the-counter medications, and for each medication provide the dose, frequency, indication, benefit, side effects, and an assessment of adherence.
4. Compare and contrast among the clinical presentations of delirium, dementia, and depression.
5. Formulate a differential diagnosis and implement initial evaluation in a patient who exhibits delirium, dementia, or depression.
6. Urgently initiate a diagnostic work-up to determine the root cause (etiology) in an older patient with delirium.
7. Perform and interpret a cognitive assessment in older patients for whom there are concerns regarding memory or function.
8. Develop an evaluation and non-pharmacologic management plan for agitated demented or delirious patients.
9. Assess and describe baseline and current functional abilities in an older patient by collecting historical data from multiple sources, making sure to include instrumental activities of daily living and activities of daily living, and performing a confirmatory hearing and vision examination.
10. Develop a preliminary management plan for patients presenting with functional deficits, including adaptive interventions and involvement of interdisciplinary team member's from appropriate disciplines, such as social work, nursing, rehabilitation, nutrition, and pharmacy.
11. Identify and assess safety risks in the home environment, and make recommendations to mitigate these.
12. Ask all patients > 65 years of age, or their caregivers, about falls in the last year, watch the patient rise from a chair and walk (or transfer), then record and interpret the findings.
13. Construct a differential diagnosis and evaluation plan that addresses the multiple etiologies identified by history, physical examination and functional assessment in a patient who has fallen.
14. Define and differentiate among types of code status, health care proxies, and provision where a patient can state instructions for his treatment choice in case he is not in a state to make a decision (advance directives) in the state where one is training.
15. Accurately identify clinical situations where life expectancy, functional status, patient preference or goals of care should override standard recommendations for screening tests in older adults.
16. Accurately identify clinical situations where life expectancy, functional status, patient preference or goals of care should override standard recommendations for treatment in older adults.
17. Identify at least 3 physiologic changes of ageing for each organ system and their impact on the patient, including their contribution to homeostenosis (the age-related narrowing of homeostatic reserve mechanisms.)
18. Generate a differential diagnosis based on recognition of the unique presentations of common conditions in older adults, including acute coronary syndrome, dehydration, urinary tract infection, acute abdomen, and pneumonia.

19. Assess and provide initial management of pain and key non-pain symptoms based on patients goals of care.
 20. Identify the psychological, social, and spiritual needs of patients with advanced illness and their family members, and link these identified needs with the appropriate interdisciplinary team members.
 21. Present palliative care as a positive, active treatment option for a patient with advanced disease.
 22. Identify potential hazards of hospitalization for all older adult patients (including immobility, delirium, medication side effects, malnutrition, pressure ulcers, procedures, peri and post operative periods, transient urinary incontinence, and hospital acquired infections) and identify potential prevention strategies.
 23. Explain the risks, indications, alternatives, and contradictions for indwelling (Foley) catheter use in the older adult patient.
 24. Explain the risks, indications, alternatives, and contraindications for physical and pharmacological restraint (measures to immobilize the patient so that he does not cause damage to self and others).
 25. Communicate the key components of a safe discharge plan (e.g., accurate medication list, plan for follow-up), including comparing/contrasting potential sites for discharge.
 26. Conduct a surveillance examination of areas of the skin at high risk for pressure ulcers and describe existing ulcers
 27. Suspect or identify physical, psychological or financial abuse of the elderly?
 28. Is familiar with the laws for the safety or to prevent the abuse of the elderly in terms of social/ financial/ physical aspect?
-

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