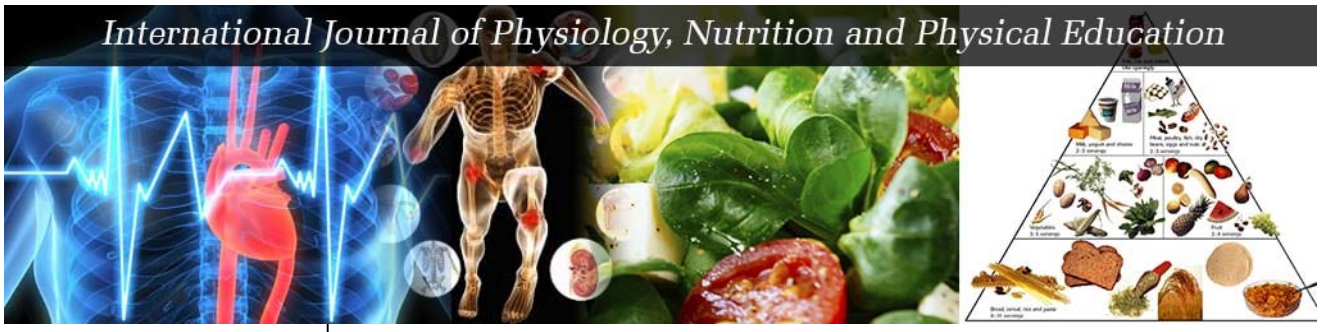

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Patterns of physical exercise amongst educated young adults residing in a metropolitan city

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Abstract
This cross-sectional descriptive study was conducted on 167 respondents (67 females: 40.12%; 100 males: 59.88%) to determine their pattern of physical exercise. The mean age of females was 19.94±1.20 years while that for males was 20.51±1.61 years. The mean body mass index was 20.88±2.39 kg/m^2 and 22.37±2.99 kg/m^2 for females and males, respectively. Among the respondents who exercised, 11.54% females and 39.77% males were exercising for more than six years; while 13.46% females and 19.32% males took dietary supplements and of these, less than one-third females and about two-thirds of males reported that their physique improved after they started consuming dietary supplements. Gender differences were significant in the pattern of physical activity. Significant gender differences (with female preponderances) were observed in the daily physical inactivity profile during waking hours: sitting (Z=2.207; p=0.027), watching television (Z=3.518; 0.0004), and Internet surfing (Z=3.311; p=0.0009).

Keywords: Educated, exercise, urban, young adults

1. Introduction
Regular physical activity improves balance, flexibility, mental health and has a positive influence on cognitive function [1] and quality of life; [2, 3] prevents osteopenia and osteoporosis; [4] and reduces the risk of hypertension, obesity, type 2 diabetes, coronary artery disease and cancers of colon, breast and endometrium [5]. Physical activity reduces risk of breast cancer risk by multiple mechanisms that include lowered adiposity, insulin resistance, sex hormone levels and inflammatory markers. [6] Physical activity protects against cardiovascular diseases by improving myocardial circulation, enhancing contractility of the myocardial muscles, reducing blood pressure, reducing anxiety, easing psychological stress, improving lipid profile, improving glycaemic control and enhancing insulin sensitivity. Though cardio-vascular diseases cause higher morbidity among men, these diseases are responsible for a greater proportion of total mortality among women (39%), as compared to that in men (36%) [7]. Regular physical activity may reduce the risk of dementia and Alzheimer's disease, especially among genetically susceptible individuals [8].
Estimates from developed countries indicate that only 15% of the people older than 18 years of age indulged in regular vigorous activity (three times a week for at least 20 min), while 60% did not report regular physical activity [9]. Habits developed in younger ages are likely to continue through to later life [10].
An estimated 392 million Indians were physically inactive, which was significantly more common in urban areas, more common in females [11]. Among those who self-reported recreational physical activity, the duration of moderate to vigorous intensity activity was less than 20 min/day [11]. A multi-city Indian study [12] found that 38.8% of men and 46.1% of women were physically inactive. A Jaipur-based study [13] reported that 69.6% of men and 52.4% of women were physically inactive. Most Indians derived most of their physical activity from the occupational domain [11], which is similar to the situation in China [14] and Vietnam [15]
Emphasizing the benefits of physical activity ("positive messaging") is a better motivator for physical activity than presenting the risks of a sedentary lifestyle ("negative messaging") [16]. Formal exercise programs require joining a gym or purchasing exercise equipment and setting

aside a daily time slot for exercising. Alternatively, one can integrate physical activity into daily life routine at home or workplace or during recreation. Examples include: daily walk or walking while socializing, riding a bicycle to the market, climbing few flights of stairs instead of taking elevators, walking to a colleague's room, parking in a distant parking lot [17].

The objective of the present study was to determine the pattern of physical exercise among educated young adult inhabitants of a metropolitan city.

2. Materials and Methods

This cross-sectional descriptive study was conducted using the chain sampling technique. A pre-tested and pre-validated questionnaire was administered via Google forms to adult respondents, of either gender, having educational attainment at least up to undergraduate level. Informed consent was taken on the Google forms. The data were adapted to Microsoft Excel spreadsheet (Microsoft Corporation, Redmond, WA, USA) and analyzed using SPSS statistical software Windows Version 25.0 (IBM Corporation, Armonk, NY, USA). For continuous data, the standard error of difference between two sample means was calculated. The 95% confidence interval was stated as: [Mean-1.96*Standard Error]-[Mean+1.96*Standard Error]. The percentage of responses and the standard error of difference between two sample proportions were calculated. The statistical significance was determined at $p<0.05$.

3. Results and Discussion

There were 167 respondents (67 females: 40.12%; 100 males: 59.88%).

3.1. Socio-demographics

The mean age of females was 19.94±1.20 years (95% CI: 19.65-20.23 years) while that for males was 20.51±1.61 years (95% CI: 20.19-20.83 years). The gender difference in mean age was statistically significant (Z=2.617; p=0.008). The maximum age was higher for males, while the third quartile, median, first quartile and minimum age was identical for both sexes (Fig-1). There were no significant gender differences in place of schooling (Z=0.806; p=0.417), education (Z=0.089; p=0.928), religion (Z=0.022; p=0.984) and occupation ((Z=0.005; p=0.992).

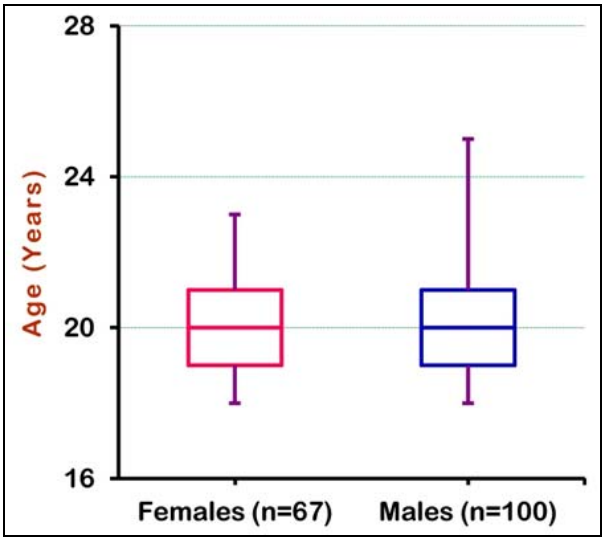

Fig 1: Box plot of age distribution

3.2. Body Mass Index

The mean body mass index (BMI) of females was 20.88±2.39 kg/m^2 (95% CI: 20.31-21.45 kg/m^2) while that for males was 22.37±2.99 kg/m^2 (95% CI: 21.78-22.95 kg/m^2). The minimum BMI was identical for both genders, but the first quartile, median, third quartile and maximum BMI was higher for males (Fig-2).

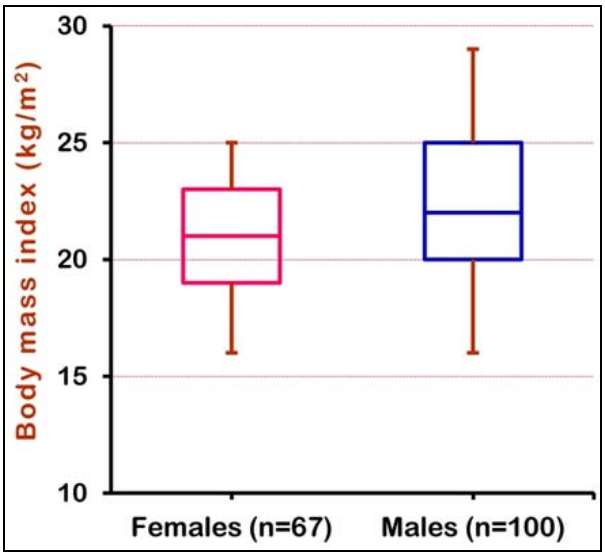

Fig 2: Box plot of distribution of body mass index

3.3. Dietary Supplements

Among the respondents who exercised, 7 out of 52 females (13.46%) and 17 out of 88 males (19.32%) took dietary supplements. The gender difference was not significant (Z=0.088; p=0.373). Only 2 out of 7 (28.57%) females and 11 out of 17 (64.71%) males reported that their physique improved after they started consuming dietary supplements, without exhibiting significant gender difference (Z=1.614; p=0.107).

3.4. Duration of Exercise

6 out of 52 female respondents (11.54%) and 35 out of 88 male respondents (39.77%) were exercising for more than six years, exhibiting significant higher physical activity in males (Z=3.547; p=0.0003). Many previously published studies [11, 18-20] have reported higher levels of physical activity in males, as compared to females.

3.5. Health Benefits

22 (42.31%) female respondents reported reduction in menstruation-related problems after they started exercising. In the present study, 46 out of 52 (88.46%) females and 71 out of 88 (80.68%) males reported feeling energetic after their daily exercise regimen, without exhibiting significant gender difference (Z=1.200; p=0.230). The "feel good" factor after exercising (including enhanced positive wellbeing and self-image) could be employed motivator to promote physical activity among older adults [21] while social factors, such as, meeting new friends, may be employed as motivators for younger adults. [22] A study [22] found that more than three out of four older adults preferred activities that can be performed alone, at little or no cost and located close to home. Improved appearance is a more likely motivator for women, as compared to men [23].

3.6. Exercise Profile

52 out of 67 female respondents (77.61%) and 88 out of 100 male respondents (88.0%) reported that they indulged in some form of physical exercise on a daily basis. (Table-1). Significant gender differences were observed for light weight lifting (Z=2.166; p=0.030), fast bicycling (Z=2.448; p=0.014), and aerobics (Z=2.167; p=0.030), while males outnumbered females in heavy weight lifting and regular bicycling. However, in recreational walking, females outnumbered males, but the gender difference was not significant (Z=1.616; p=0.105).

Table 1: Self-reported daily exercise profile

Exercise	Females (n=52)	Males (n=88)	Z value	'p' value
Heavy weight lifting	03 (05.77%)	08 (09.09%)	0.705	0.477
Light weight lifting	07 (13.46%)	26 (29.54%)	2.166	0.030 *
Fast bicycling	01 (01.92%)	13 (14.77%)	2.448	0.014 *
Regular bicycling	04 (07.69%)	13 (14.77%)	1.239	0.214
Aerobics	02 (03.85%)	14 (15.91%)	2.167	0.030 *
Recreational walking	23 (44.23%)	27 (30.68%)	1.616	0.105

Z= Standard error of difference between two proportions; *Significant

3.7. Inactivity Profile

The self-reported daily inactivity profile (no physical activity during waking hours for more than one hour per day) is depicted in Table-2. Significant gender differences (with female preponderances) were observed for sitting (Z=2.207; p=0.027), watching television (Z=3.518; 0.0004), and Internet surfing (Z=3.311; p=0.0009).

Table 2: Self-reported daily inactivity profile

More than 1 hr/day	Females (n=67)	Males (n=100)	Z value	'p' value
Sitting	60 (89.55%)	76 (76.0%)	2.207	0.027 *
Watching TV	42 (62.69%)	35 (35.0%)	3.518	0.0004 *
Internet surfing	65 (97.01%)	79 (79.0%)	3.311	0.0009 *
Video / Mobile	62 (92.54%)	85 (85.0%)	1.470	0.141

Z= Standard error of difference between two proportions; *Significant

4. Conclusion

The study revealed significant gender differences in the patterns of physical activity as well as recreational inactivity profile during waking hours, such as, sitting, watching television and Internet surfing. In view of gender differences in choice of physical activity, gender-friendly options may be made available. Formulation of national-level strategies to improve physical activity levels (especially recreational physical activity) should be part of an integrated approach to preventing lifestyle and non-communicable diseases.

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