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Journal

World Cultures eJournal, 19(1)

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Publication Date

2013

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CROSS CULTURAL COMPARISON OF ATTITUDES TOWARDS AGING AND PHYSICAL ACTIVITY

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An online cross-sectional survey was used to examine 475 adults (239 men and 236 women) on physical activity level, barriers to physical activity participation, and attitudes towards personal aging. Participants were grouped, by citizenship and residence, as Indians in India, Indians in the United States, or Americans in the United States. Cross-cultural differences were observed on self-rated general health, occurrence of preventive examinations, and several barriers to physical activity. Physical activity level was positively correlated with self-rated general health, and with optimism regarding aging, suggesting that enhanced physical activity may hold the key to a higher evaluation of personal health, and more positive expectations of aging.

Keywords: cross cultural; attitudes; aging; physical activity; India; United States of America

1. Introduction and Literature Review

India and the United States of America differ widely in various respects, including cultural background, health status, demographics, economics and urbanization (Table 1). Cultural values and traditions influence peoples' attitudes towards aging and physical activity. The urban, college-educated, and, mostly professional population, exposed to and aware of global developments, is poised on the interface of culture-specific traditions and contemporary trends. Indians who live in the United States, and especially those who have lived in the United States for several years, straddle the gap between the cultures. Attitudes towards aging have become particularly significant in view of present worldwide demographic trends. Life expectancy, and the aged component of the population, are rising progressively. Participation and productivity of older individuals in society hinge upon people's attitudes towards aging. Disparities among cultures in attitudes towards aging may pose challenges in situations in which multicultural interactions take place, e.g., an elderly Indian receiving care in a facility in the United States. There is a paucity of cross cultural assessments of attitudes towards personal aging and older adults (Kite et al. 2005) in general, and no examination of the populations addressed by this study has come to light in the literature so far.

Technological advances, the move towards longer working hours in the formal labor force, and the increasing time spent on transportation have been matched by a diminution in physical activity in most parts of the world. Differences may be expected in the attitudes towards physical activity of members of societies beset to varying degrees by the ills of overweight, obesity and chronic diseases associated with physical inactivity;

societies that place varying premiums on physical appearance; and societies that differ markedly in their health care expenditure (Table 1).

Table 1. Health-related demographics of India and the USA

Demographics	India		USA	
	Women	Men	Women	Men
Life expectancy at birth in years*	64	62	80	75
Healthy life expectancy in years*	53	54	71	67
Percentage of population > 65 years**	5		12	
Percent urbanized**	28		79	
Health expenditure per capita*	\$91		\$6,096	
Health expenditure (percentage of GDP)*	5		15.4	

* World Health Organization (2008a, b)

** Population Reference Bureau (2008a, b)

Aging

Examination of attitudes towards aging in diverse populations, of various cultures, age-groups, and among personal and professional contacts of the elderly, presents a varied picture of positive and negative beliefs and expectations of aging and aged persons, associated with respondents' culture, health status, age (Montepare and Lachman 1989; Harris, Page, and Begay 1988), gender (Harris, Page and Begay 1988), context (Thomson 1991) and available information (Lovett 1990). For example, Harris, Page, and Begay (1988) found differences among members of different ethnicities in a Southwestern US community, in their definitions and evaluation of aging and aged persons; Crew (1984) reported differences in age stereotypes among members of different races; and Sharps and coworkers (Sharps, Price-Sharps, and Hanson 1998) concluded that despite the strong tradition of filial piety and gerontocracy in Thailand, negative stereotyping of the aged was prevalent among young adult students.

Traditional Indian society is known for filial piety and a reverential attitude towards the aged (Lamb 2000; Joseph 2005). Lamb (2000) observed that aging was not a wholly undesirable phenomenon among Indians, notwithstanding a definite decline in administrative power within the family. Independence of the elderly was not valued as highly as community or connectedness, and was indeed, often interpreted as a form of filial abandonment. Lately, this stance is ceding some ground to a reinterpretation of living in "old age homes" as an expression of the independence of the elderly individual rather than a disgrace. American society, in contrast, is seen as an individual-centric one, with a high value placed on personal boundaries, self-reliance and autonomy throughout adulthood (Glendinning 1994), including old age (Joseph 2005). Joseph (2005) found in Asian Indian immigrant women, that values of filial piety and familism dominated in deliberations on the care of elderly parents, whereas values of self-reliance and employment of institutional resources came to the fore in considerations of personal

aging. This duality underscores the ongoing shift in attitudes towards aging among individuals of Indian origin, especially immigrants to the United States.

There is an apparent convergence of attitudes towards aging in the contemporary world, particularly the stance towards youthfulness in appearance, as is attested to by the growing popularity of cosmetic techniques and products to retard, mask or repair visible signs of aging (Morris 2008; Bird 2008; Mintel 2007, 2008), and the assimilation of terms suggesting youth into compliments in social discourse, across the globe.

Physical Activity

According to the United States Physical Activity statistics for the year 2007 (CDC, 2008), 48.8 per cent of Americans engaged in 'recommended'¹ levels of physical activity, 37.7 per cent engaged in 'insufficient' levels, 13.5 per cent were classified as 'inactive', and 24.1 per cent reported 'no leisure-time physical activity'. Data on physical activity were not available on a similar (nationwide) scale in India, but the evidence from data collected in various parts of the country, and projections based on the chronic disease burden and changing lifestyles, bolster the estimation that physical inactivity levels in urban India were comparable with those in the United States (Rastogi et al. 2004).

The literature on comparisons of the Indian diaspora with their relatives in India, reference populations in their adopted countries, and other ethnic groups in various parts of the world is consistent on the high incidence of cardiovascular events and disease risk factors, such as Syndrome X and physical inactivity, among persons of Indian origin (Hughes et al. 1990; Hayes et al. 2002; Wannamethee 2004; Fischbacher, Hunt, and Alexander 2004; Bhatnagar et al. 1995; Shah et al. 2005; Chitale 2010). Studies of the impact of acculturation on physical activity have thrown up diverse findings, from negative association (Williams 1995), to no impact (Hayes et al. 2002), and positive association (Jonnalagadda and Diwan 2005). Several researchers (Wannamethee 2004; Williams 1995; Reddy 1999) have commented upon the narrowing gap between physical inactivity levels among urban Indians (in India) and migrant Indians, and the reduction in physical activity with the boom in socio-economic development, consumerism, and communications that may be termed 'westernization'.

Studies conducted in India delineate the growing inactivity among adults, especially urban, middle-class individuals (Vaz and Bharathi 2000), with 'lack of time' and 'lack of motivation' the most cited barriers to the achievement of "ideal" exercise goals. Further, age- and gender-related differences have been reported in overall physical activity, categories of physical activity engaged in, and perceptions of physical activity (Bharathi, Sandhya, and Vaz 2000; Vaz and Bharathi 2004).

2. Significance of the Present Study

The physical and cognitive decline and the increasing susceptibility to illness, particularly chronic disease, that characterize aging exhibit the propensity to be attenuated by regular physical activity. Health status, which is related to physical activity participation, may reasonably be expected to impact attitudes towards personal aging. The present study examined attitudes towards aging and physical activity among Indians living in India, Indians living in the United States, and Americans living in the United States. This study, by examining attitudes towards personal aging rather than aging in general, may be considered free of the influence of preconceived notions except those entertained by participants about themselves. The examination of attitudes towards both physical activity and aging in the same population allowed this study to illuminate this relationship further and break new ground. Different geographical and cultural locales influence persons of common ethnicity variously, and immigrant populations tend to be positioned in between the populations from the culture of their origin and the population of their adopted culture on behavioral measures (Benfante 1992). In this background, the examination of the immigrant population in the present study is particularly interesting and warranted.

The following hypotheses were put forward:

1. Americans in the USA would be more physically active than Indians in the USA and Indians in India.
2. Indians in the USA would be more physically active than Indians in India.
3. Indians in the USA would express more barriers to engaging in physical activity than would Americans in the USA.
4. Indians in India would express more environmental barriers, such as of access and affordability, to engaging in physical activity than would Indians in the USA.
5. Americans in the USA would report more positive expectations of physical wellbeing, and (social) activity, and more negative expectations of psychological wellbeing, and be more likely to deny aging than Indians in the USA.
6. Indians in the USA would report more positive expectations of physical wellbeing, and (social) activity, and more negative expectations of psychological wellbeing, and be more likely to deny aging than Indians in India.
7. Physical activity level would be correlated with positive expectations of aging.
8. In individuals raised in India and resident in the United States, the length of residence in the United States would be positively correlated with physical activity level, and expectations of physical wellbeing, and (social) activity in later life, and negatively with barriers to physical activity.

3. Materials and Methods

Data collection for this study was non-invasive and anonymous, and thus exempted from full review by the Institutional Review Board. An online (internet) survey was available for a period of seven weeks on a University-hosted survey website. Self-reported demographic information and attitudes towards aging and physical activity were assessed in a convenience sample gathered by ‘snowballing’, with participants making the link to the survey instrument available to others, some of whom then chose to become participants themselves. The initial participants were among the researchers’ circle of acquaintances. Participants were given the option to participate in a lucky draw at the end of the study without violating their anonymity. The survey instrument, divided into four sections, was compiled of validated questionnaires (Gething 1994; Patrick et al. 1994; Sciamanna et al. 2004; Andajani-Sutjahjo et al. 2004) and comprised additional questions to elicit information on demographics, general health, and attitudes and correlates of physical activity and aging. Section 1 included questions on self-rating of general health, chronic disease conditions, and preventive health screenings. Section 2 ascertained the participant’s current physical activity, satisfaction with the amount of physical activity engaged in, the perceived norm of physical activity among peers, the prevalence of physical activity counseling received during a clinical encounter, and barriers to engaging in physical activity. Section 3 ascertained the participants’ contact – personal and professional – with individuals over the age of 65 years, and had participants indicate the degree of truth of statements on their expectations of personal – cognitive, physical, and psychosocial – aging, on a Likert-type scale. Section 4 elicited demographic information, e.g., generational status (grandparent/parent/child), age-group (in 10-year blocks, except for the first block of 18 to 24 years), gender, years of formal education, nationality, country raised in, and country of residence. Besides current nationality, information on which country the participants were “raised in” (operationally defined as the country in which they spent the majority of the first 20 years of their lives) was included to more closely apprehend the cultural background of the participants. The number of years of residence in the current country of residence was asked for as a marker of possible acculturation.

Participant inclusion criteria

Participation was sought from adults, conversant with English, in the following categories: (i) Indians living in India (II), (ii) Indians living in the United States of America (IA), and (iii) Americans living in the United States of America (AA).

Data analysis

Analysis of variance (ANOVA) was used to compare the three groups on scores on the various scales and subscales of the survey. Welch’s ANOVA was used to analyze variables that did not satisfy the assumption of homogeneity of variance. Post hoc

analyses were conducted to ascertain where the differences among the groups lay. Self-reported general health, age-group, gender, educational attainment, generational status, barriers to physical activity, and personal and professional contact with persons over the age of 65 years were examined as covariates. Correlations were run to ascertain associations among measures on the scales of physical activity and attitudes towards aging. The SAS 9.1 and SPSS 15.0 software packages were used to conduct the analyses, with the α set at 0.05.

4. Results

Four hundred and seventy five individuals (Table 2), of the 652 who attempted the online survey, met the inclusion criteria of being citizens of, raised in, and residents of either India or the United States of America. They were categorized as Indians in India (II) (n=146), Indians in America (IA) (n=119), and Americans in America (AA) (n=210), based on their citizenship and residence.

Table 2. Distribution of gender, age-group, generational status and educational attainment across the three groups of participants

Demographic	Categories	II	IA	AA
Gender	Male	101 (69.2%)	68 (57.1%)	70 (33.3%)
	Female	45 (30.8%)	51 (42.9%)	140 (66.7%)
Age	18-24 years	26 (17.8%)	13 (10.9%)	42 (20%)
	25-34 years	76 (52.1%)	89 (74.8%)	51 (24.3%)
	35-44 years	26 (17.8%)	14 (11.8%)	37 (17.6%)
	45-54 years	7 (4.8%)	3 (2.5%)	43 (20.5%)
	55-64 years	7 (4.8%)	0	31 (14.8%)
	65-74 years	3 (2.1%)	0	5 (2.4%)
	75-84 years	1 (0.7%)	0	1 (0.5%)
	Generation	Child	106 (72.6%)	94 (79%)
Parent		34 (23.3%)	25 (21%)	76 (36.2%)
Grandparent		6 (4.1%)	0	33 (15.7%)
0-4 years		0	0	11 (5.2%)
Education	5-9 years	3 (2.1%)	2 (1.7%)	9 (4.3%)
	10-14 years	5(3.4%)	4 (3.4%)	55 (26.2%)
	15-19 years	94 (64.4%)	48 (40.3%)	80 (38.1%)
	20+ years	44 (30.1%)	65 (54.6%)	55 (26.2%)

Note: 'II' = Indians in India; 'IA' = Indians in USA; 'AA' = Americans in USA

Self-rated general health varied significantly across the groups ($p=0.000$). II reported poorer health than IA and AA ($p<0.05$). There was no difference between IA and AA. The three populations differed in the occurrence of preventive examinations (Chi square, $p<0.0001$) (Table 3). The majority of Indians in India did not undergo preventive examinations, Indians in the United States were fairly equally divided between

undergoing and not undergoing preventive examinations, and the majority of Americans in the United States underwent preventive examinations. The occurrence of physical activity counseling by healthcare providers was not different across the populations (Chi square, $p=0.3$). Groups did not differ on ratings of amount of personal physical activity, and peer-referenced comparisons. Seventy-six percent of the participants reported obtaining less physical activity than they desired, 23 percent reported that their amount of physical activity was just right, and one percent reported more physical activity than they desired. Forty percent of the participants rated their amount of physical activity as greater than that of their peers (of the same age and culture), 37.5 percent reported similar levels of physical activity as their peers, and 22.5 percent reported less physical activity than their peers.

Table 3. Occurrence of preventive examinations across the three groups

Group	No preventive examinations	Preventive examinations	Total
II	93 (63.7%)	53 (36.3%)	146
IA	56 (47.06%)	63 (52.94%)	119
AA	53 (25.24%)	157 (74.76%)	210
Total	202 (42.53%)	273 (57.47%)	475

Chi-square, $p < 0.0001$. 'II' = Indians in India; 'IA' = Indians in USA; 'AA' = Americans in USA

The hypothesis that II would express more environmental barriers, such as of access and affordability, to engaging in physical activity than would IA was supported by the data. The following barriers were associated with group membership: 'inadequate enjoyment', 'inadequate information', 'inadequate access', 'lack of inexpensive facilities', and 'inadequate time due to family commitments' (Table 4).

Table 4. Scores (mean + standard deviation) on measures of current physical activity, barriers to physical activity and attitudes towards aging, with group as the fixed factor

Dependent variable	II (146)	IA (119)	AA (210)
Current PA*	2.70 + 1.87a	3.19 + 2.04ab	3.55 + 2.28b
Barriers sum*	5.77 + 4.14a	4.07 + 3.27b	5.44 + 3.72a
Inadequate enjoyment*	0.49 + 0.73a	0.29 + 0.54b	0.55 + 0.71a
Inadequate information*	0.48 + 0.68a	0.18 + 0.43b	0.15 + 0.41b
Inadequate access*	0.73 + 0.83a	0.28 + 0.62b	0.49 + 0.69c
Lack of inexpensive facilities*	0.62 + 0.77a	0.21 + 0.54b	0.54 + 0.72a
(optimism with respect to) anxiety about ageing*	2.01 + 7.22a	2.50 + 7.18a	-0.46 + 7.09b
(avoidance of) denial of ageing*	1.05 + 3.57a	1.13 + 3.09a	0.16 + 3.22b
(expectation of) activity*	1.40 + 2.16a	0.76 + 2.39a	2.11 + 2.13b

*ANOVA group differences, $p < 0.05$; different lower case letters denote differences between the groups "II" = Indians in India; "IA" = Indians in USA; "AA" = Americans in USA

The hypothesis that physical activity level would be correlated with positive expectations of aging was also supported by the data. In the overall sample (n=475), current physical activity was found to correlate positively with overall attitude towards aging ($p=0.002$), as well as expectation of physical wellbeing ($p=0.000$) in later life, and inversely with summed barriers to physical activity ($p=0.000$).

The other hypotheses were not borne out by the data. Following are the findings that were the opposite of those hypothesized: (a) IA would express more barriers to engaging in physical activity than would AA: II and AA did not differ significantly from one another, but IA expressed lower barriers than both II and AA; (b) For individuals raised in India and resident in the United States, the length of residence in the United States would be positively correlated with physical activity level, and expectation of physical wellbeing and (social) activity in later life, and negatively with barriers to physical activity: Among those raised in India and resident in the United States (n=135), length of residence in the United States was positively correlated with barriers of inadequate skills ($p=0.02$), lack of inexpensive facilities ($p=0.000$), and inadequate time due to family commitments ($p=0.005$). Among Indian citizens living in the United States (IA, n=119), length of current stay in the United States was found to be positively related to lack of inexpensive facilities ($p=0.008$).

Analysis of variance revealed that groups (II, IA and AA) differed on their likelihood of being anxious about aging ($p=0.000$), denying aging ($p=0.000$), and expectation of being socially active in later years ($p=0.000$). Further, there were group differences on the sum of the barriers to physical activity ($p=0.001$), with Indians in the United States (IA) reporting the lowest level of barriers of the three groups. Participants who reported no personal contact with persons over the age of 65 years expressed more positive expectations of (lower levels of anxiety about) their personal aging ($p=0.002$). Those who reported personal contact had higher expectations ($p=0.04$) of being socially active in later years.

Analysis of covariance (ANCOVA) was performed on all the scores of interest, viz. physical activity, barriers to physical activity, and attitudes towards aging, with group (II, IA or AA) as the fixed factor, and various demographic variables and scores on other scales as covariates. Self-rated general health was used as a covariate in all analyses as it is known to predict likelihood of exercising, and found to be inversely associated with Body Mass Index and depression (Meurer, Layde, and Guse 2001). ANCOVA revealed that differences in current physical activity among the groups were found to be, in fact, related to the general health, generation, age, gender and barriers to physical activity experienced by the participants and not to group membership *per se*.

Group ($p<0.0001$), general health ($p=0.03$), age ($p=0.0007$), education ($p=0.02$), and country raised in ($p=0.003$) were associated with summed barriers to physical activity. Post-hoc analysis revealed that II and AA did not differ significantly from one another,

but IA expressed significantly lower barriers than did both II and AA. ANCOVA and post hoc analysis conducted on each barrier yielded the following observations: Both II and AA found inadequate enjoyment of physical activity impeding their participation in physical activity more than did IA. II experienced the obstacle of inadequate information on how to increase their physical activity more than the groups resident in the United States did. II experienced inadequate access to places in which to engage in physical activity more than did AA, who, in turn, experienced this barrier more than did IA. IA were impeded less than both II and AA by a lack of inexpensive facilities to engage in physical activity.

ANCOVA showed that attitudes to aging were associated with self-rated general health ($p<0.05$), gender ($p<0.05$), personal contact with persons over the age of 65 years ($p=0.01$), professional contact with persons over the age of 65 years ($p=0.04$), and country raised in ($p=0.02$), rather than group membership.

5. Discussion

This study examined attitudes towards aging and physical activity among Indians living in India, Indians living in the United States, and Americans living in the United States. Specific hypotheses were proffered with respect to the relative levels of physical activity, barriers to physical activity, and attitudes towards aging of the three groups studied. Several similarities and differences were revealed among the groups, bearing out some of the hypotheses and refuting several.

Self-rated general health and preventive care examinations

Indians in India were found to rate their general health lower than both Indians in the United States and Americans in the United States, whose ratings did not differ from each other. The occurrence of preventive care examinations was found to vary greatly among the three groups, as expected. Individuals bear over 70 per cent of the expenditure on healthcare in India, with the remainder borne by government and non-governmental bodies and some private agencies (BearingPoint, Inc. 2008). Formal health insurance is either out of the reach of, or not patronized for reasons other than affordability, by all but about ten per cent of Indians (WHO 2008c). India has traditionally been a land of communicable diseases, modest life expectancy, high levels of occupational physical activity and moderate nutritional intakes. Hitherto, this meant that preventive care was not salient in the health ethos of India except in the face of disease symptomatology, overwhelming family history, or administrative requirements related to jobs or travel. In recent decades, the health scenario of India is one of epidemiological transition featuring both communicable, and non-communicable, chronic diseases mostly associated with lifestyle changes.

The Indians reached by this study clearly belong to the well-educated section of society, as even the mere fact of their ability to access, understand and undertake the survey indicates. This is a section better informed about chronic diseases, and possibly one more exposed to lifestyle-related health deficits. Some, if not most, of the employed members of this group, are also likely to have employer-sponsored health insurance. These circumstances may account for the occurrence of preventive examinations, low as it is relative to the other groups, in this population. Indians living in the United States (IA) have to balance traditional values regarding preventive care with system requirements such as health status certification and compulsory insurance as part of the mandatory prescription for enrollment in an educational institution or employment. The tendency towards the earlier development of chronic diseases and behavioral and metabolic risk factors, such as physical inactivity and Syndrome X, in expatriate Indians is another factor that could compel this group to undergo preventive care examinations. Furthermore, the ambience of disease-prevention in the United States could exert a hortatory influence on them, raising the likelihood of their seeking preventive care. The majority of the Americans in the United States (AA) reported undergoing preventive examinations. This is not unexpected considering that the majority of Americans have health insurance, and that preventive care is emphasized by public health organizations in the background of widespread prevalence of chronic diseases and their risk factors.

Provider counseling

The similarity in the occurrence of provider counseling on physical activity across the groups is interesting in light of the differences in occurrence of preventive examinations. With the lower self-rated general health in Indians in India (II) than in the two groups resident in the United States (IA and AA), it is conceivable that some of the counseling on physical activity that took place in the II group occurred during sick visits rather than preventive care visits and was stimulated by the patients' suboptimal health.

Physical activity ratings

Self-assessment of the amount of physical activity obtained against the amount desired was remarkably similar across the groups. Peer-referenced physical activity ratings showed parallel trends, with the majority of participants (77.5 per cent) reporting that they obtained as much physical activity as their peers, or more, even as the majority (76 per cent) desired to obtain more themselves. The two ratings taken together suggest an understanding among people that the population in general does not achieve as much physical activity as it ideally should. The proportion of the participants in this study satisfied with their level of physical activity (24 per cent) was lower than the 30 to 32 per cent observed in surveys of urban middle-class Indians by Vaz and Bharathi (2000).

Differences in attitudes towards aging and physical activity

When analysis of covariance was conducted to arrive at a better understanding of the differences demonstrated by analysis of variance of the factors associated with the variables of interest in this study, membership of a particular group (II, IA, or AA) was not found to be related to physical activity level or attitudes towards aging, but was significantly associated with certain barriers to physical activity. A point to keep in mind, while considering the nature of the barriers to physical activity reported by the three groups, is the special status of many of the participants in the sample IA: Going by the age-groups and trends in international residence and occupations, the majority of the participants in sample IA are expected to be students and professionals. The fact that the barriers 'inadequate access' and 'lack of inexpensive facilities' did not figure prominently in this group is understandable since free, or at least affordable, facilities for physical activity are the norm in educational institutions and several professional firms.

Individuals who did not report personal contact with persons over the age of 65 years reported greater optimism with respect to their own aging: This gives the appearance of being a function of the quality of life that those with personal contact may have observed in their personal acquaintances of older ages. Those who did not report contact could quite possibly be basing their expectations of their own aging on their current quality of life, uninfluenced by close examination of older individuals. Professional contact with persons over the age of 65 years was related to expectation of psychological wellbeing, and avoidance of denial of ageing. It seems plausible that these participants interacted with elderly persons who were leading active lives, whether sick or not, and that such contact did not undermine their confidence about their own aging.

Self-rated health status was found to be significantly associated with physical activity level, summed barriers to physical activity, anxiety about ageing, expectation of physical wellbeing, and expectation of psychological wellbeing. The relationship between self-rated health and physical activity level has been confirmed in earlier investigations (Meurer, Layde, and Guse 2001). The logical extension of this relationship is the one between general health and barriers to physical activity. It stands to reason that general health and physical activity may feed each other with better health enabling one to participate in physical activity, which in turn enhances health. The association between general health and expectation of physical and psychological wellbeing later in life, and anxiety about aging, is fairly straightforward, as extrapolation from current state of health is quite natural in the visualization of the future.

The overall study population demonstrated a positive correlation between physical activity level and attitudes towards aging, as hypothesized. In view of the multifaceted enhancement of health brought about by engaging in physical activity, and the probable extrapolation from current good health to expectation of healthy aging, this correlation is most logical.

Among individuals raised in India and living in the United States, length of stay in the United States was found to correlate positively with the following barriers to physical activity: 'inadequate skills', 'lack of inexpensive facilities', and 'inadequate time due to family commitments', in contradiction to the hypotheses put forward. It is possible that with the wide array of physical activities that could potentially be engaged in, in the United States, in contrast to India, individuals, over the years, attempt new ones and find themselves constrained by the boundaries of their skills. A similar mechanism might be at work with respect to the barrier of affordability. Most educated Indians move to the United States to pursue higher education or employment. It seems more likely that they explore new activities that may be expensive to pursue than that their financial solvency drops with time. Another factor that could be responsible for both this barrier and the one related to conflicting family commitments is the growth of the family over time, especially in view of the relative youth of the sample of participants in group of Indians living in the United States.

Strengths and limitations of the study

To the knowledge of the researchers, this is the first study that has investigated these three populations, i.e., Indians in India, Indians in the United States, and Americans in the United States, with a view to ascertaining their relative positions on the correlates and determinants of physical activity and attitudes towards aging. The large sample size (n=475), which allows confidence in the drawing of inferences from the data, is a plus point. Another valuable feature of this study is the combination of issues that it examined, viz. physical activity, barriers to physical activity participation, preventive counseling, and attitudes towards personal aging, permitting the assessment of relationships among these variables. The design of the study maximized the convenience of the respondents by collecting data anonymously, and by allowing respondents to participate in the survey at a time and place of their choice.

This study was hampered by the non-uniform distribution of participants from different demographic categories, making it difficult, in some cases, to disentangle the association of certain factors with variables of interest from certain other factors, e.g., gender from population group. Also, as data were collected anonymously, it was not possible to follow-up participants for clarification on missing data. It would have been interesting to delve deeper into the specifics of physical activity; the family income as a marker of socio-economic status; and the perceived societal norms and expectations as well as behavioral control experienced by the participants. However, exploring these questions would have led to a much protracted, and thereby forbidding, survey. As the survey was disseminated by 'snowballing', the sample cannot be considered truly random, and representative of the populations of the countries of interest. Nevertheless, it is expected that the study sample is typical of the educated, professional, middle-class segment of the populations of the countries examined.

Conclusions

This cross-cultural survey revealed several similarities, such as those between physical activity ratings, and numerous differences among Indians living in India, Indians living in the United States, and Americans living in the United States on their attitudes to physical activity and aging. The principal differences lay in evaluation of several barriers to physical activity and attitude towards denial of aging.

The generations of participants in this study, particularly those raised in India, may be seen as transition generations, in whose lifetimes quantum changes have occurred, and continue to occur, in global information transfer, societal trends, lifestyles, and cultural values. While they are not representative samples of their entire nations, they are representative of the sliver of society that is most probably of the upper middle class, well-educated, well-informed, aware of global trends, generally socially mobile, and at the forefront of international interactions. In the milieu of the global trend towards convergence of values and lifestyles, it is particularly remarkable that differences are revealed in the attitudes towards aging and physical activity in these populations. As global travel and migration trends evolve further, more studies such as this one, and the examination of more diverse sections of society, are merited.

This study provided the opportunity to examine attitudes towards both physical activity and aging, and demonstrated a positive correlation between these measures, and self-rated general health. In view of these associations, the message rings out that the key to better health and a more positive attitude towards aging may lie in enhanced physical activity.

6. Acknowledgements

Our thanks to the Center on Aging and the Life Course, and the Department of Health and Kinesiology, Purdue University, West Lafayette, Indiana; the friends who disseminated the survey electronically; and all the participants in this study.

7. Notes

1. ≥ 30 minutes/day of moderate-intensity activity on ≥ 5 days/week, or vigorous-intensity activity for ≥ 20 minutes/day, on ≥ 3 days/week, or both.

8. References

- Andajani-Sutjahjo, S., K. Ball, N. Warren, V. Inglis, and D. Crawford
 2004 Perceived personal, social and environmental barriers to weight maintenance among young women: A community survey. *International Journal of Behavioral Nutrition and Physical Activity* 1:15. Archived at <http://www.ijbnpa.org/content/1/1/15>.
- BearingPoint, Inc.
 2008 *Private Health Insurance in India: Promise and Reality*. United States Agency for International Development. Available at http://www.usaid.gov/in/Pdfs /promise_reality.pdf.
- Benfante, R.
 1992 Studies of cardiovascular disease and cause-specific mortality trends in Japanese-American men living in Hawaii and risk factor comparisons with other Japanese populations in the Pacific region: A review. *Human Biology; An International Record of Research* 64(6):791–805.
- Bharathi, A. V., N. Sandhya, and M. Vaz
 2000 The development and characteristics of a physical activity questionnaire for epidemiological studies in urban middle-class Indians. *The Indian Journal of Medical Research* 111: 95–102.
- Bhatnagar, D., I. S. Anand, P. N. Durrington, et al.
 1995 Coronary risk factors in people from the Indian subcontinent living in West London and their siblings in India. *Lancet* 345(8947):405–409.
- Bird, K.
 2008 Growth in anti-aging market driven by younger consumers. *Cosmetics design–Europe.com*. Retrieved from <http://www.cosmeticsdesign-europe.com/news /ng.asp? id=83850>.
- Centers for Disease Control and Prevention
 2008 *U.S. Physical Activity Statistics*. Retrieved from <http://apps.nccd.cdc.gov/PASurveillance/StateSumResultV.asp>.
- Chitale, S. B.
 2010 Studies confirm high cardiovascular risk for Indians. *Indian Weekender: Pulse of the Kiwi Indian Community*. Accessed May 14, 2010 at <http://www.indianweekender.co.nz/Pages/ArticleDetails/7/1103/New Zealand/Studies-confirm-high-cardiovascular-risk-for-Indians>.
- Crew, J. C.
 1984 Age stereotypes as a function of race. *Academy of Management Journal* 27:431–435.
- Fischbacher, C. M., S. Hunt, and L. Alexander
 2004 How physically active are South Asians in the United Kingdom? A Literature Review. *Journal of Public Health* 26(3): 250–258.

- Gething, L.
1994 Health professional attitudes towards ageing and old people: Preliminary report of the Reactions to Ageing Questionnaire. *Australian Journal on Ageing*. 13(2):77–81.
- Glendinning, C.
1994 “*My Name is Chellis & I’m in Recovery from Western Civilization.*” Boston, Massachusetts: Shambhala Publications.
- Harris, M. B., P. Page, and C. Begay
1988 Attitudes toward aging in a Southwestern sample: Effects of ethnicity, age, and sex. *Psychological Reports* 62:735–746.
- Hayes, L., M. White, N. Unwin, R. Bhopal, C. Fischbacher, J. Harland, K. and K. G. M. M. Alberti,
2002 Patterns of physical activity and relationship with risk markers for cardiovascular disease and diabetes in Indian, Pakistani, Bangladeshi and European adults in a UK population. *Journal of Public Health Medicine* 24(3):170–178.
- Hughes, K., P. P. Yeo, K. C. Lun, A. C. Thai, K. W. Wang, and J. S. Cheah
1990 Physical activity in Chinese, Malays and Indians in Singapore. *Annals of the Academy of Medicine, Singapore* 19(3):326–329.
- Jonnalagadda, S. S. and S. Diwan
2005 Health behaviors, chronic disease prevalence and self-rated health of older Asian Indian immigrants in the U.S. *Journal of Immigrant Health* 7(2):75–83.
- Joseph, V. E.
2005 *Attitudes Towards the Elderly and Caregiving among Asian Indian Immigrants Residing in Cincinnati*. M.A. Thesis. Division of Research and Advanced Studies, University of Cincinnati. Available at: <http://www.ohiolink.edu/etd/view.cgi?ucin1105732594>
- Kite, M. E., G. D. Stockdale, B. E. Whitley, Jr., and B. T. Johnson
2005 Attitudes toward younger and older adults: An updated meta-analytic review. *The Journal of Social Issues* 61(2):241–66.
- Lamb, S.
2000 *White Saris and Sweet Mangoes: Aging, Gender, and Body in North India*. Berkeley and Los Angeles, California: University of California Press.
- Lovett, L.
1990 A question of attitude. *Nursing Standard* 2(51):30–31.
- Meurer, L. N., P. M. Layde, and C. E. Guse
2001 Self-rated health status: A new vital sign for primary care? *Wisconsin Medical Journal* 100(7):35–39.

- Mintel
 2007 Anti-Aging Skincare Treatments in the United States 2007. *Research and Markets*. Retrieved from http://www.researchandmarkets.com/reportinfo.asp?report_id=459081.
 2008 Facial Skincare in the United States 2008. *Research and Markets*. Retrieved from <http://www.researchandmarkets.com/reports/c83624>.
- Montepare, J. M. and M. E. Lachman
 1989 “You're only as old as you feel”: Self-perceptions of age, fears of aging, and life satisfaction from adolescence to old age. *Psychology and Aging* 4(1):73–78.
- Morris, G.
 2008 Variety of global trends converge to bolster growth of anti-ageing products and services. In-cosmetics: In Amsterdam: 15-17 April 2008. Retrieved from <http://www.in-cosmetics.com/page.cfm/Link=218>.
- Patrick, K., J. Sallis, B. Long, K. J. Calfas, W. Wooten, G. Heath, and M. Pratt
 1994 A new tool for encouraging physical activity: Project PACE. *Physician and Sports Medicine* 22(11):45–55.
- Population Reference Bureau
 2008a Data by Geography > India > Summary. Retrieved from http://www.prb.org/Datafinder/Geography/Summary.aspx?region=139®ion_type=2.
 2008b Data by Geography > United States > Summary. Retrieved from http://www.prb.org/Datafinder/Geography/Summary.aspx?region=70®ion_type=2.
- Rastogi, T., M. Vaz, D. Spiegelman, K. S. Reddy, A. V. Bharathi, M. J. Stampfer, W. C. Willett, and A. Ascherio
 2004 Physical activity and risk of coronary heart disease in India. *International Journal of Epidemiology* 33(4):759–767.
- Reddy, K. S.
 1999 Primordial prevention of coronary heart disease in India: Challenges and opportunities. *Preventive Medicine* 29: S119–123.
- Sciamanna, C. N, M. G. Goldstein, B. H. Marcus, K. Lawrence, and B. M. Pinto
 2004 Accuracy of recall of exercise counseling among primary care patients. *Preventive Medicine* 39(6):1063–1067.
- Shah, T., S. S. Jonnalagadda, J. R. Kicklighter, S. Diwan, and B. L. Hopkins
 2005 Prevalence of metabolic syndrome risk factors among young adult Asian Indians. *Journal of Immigrant Health* 7(2):117–126.
- Sharps, M. J., J. L. Price-Sharps, and J. Hanson
 1998 Attitudes of young adults toward older adults: Evidence from the United States and Thailand. *Educational Gerontology* 24:655–660.
- Thomson, H.
 1991 Attitudes to old people: a review. *Nursing Standard* 5(31):33-5.

Vaz, M., and A. V. Bharathi

- 2000 Practices and perceptions of physical activity in urban, employed, middle class Indians. *Indian Heart Journal* 52:301–306.
- 2004 Perceptions of the intensity of specific physical activities in Bangalore, South India: Implications for exercise prescription. *Journal of the Association of Physicians of India* 52:541–544.

Wannamethee, S.G.

- 2004 Commentary: Prevention of coronary heart disease in South Asia--containing the physical inactivity epidemic. *International Journal of Epidemiology* 33(4):767–768.

Williams, B.

- 1995 Westernized Asians and cardiovascular disease: Nature or nurture? *Lancet* 345(8947):401–402.

World Health Organization

- 2008a WHO> Countries > India. Retrieved from <http://www.who.int/countries/ind/en/>
- 2008b WHO> Countries > United States of America. Retrieved from <http://www.who.int/countries/usa/en/>
- 2008c Evidence & Health Information: Regional Overview of Social Health Insurance in South-East Asia. Annex 2: Health Insurance in India: Current Scenario. Available at http://www.searo.who.int/LinkFiles/Social_Health_Insurance_an2.pdf