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THE STUDY OF RELATIONSHIP BETWEEN PHYSICAL FITNESS AND HEALTH RELATED QUALITY OF LIFE AMONG INDIAN FEMALE STUDENTS

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Abstract: *Physical activity has enormous potential to improve health and well-being. It is being widely accepted as beneficial to physical and mental health. This paper aims to examine the relationship between physical fitness and health related quality of life .It is conducted in the state of Kerala in India. This study employs a cross-sectional survey administered to a quota sample of 200 female university students (Mage = 20.9, ± 1.8) .They were assessed utilizing PF measurement, and questionnaire including the Medical Outcomes Study 36-item Short-Form Health Survey (MOS SF-36). All data collected were assessed by using Pearson Bivariate Correlations. All statistical analysis was accomplished using SPSS (v.16). The results of this research showed that there are positive significant between physical fitness and vitality and also social functioning (P<0.05). Thus, present research reinforced and implemented the importance of increasing physical fitness for better some dimension of Health Related Quality of Life.*

Key words: Female Student; Health related quality of Life; Physical activity; Physical Fitness.

INTRODUCTION

Fitness is not a fad, it's a way of life and doing physical activity (PA) is one of the many health life styles that contribute to optimal health and quality of life. Unlike heredity, life styles can be changed to improve fitness and health [1].

Physical fitness is on a continuum and is often defined in relation to a person's life style and energy needs. Physical fitness is commonly defined as the ability to handle normal physical demands of life, to have ample energy to perform variety of leisure time activities, and still be able to function effectively in emergency situations. According to the American Association of Health, Physical Education

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and Recreation fitness refers that state which characterizes the degree to which a person is able to function efficiently [2]. Fitness is an individual matter, it implies the ability of each person to live most effectively with potential ability to function depends upon the physical, moral, mental, emotional, social and spiritual components of fitness all of which is related to each other and is mutually dependent.

Although the development of physical ûtness is the result of many things, optimal physical ûtness is not possible without regular physical activity. Physical activity plays an essential role in enhancing physical fitness and health-related behavior, prolonging life, improving health-related quality of life (HRQL), enhancing weight management, and lowering the risk of morbidity and mortality from diseases, and has a positive influence on various medical disorders [3-6]. While physical activity is a pivotal factor on physical fitness [7], Nieman indicated that low fitness level has become the most important indicator of all the risk factors for premature death [8].

Exercise and fitness behaviors today can affect the health in future. Physical activity is regarded as an essential element in maintaining and improving the quality of life (QoL). Quality of life is an important dimension of health. It is a subjective term which varies from person to person and depends on each individual's capacity to cope with a situation. Quality of life can be defined as a person's sense of well-being, which is based on his/her satisfaction from the areas of life that is important for him/her [9]. While physical activity can indirectly improve subjective well-being and quality of life by keeping disease and premature death at bay [10-12], there has recently been an increasing interest in its direct role in the prevention and treatment of mental health problems as well.

Some researchers addressed the impact of Physical activity on perceived health in students and found that persons attaining recommended Physical activity guidelines were more likely to have better overall HRQL and perceived health status [3, 13, 14]. The PA levels of college students are currently below the levels thought to be sufficient to promote health benefits [3, 15].

A systematic review has reported a consistent association of higher health-related quality of life (HRQoL) scores with higher Physical activity levels among healthy adults [16]. Physical activity has enhanced well-being and increasing physical functioning also in people with poor health [17].

Lemanne *et al.* in their study addressed physical activity is a intervention that can improve quality of life, reduce the risk factors of disease, and improve general health and well-being [18].

There is still limited and insufficient evidence regarding the relationships of objectively measured physical fitness and individual domains of HRQoL in

younger adults. One recent study has reported associations between cardiorespiratory fitness and HRQoL in young males in United States navy. They found a positive relationship between submaximal fitness test and mental and physical components of HRQoL [19]. Taymoori & Lubans suggested that the lack of knowledge regarding the mechanisms responsible for behavior change may explain the low levels of effectiveness in Physical activity interventions among individuals [20]. Despite the well-known importance of physical activity in quality of life and well-being, inactivity and sedentary lifestyles were prevalent throughout the global populations [6]. Hence, in a survey approach, the basic inquiries of this study will be to ascertain the associations of Physical fitness and HRQoL. In an attempt to raise the awareness of university physical education teachers and Physical fitness professionals towards the utmost importance of the realization of the physical, psychological, and emotional domain of Physical fitness towards health. Research revolving around health related quality of life is extremely important because of the implications that it can have on current and future treatments and health protocols. On the other hand, well-executed health related quality of life research informs those tasks with health rationing or anyone involved in the decision-making process of agencies and can help identify needs for health policies and legislation, help to allocate resources based on unmet needs, guide the development of strategic plans, and monitor the effectiveness of broad community interventions. Hence, this factor is worth studying and has prompted this research. There is still limited evidence on relationships of objectively measured fitness and individual domains of HRQoL among Indian females, the specific purposes of this study was to investigate the relationship between physical fitness and health related quality of life among Indian female university students.

METHODS

In a cross-sectional study, 200 female students between 17 to 27 ages (mean age = 20.9, ± 1.8 years) of Kerala University in India were recruited. Considering extent statistical community and nature of research is used randomly selecting method for select sampling. All subjects were full-time female students who were asked to sign an informed consent form before filling in the Demographic Form and Short-form General Health Survey (SF-36) [21]. Before some measures of physical fitness tests were administered. Prior to the administration of the test, the investigator will meet with the subjects personally and the objective and purpose of the test will be made clear to them so that they are aware of what they are expected to do.

MEASURING INSTRUMENTS

Medical Outcomes Study (MOS) SF-36 [21] and PF tests were utilized in this study.

PHYSICAL FITNESS

The measurement of PF included the following: (1): 3-minute Skubic and Hodkins Step test for measuring cardiovascular function, (2): body mass index (BMI) indicating body composition was obtained by measuring height and weight while the participants were wearing lightweight clothing, (3): 1-minute sit ups for measuring muscular strength, (4): Sit and Reach Test for measuring flexibility and (5): Isometric grip strength for measuring grip strength of both hands. Before testing commenced, supervisors demonstrated the technically correct way to perform each test; they also controlled the performance technique of each person. After the above Physical fitness scores were obtained, each of the measured fitness scores were converted into standardized z scores by using the formula: X"M divided by SE (SD/√Z), and the total PF test scores was the sum of individual standardized *z* scores of BMI, muscular endurance, cardiovascular function, grip strength and flexibility scores.

HEALTH-RELATED QUALITY OF LIFE (HRQOL)

In public health and in medicine, the concept of health-related quality of life refers to a person's or group's perceived physical and mental health over time. The health-related quality of life (HRQOL) in this study was assessed using the SF-36 questionnaire. Health is defined as a dynamic state of human wellbeing characterized by a physical, mental and social potential affected by "health" as defined above. HRQL has been introduced to assess people's health status. To date, a number of questionnaires have been developed to evaluate HRQL, and the 36-item Short Form Health Survey (SF-36) is the most commonly used. The SF-36 is a generic measure, meaning that its concepts are not specific to any age (e" 14 years old), disease, or treatment group. It is a self-reported general health status survey and is suitable for self-administration, needing only 5 minutes to fill in. It has been proven useful in monitoring population health, estimating the burdens of different diseases, monitoring outcome in clinical practice and evaluating medical treatment effects. It has been translated into many languages with its content examined cross cultures [22, 23].

In addition, SF-36 has been used as an instrument for assessing quality of life world-wide. Normative data have also been obtained in many countries [24]. That is a generic multidimensional instrument consisting of eight multi-item components representing physical functioning (PF; the extent to which health limits physical activities, such as self-care, walking and climbing stairs); role functioning physical (RP; the extent to which physical health interferes with work or other daily activities); bodily pain (BP; the intensity of pain and the effect of pain on normal work, both inside and outside the home); general health perceptions (GH; personal evaluations of current health, health outlook and resistance to illness); vitality (VT; feeling full of energy rather than tired and worn out); social functioning (SF; the

extent to which physical health or emotional problems interfere with normal social activities); role functioning emotional (RE; the extent to which emotional problems interfere with work or daily activities); mental health (MH; general mental health including depression, anxiety, behavioral-emotional control, and general positive affect) [25]. The SF-36 scales were scored according to published scoring procedures, each expressed with values from 0 to 100 (0 = poor health) [21].

To obtain reliability was used test of Cronbach's alpha. In current study Cronbach's alpha coefficient for HRQOL Questionnaire was %75 so this paper provides conclusive evidence that the questionnaire is reliable.

STATISTICAL ANALYSIS

SPSS version 16 was used to undertake the analysis. Both descriptive and inferential statistics were used to investigate. The descriptive statistics were mean, Variance, standard deviation and also Pearson correlation coefficient were computed to examine the relationship between physical fitness and health related quality of life.

RESULTS

The descriptive data of the subjects are presented in Table 1.

Table 1
Health-related quality of life and physical fitness (n = 200)

Variables	*Minimum*	*Maximum*	*Mean*	*Std. Error*	*Std. Deviation*	*Variance*
PF*	5.00	100.00	67.6250	1.825	25.81310	666.316
RP *	.00	100.00	60.0120	2.580	36.49698	1.332E3
RE *	.00	100.00	44.3525	2.567	36.31476	1.319E3
VT*	20.00	100.00	58.5500	1.023	14.48088	209.696
MH*	28.00	96.00	60.0400	1.074	15.20111	231.074
SF*	.00	87.00	53.8250	1.494	21.13594	446.728
BP*	1.00	9.00	5.2750	.166	2.35096	5.527
GH*	10.00	90.00	60.8350	1.105	15.63715	244.520
HRQoL*	26.60	92.60	60.2565	1.078	15.25202	232.624
BMI**	14.73	32.4	20.43	0.1891	2.68	1.000
Right.Hand.Strengh	13.00	39.40	25.60	0.387	5.48	1.000
Left.Hand.Strengh	11	36.10	24.41	0.388	5.50	1.000
Flexibility	11	46	30	0.530	7.50	1.000
Sit.up	.00	54	26.5	0.874	12.37	1.000
Vo_2max	18.35	114.79	66.01	1.275	18.04	1.000
P.F (standardization)**	-10.36	8.22	.0000	0.189	3.74334	14.013

*PF= Physical functioning, RP= Role functioning physical, RE= Role functioning emotional, VT= Vitality, MH= Mental health, SF= Social functioning, BP= Bodily pain, GH= General health, HRQoL= Health - related quality of life
**BMI= Body max index, PF= Physical fitness

There is considered (Table 2) the Pearson correlation coefficients and significance levels, The results of this study showed that there was a positive significant correlation between right hand strength and vitality, right hand strength and social functioning, left hand strength and vitality, flexibility and social functioning, vo_2max and vitality, respectively. Also this results showed that between physical fitness in general and vitality and also social functioning there are positive significant ($P<0.05$).

DISCUSSION

Results of the present study showed that University female students with higher physical fitness and some indexes were associated with more favorable scores in the social functioning and higher vitality. The importance of physical fitness was supported only the good and satisfactory physical fitness lead to have better physical health or emotional problems interfere with normal social activities with no fatigue which refer to feeling full of energy rather than tired and worn out but not high HRQoL. Our findings are not in line with some portions of Pedersen & Saltin, Gladys Shuk-Fong Li et al. and Brosnahan et al. studies, which physical activity was linked with improved psychological wellbeing, and health-related behavior [25, 4, 26, 5] and also is not in line with Chaddock which a high fitness level, specifically cardiovascular fitness, can improve quality of life and make ordinary tasks easier [27].

In contrast, we found no significant correlation among physical fitness with other six variables of the HRQoL, including physical functioning, Role functioning physical, Role functioning emotional, bodily pain, mental health, and General health. A possible reason for this might be that 90% of students consider themselves healthy even if they are not "feeling well" [28]. The majority of university students might have a misconception in perceiving their health which is different from their health data examined. Sundblad et al. reported a discrepancy between how students rated their health and their reported data from their physical checkup [3]. Also this finding was in line with some other studies that did not find a significant relationship between BMI and HRQoL [29, 30]. The confounding results of different studies may be partly explained by differences in the gender, sample size, age, and range of BMI of the participants. Although Kaufman *et al.* and Baranowski addressed when we speak about fitness we include the state of well-ness that is defined as a multidimensional state of being describing the existence of positive health in an individual as exemplified by quality of life and a sense of well-being [31, 32] but, Paoli & Bianco explained physical fitness is neither health, nor well-ness [33]. There is considerable evidence that physical fitness, and the behaviors that build it, can reduce risk of illness and early death [34-37]. In addition, fitness can lead to enhanced cognitive functioning and can enhance one's ability to participate in leisure, often a satisfying social experience. However, both health

Table 2
Correlation matrix of Physical Fitness and HRQoL and Subscales

HRQoL / *Physical Fitness*	*PF*	*RP*	*RE*	*VT*	*MH*	*SF*	*BP*	*GH*	*HRQoL*
BMI	0.035	0.052	-0.01	0.069	0.023	0.078	0.075	0.053	0.083
	P=0.627	P=0.461	P=0.886	P=0.334	P=0.744	P=0.27	P=0.294	P=0.456	P=0.245
	-0.13	-0.08	0.014	.142*	0.052	.155*	-0.027	0.015	0.021
Right Hand Strength	P=0.077	P=0.289	P=0.839	P=0.044	P=0.465	P=0.028	P=0.704	P=0.836	P=0.772
	-0.08	-0.08	0.016	.162*	0.101	0.097	-0.057	0.025	0.034
Left Hand Strength	P=0.249	P=0.254	P=0.824	P=0.022	P=0.154	P=0.173	P=0.424	P=0.727	P=0.637
Flexibility	0.028	0.003	0.113	0.091	0.018	.143*	-0.045	0.121	0.078
	P=0.696	P=0.962	P=0.11	P=0.201	P=0.797	P=0.044	P=0.522	P=0.087	P=0.271
Sit up-0.1	-0.06	-0.04	0.096	-0.093	0.061	-0.137	0.034	-0.032	
	P=0.155	P=0.382	P=0.619	P=0.176	P=0.192	P=0.388	P=0.054	P=0.628	P=0.656
Vo_2max	0.057	-0.01	0.134	.160*	0.026	0.044	0.027	-0.06	0.084
	P=0.423	P=0.871	P=0.058	P=0.023	P=0.715	P=0.536	P=0.702	P=0.425	P=0.239
Physical Fitness**	-0.05	-0.05	0.062	.192**	0.034	.155*	-0.044	0.051	0.071
	P=0.478	P=0.513	P=0.383	P=0.006	P=0.631	P=0.029	P=0.538	P=0.471	P=0.316

*Significant at $p < .05$

and wellness are much broader terms than physical fitness. Poor health can occur even in highly fit people because of factors beyond personal control such as hereditary conditions or conditions caused by bacterial/viral infections.

The greatest limitation of our study was its cross-sectional design, which prevented us from establishing causality or directionality. Although we found positive relationships between PF and some domains of, we cannot state that physical fitness causes good social functioning and high vitality, because it is equally possible that physical fitness is the effect of good these domains of HRQoL, as people with good HRQoL may simply be more likely to be active. Quality of life is an important dimension of health, it is a subjective term which varies from person to person and depends on each individual's capacity to cope with a situation. Quality of life can be defined as a person's sense of well-being, which is based on his/her satisfaction from the areas of life that is important for him/her [9]. It is a variable, which is closely related to development. Development includes social, economic and cultural changes. It is not only related to human beings physical needs but also to the progress of social condition of his life, which leads to improvement of quality of life in people. The World Health Organization Quality of Life (WHOQOL) Group defined it as "individuals' perceptions of their position in life in the context of this culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" [38, 39]. It is a broad ranging concept affected in a complex way by: the person's physical health, psychological state, level of independence, social relationships and relationship to salient features of their environment. It is a multidimensional concept referred to as one's sense of being and/or the quality of life of that individual. It is an abstract term which is the sum total of the effects of intrapersonal and interpersonal factors acting on the individual and as it is clear this study has done among Indian female student society with especial satiation of its society.

Future research should aim exactly to clarify this issue in Indian female society. Furthermore, to assertion these results and explore whether HRQoL is a mediator of physical fitness behavior or inverse is also suggested for further study.

Compliance with Ethical Standards

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Conflict of Interest: Zahra Hojabrnia declares that she has no conflict of interest. S. S. Hasrani declares that he has no conflict of interest and Abdollah Hozhabrnia declares that he has no conflict of interest.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

This article does not contain any studies with animals performed by any of the authors.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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