

Examining the Relationship Between Physical Fitness, Emotional Intelligence and Health Related Quality of Life among Female University Students in India

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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, emotional intelligence 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 (Mean = 20.9, \pm 1.8). They were assessed utilizing PF measurement, and two questionnaires including the Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF) and the Medical Outcomes Study 36-item Short-Form Health Survey (MOS SF-36). All data collected were assessed by using Pearson Bivariate Correlations. Statistical significance was conferred at $P = 0.05$. All statistical analysis was accomplished using SPSS (v 16). The results of this research showed that there are positive significant relationships between PF, “energy/ fatigue” and “social function”. There are also significant relationships between EI and most components of HRQoL ($p < 0.05$). Thus, present research reinforced and implemented the importance of increasing physical fitness and the skills of emotional intelligence for better Health Related Quality of Life.

Keywords: Physical Fitness, Emotional Intelligence, Health Related Quality of Life, Female Student.

1. 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 (Corbin, 1997).

Physical fitness is associated with a person's ability to work effectively, enjoy

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leisure time, be healthy, resist hypokinetic diseases, and meet emergency situations. It is related to, but different from, health and wellness. Although the development of physical fitness is the result of many things, optimal physical fitness 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 (Sundblad et al. 2008; Pedersen & Saltin 2006; Brosnahan et al. 2004; World Health Organization [WHO] 2004). While PA is a pivotal factor on physical fitness (Chu & Huang 2005), Nieman (1998) indicated that low fitness level has become the most important indicator of all the risk factors for premature death.

Some researchers addressed the impact of PA on perceived health in students and found that persons attaining recommended PA guidelines were more likely to have better overall HRQL and perceived health status (Sundblad et al. 2008; Zahran et al. 2007; Brown et al. 2003). The PA levels of college students are currently below the levels thought to be sufficient to promote health benefits (Sundblad et al. 2008; Biddle & Chatzisarantis 1999).

A systematic review has reported a consistent association of higher health-related quality of life (HRQoL) scores with higher PA

levels among healthy adults (Bize et al, 2007). Physical activity has enhanced well-being and increasing physical functioning also in people with poor health (McAuley et al, 1995)

There is insufficient evidence regarding the relationship between physical fitness level and 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 (Sloan & et al. 2009).

PA also plays an important role in enhancing the emotional health of individuals. Emotions are an integral and significant aspect of human nature and the motivation for behavior. Many researchers attribute the following emotional benefits to regular PA (Hellison 2003; Leith 2002; Kerr & Kuk 2001; Baker & Brownell 2000; Biddle 2000).

There is still limited evidence on relationships of objectively measured fitness and individual domains of HRQoL and EI. Shuk-Fong Li & et al (2009) stated that there has been no study on the correlation between PA and EI; the emotional domain of PA has been overlooked in the past. Taymoori and Lubans (2008) suggested that the lack of knowledge regarding the mechanisms responsible for behavior change may explain the low levels of effectiveness in PA interventions among individuals. In a survey approach, the basic inquiries of this study will be to ascertain the

associations of PF, EI, and HRQoL. In an attempt to raise the awareness of university physical education teachers and PF professionals towards the utmost importance of the realization of the physical, psychological, and emotional domain of PF towards health and because of there is still limited evidence on relationships of objectively measured fitness, emotional intelligence and individual domains of HRQoL, the specific purposes of this study was to investigate the relationship between physical fitness, emotional intelligence and health related quality of life among female university students .

2. Methods

In a cross-sectional study, 200 female students between 17 to 27 ages (mean age = 20.9, \pm 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, Emotional Intelligence Questionnaire, and Short-form General Health Survey (SF-36; Ware 2000). 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.

3. Measuring instruments

Trait Emotional Intelligence Questionnaire – Short Form (TEIQue-SF), Medical Outcomes Study (MOS) SF-36 (Ware 2000) and PF tests were utilized in this study.

3.1. 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 PF scores were obtained, each of the measured fitness scores were converted into standardized z scores by using the formula: $X-M$ divided by $SE (SD/\sqrt{Z})$, 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.

3.2. 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 (≥ 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 (McCallum et al, 1995, Wagner et al, 1998).

In addition, SF-36 has been used as an instrument for assessing quality of life worldwide. Normative data have also been obtained in many countries (Hopman et al, 2000). 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) [Bullinger, 1995]. The SF-36 scales were scored according to published scoring procedures, each expressed with values from 0 to 100 (0 = poor health) (Ware 2000).

3.3. Emotional Intelligence

Trait emotional intelligence questionnaire–Short Form (TEIQue-SF). This is a 30-item questionnaire designed to measure global trait emotional intelligence (trait EI). The TEIQue-SF was designed to yield primarily global trait EI scores. It is based on the long form of the TEIQue (Petrides & Furnham, 2003). Two items from each of the 15 facets of the TEIQue were selected for inclusion, based primarily on their correlations with the corresponding total facet scores (Cooper & Petrides, 2010; Petrides & Furnham, 2006). TEIQue-SF provides scores on four factors of broader relevance ‘well-being,’ ‘self-control,’ ‘emotionality,’ and ‘sociability’. Items were responded to on a 7-point Likert

scale from 'Completely Disagree' (number 1) to 'Completely Agree' (number 7). The TEIQue has been constructed with the aim of providing comprehensive coverage of the trait EI domain (Petrides & Furnham, 2001).

Petrides (2008) claimed that TEIQue had overcome the limitations faced by the Bar-On EQ-I such as structure problem, inadequate coverage of the construct, lacking of safeguards against dissimulation and socially desirable responding, and scoring irregularities. In addition, TEIQue is available in multi-language with high reliability (typical Cronbach alpha > 0.80) and extensive validation evidence (Arora et al, 2011). Also on the paper of "Testing and validating the trait emotional intelligence questionnaire (TEIQue) in a German-speaking sample" by Freudenthaler et al (2008), provides conclusive evidence that the TEIQue represents a reliable and valid inventory for the comprehensive measurement of trait EI.

To obtain reliability was used test of Cronbach's alpha. In current study Cronbach's alpha coefficient for TEIQue- SF Questionnaire was %84 and for HRQOL Questionnaire was %75 so this paper provides conclusive evidence that the both questionnaire are reliable.

4. 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, emotional intelligence and health related quality of life.

5. Results

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

5.1. Physical Fitness and HRQoL

As in Table (2) is considered 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 energy, right hand strength and social functioning, left hand strength and energy, flexibility and social functioning, vo2max and energy, respectively. Also this result showed that between physical fitness in general and energy/fatigue and also social functioning there are positive significant ($P < 0.05$).

5.2. Physical fitness and EI

In this portion the results showed that a significant correlation between flexibility and Self-control there was. $P < 0.05$ (table 3).

5.3. HRQoL and EI

The results of relationship between HRQoL and EI showed that there were very strong correlations between all dimensions of HRQoL with EI factors. As is showed in Table 4 a positive significant relationship were between PF and WB, RLPH and EI, RLPH and WB, RLEP and all factors of EI, Energy and all factors of EI, EWB and all factors of EI. GH and all factors of EI and also HRQoL with WB, SC,

E and EI. Although these results showed a pain and WE, E and EI ($P < 0.05$). negative significant SF and S and also between

Table 1. Emotional intelligence, health-related quality of life and physical fitness (n = 200)

| Variables | Minimum | Maximum | Mean | Std. Error | Std. Deviation | Variance |
|-----------------------------|---------|---------|---------|------------|----------------|----------|
| WB* | 13.00 | 42.00 | 28.7600 | .423 | 5.98427 | 35.811 |
| SC* | 15.00 | 38.00 | 25.2100 | .323 | 4.58048 | 20.981 |
| E* | 1.00 | 5.00 | 3.0600 | .052 | .74779 | .559 |
| S* | 1.00 | 4.00 | 2.0950 | .035 | .50721 | .257 |
| EI* | 19.20 | 41.00 | 28.3815 | .308 | 4.36829 | 19.082 |
| PF** | 5.00 | 100.00 | 67.6250 | 1.825 | 25.81310 | 666.316 |
| RLPH** | .00 | 100.00 | 60.0120 | 2.580 | 36.49698 | 1.332E3 |
| RLEP** | .00 | 100.00 | 44.3525 | 2.567 | 36.31476 | 1.319E3 |
| E.F** | 20.00 | 100.00 | 58.5500 | 1.023 | 14.48088 | 209.696 |
| EWB** | 28.00 | 96.00 | 60.0400 | 1.074 | 15.20111 | 231.074 |
| SF** | .00 | 87.00 | 53.8250 | 1.494 | 21.13594 | 446.728 |
| P** | 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.Strength | 13.00 | 39.40 | 25.60 | 0.387 | 5.48 | 1.000 |
| Left.Hand.Strength | 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 |
| Vo2max | 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 |

*WB= 'Well-being,' SF='Self-control,' E= 'Emotionality,' and S='Sociability,' EI=Emotional Intelligence

**PF= Physical functioning, RLPH= Role functioning physical, RLEP= Rol functioning emotional, E.F= Energy/ fatigue, EWB= Emotional wellbeing, SF= Social functioning, P= Bodily pain, GH= General health, HRQoL= Health - related quality of life

***PF= Physical fitness

Table 2: Correlation matrix of Physical Fitness and HRQoL and Subscales

| HRQoL | | | | | | | | | |
|----------------------------|------------------|------------------|------------------|---------------------------------|-------------------|--------------------------------|-------------------|------------------|-------------------|
| Physical Fitness | PF* | RLPH* | RLEP* | E.F* | EWB* | SF* | P* | GH* | HRQoL* |
| BMI | 0.035 P=0.627 | 0.052 P=0.461 | -0.01 P=0.886 | 0.069 P=0.334 | 0.023 P=0.744 | 0.078 P=0.27 | 0.075 P=0.294 | 0.053 P=0.456 | 0.083 P=0.245 |
| Right Hand Strength | -0.13 P=0.077 | -0.08 P=0.289 | 0.014 P=0.839 | .142* P=0.044 | 0.052 P=0.465 | .155* P=0.028 | -0.027 P=0.704 | 0.015 P=0.836 | 0.021 P=0.772 |
| Left Hand Strength | -0.08 P=0.249 | -0.08 P=0.254 | 0.016 P=0.824 | .162* P=0.022 | 0.101 P=0.154 | 0.097 P=0.173 | -0.057 P=0.424 | 0.025 P=0.727 | 0.034 P=0.637 |
| Flexibility | 0.028 P=0.696 | 0.003 P=0.962 | 0.113 P=0.11 | 0.091 P=0.201 | 0.018 P=0.797 | .143* P=0.044 | -0.045 P=0.522 | 0.121 P=0.087 | 0.078 P=0.271 |
| Sit up | -0.1 P=0.155 | -0.06 P=0.382 | -0.04 P=0.619 | 0.096 P=0.176 | -0.093 P=0.192 | 0.061 P=0.388 | -0.137 P=0.054 | 0.034 P=0.628 | -0.032 P=0.656 |
| Vo2max | 0.057 P=0.423 | -0.01 P=0.871 | 0.134 P=0.058 | .160* P=0.023 | 0.026 P=0.715 | 0.044 P=0.536 | 0.027 P=0.702 | -0.06 P=0.425 | 0.084 P=0.239 |
| Physical Fitness | -0.05 P=0.478 | -0.05 P=0.513 | 0.062 P=0.383 | .192** P=0.006 | 0.034 P=0.631 | .155* P=0.029 | -0.044 P=0.538 | 0.051 P=0.471 | 0.071 P=0.316 |

*PF= Physical functioning, RLPH= Role functioning physical, RLEP= Rol functioning emotional, E.F= Energy/ fatigue, EWB= Emotional well-being, SF= Social functioning, P= Bodily pain, GH= General health, HRQoL= Health - related quality of life

Table 3: Correlation matrix of Physical Fitness and EI and Subscales

| | WB* | SC* | E* | S* | EI* |
|----------------------------|-------------------|--------------------------------|-------------------|-------------------|------------------|
| BMI | -0.012 P=0.867 | 0.056 P=0.419 | -0.027 P=0.709 | 0.038 P=0.598 | 0.030 P=0.678 |
| Right Hand Strength | -0.016 P=0.814 | 0.131 P=0.064 | -0.008 P=0.905 | 0.033 P=0.638 | 0.042 P=0.553 |
| Left Hand Strength | 0.020 P=0.775 | 0.122 P=0.083 | 0.026 P=0.706 | 0.0811 P=0.206 | 0.084 P=0.237 |
| Flexibility | 0.047 P=0.504 | 0.159 P=0.023 | 0.022 P=0.752 | 0.101 P=0.154 | 0.113 P=0.111 |

| | | | | | |
|-------------------------|-------------------|-------------------|-------------------|-------------------|------------------|
| Sit up | -0.025 P=0.721 | 0.065 P=0.353 | -0.094 P=0.182 | 0.020 P=0.778 | -0.029 0.682 |
| Vo2max | 0.0417 P=0.557 | -0.074 P=0.297 | 0.021 P=0.763 | 0.053 P=0.455 | 0.011 P=0.881 |
| Physical Fitness | 0.014 P=0.834 | 0.123 P=0.080 | -0.015 P=0.824 | 0.0895 P=0.207 | 0.067 P=0.347 |

*WB= 'Well-being,' SF='Self-control,' E= 'Emotionality,' and S='Sociability', EI=Emotional Intelligence

Table 4: Correlation matrix of HRQoL and EI and Subscales

| * HRQoL ** | EI | WB * | SC * | E * | S * | EIQ * |
|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------|
| PF ** | 0.231 P=0.000 | -0.029 P=0.687 | 0.078 P=0.274 | -0.054 P=0.450 | 0.098 P=0.166 | |
| RLPH ** | 0.232 P=0.000 | 0.091 P=0.199 | 0.084 P=0.239 | -0.018 P=0.803 | 0.1488 P=0.035 | |
| RLEP ** | 0.198 P=0.005 | 0.271 P=0.000 | 0.315 P=0.000 | 0.179 P=0.011 | 0.338 P=0.000 | |
| E.F ** | 0.373 P=0.000 | 0.304 P=0.000 | 0.268 P=0.000 | 0.173 P=0.014 | 0.381 P=0.000 | |
| EWB ** | 0.322 P=0.000 | 0.437 P=0.000 | 0.377 P=0.000 | 0.182 P=0.009 | 0.449 P=0.000 | |
| SF ** | -0.080 P=0.258 | -0.069 P=0.327 | -0.033 P=0.635 | -0.169 P=0.017 | -0.112 P=0.115 | |
| P ** | -0.213 P=0.002 | -0.067 P=0.349 | -0.158 P=0.025 | -0.035 P=0.626 | -0.173 P=0.014 | |
| GH ** | 0.379 P=0.000 | 0.233 P=0.000 | 0.299 P=0.000 | 0.215 P=0.002 | 0.377 P=0.000 | |
| HRQoL * | 0.359 P=0.000 | 0.288 P=0.000 | 0.286 P=0.000 | 0.121 P=0.087 | 0.367 P=0.000 | |

*WB= 'Well-being,' SF='Self-control,' E= 'Emotionality,' and S='Sociability', EI=Emotional Intelligence

**PF= Physical functioning, RLPH= Role functioning physical, RLEP= Role functioning emotional, E.F= Energy/ fatigue, EWB= Emotional well-being, SF= Social functioning, P= Bodily pain, GH= General health, HRQoL= Health - related quality of life

1. Discussion

Results of the present study showed that University female students with higher PF and some indexes were associated with more favorable scores in the social functioning and higher energy. The importance of PF was supported only that the good and satisfactory PF lead to have better social activity and with no fatigue but not high HRQoL. Our findings are not in line with some portions of Pedersen and Saltin (2006), Gladys Shuk-Fong (2009) and Brosnahan et al. (2004) studies, that PA was linked with improved psychological wellbeing, and health-related behavior.

In contrast, we found no significant correlation among physical fitness with six variables of the HRQoL, including physical functioning, Role functioning physical, Role functioning emotional, bodily pain, Emotional well-being, and General health. A possible reason for this might be that 90% of students consider themselves healthy even if they are not “feeling well” (Clausson & Berg 2003). The majority of university students might have a misconception in perceiving their health which is different from their health data examined- Sundblad et al. (2008) reported a discrepancy between how students rated their health and their reported data from their physical checkup. Also this finding was in line with some other studies that did not find a significant relationship between BMI and HRQoL (Kruger et al, 2002 and Häkkinen et al, 2010). These confounding results of different studies may be partly explained by differences in the gender, sample

size, age, and range of BMI of the participants. Furthermore, it is possible for a healthy, well-trained muscular individual with very low body fat to be classified as obese using the BMI formula. However, higher body fatness and lower physical fitness has reported to be associated with metabolic risk factors even in late adolescent college students thus increasing the risk of chronic diseases later in life (Sacheck, et al, 2009).

Although EI is an important indicator of future success in many aspects of life (BarOn 2002; Saarni 1999; Goleman 1995) and the emotional domain of PA has been overlooked in the past. But in this study, it was not found that better total EI score and composite subscale scores for Well-being, Emotionality and Sociability are significant with physical fitness. Finding only emphasized that better flexibility is positive significant correlation with Self-control which is not consistent with the finding from previous studies that PA has benefits on an individual's sense of self-worth, and self-perception (Asci 2003; Fox 2000). Also was not in line with the study of Smith (2000), who concluded that the more time a college student spent in PA, the higher their scores for empathy, interpersonal relationship and social responsibility (domains of EI), This inconsistent may be related that previous studies inquired the beneficial of physical activity on emotional intelligence most with Bar-On Questionnaire (2002) but in current study TEIQue (Petrides, & Furnham, 2001) is applied that that has

differences in domains and as Petrides (2008) claimed, TEIQue had overcome the limitations faced by the Bar-On EQ-I such as structure problem, inadequate coverage of the construct, lacking of safeguards against dissimulation and socially desirable responding, and scoring irregularities.

Health related quality of life strongly associated with EI that show persons with high emotional intelligence have better quality of life. Also subscales of health related quality of life were strongly associated with more domains of EI which was in line with the finding portions of Schutte et al. (2007) who indicated that EI had a significantly strong association with mental health.

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 HRQoL and EI, we cannot state that PF causes good domains of HRQoL and EI, because it is equally possible that PF is the effect of good domains of HRQoL and EI, as people with good EI or HRQoL may simply be more likely to be active. Future research should aim to clarify this issue. Furthermore, to explore whether EI is a mediator of PF behavior is also suggested for further study.

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