

**INTERACTION OF PHYSICAL ACTIVITY, DIET, HEALTH LOCUS OF CONTROL
AND QUALITY OF LIFE AMONG FINNISH UNIVERSITY STUDENTS**

Muhammad Tayyab Minhas

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ABSTRACT

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Literature shows that particular lifestyle modifiable behaviours, like physical activity, diet, are risk factors for the development of many diseases in adulthood. These behaviours are affected by personal psychological characteristics, like health locus of control and at the same time they affect peoples' perceived quality of life. Transition to university is an important phase in a student's life. Students' environment and social network change during this phase of life and they get more independence from their parents. Moreover, they face more stress of their studies during this period. All these factors have strong influence on their health behaviours. Ultimately, these health behaviours transformed into their life patterns. Purpose of this study was to investigate the contribution of physical activity, diet and health locus of control variables on Finnish university students' quality of life.

Data were collected from the students of University of Jyväskylä ($N=271$, $male=105$, $female=166$). In addition to demographics, multidimensional health locus of control, quality of life, self-reported physical activity and dietary habits questionnaires were used to collect data.

Results of ANOVA revealed that the mean score of male students performing vigorous activity was higher ($M = 527.92$, $SD = 1490.5$) than female students ($M = 231.01$, $SD = 219.33$) and female students consumed fruits and vegetables more than male students. Regression analyses showed that consumption of fruits and vegetables and chance locus of control contributed to the students' quality of life and mental health scores. Moreover, physical activity, consumption of fruits and vegetables and chance locus of control significantly contributed to students' physical health scores.

Longitudinal studies are required to explore the relationship between healthy and unhealthy behaviours. Intervention studies are also suggested to improve health-related behaviours and quality of life among Finnish university students.

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1 INTRODUCTION

The late adolescence period of life is important because at this stage of life, the adolescents are independent in choosing their lifestyles and different habits which will affect their whole life. They are legally allowed to take part in the activities which were prohibited previously. So, they have more chances to develop unhealthy health-related behaviours (Telama, Yang, Viikari, Valimaki, Wanne, and Raitakari, 2005; Anderssen, Wold, Torsheim 2005). Transition to university is an important phase in a student's life. Students' environment and social network change during this phase of life and they get more independence from parents. All these factors have strong influence on their health behaviours (Borsari, 2007). Ultimately, these health-related behaviours transformed into their life patterns (Skemiene, 2007).

In any society, university students represent most of the youth, it looks good to concentrate on them to find out interaction between health-related behaviours (Leslie, Owen, Salmon, Bauman, Sallis and Kai, 1999). Moreover, students consist of identical and easily approachable population which is comparatively healthier than general population. This will also reduce the bias of illness which can affect health behaviours (Steptoe & Wardle, 2001). Health-related behaviours (diet, physical activity, mental health and physical health) adapted in the early years of life have effects on the development of lifestyle related disorders in adulthood. Therefore, it is significant to explore the interaction of diet, physical activity (PA) and multidimensional health locus of control (MHLOC) with mental health and physical health (quality of life) among youth. Description of these variables has been discussed in the following paragraphs.

1.1 Physical activity

Caspersen, Powell and Christenson (1985) defined physical activity as "any bodily movement produced by skeletal muscles that result in energy expenditure" (p. 126). This is a broad definition which also includes different activities like occupational activities, household work and sports activities. However, these basic physical activities are different from the physical activity with the expenditure of energy (Tudor-Locke & Myers, 2001). There are recommended guidelines for vigorous and moderate physical activities. According to recommendations, vigorous physical activity should be performed for 20 minutes for three times a week and moderate physical activity should be

performed for 30 minutes for five times a week. Both these recommendations are for the adults between the age range of 18-56 years (Haskell, Lee, Pate, 2007).

Regular physical activity plays an important role in healthy lifestyle and it also improves physical and mental health. Higher physical activity has been linked with lower risk of developing type 2 diabetes mellitus, cardiovascular diseases, cancer, obesity, hypertension, depression and osteoporosis (Abu-Omar & Rutten, 2008; Jurakic, 2008). Physically inactive lifestyles have been verified as risk factors for health among all age groups, genders, socioeconomic groups and ethnicities (Van Der Horst, Paw, Twisk, & Van Mechelen, 2007). Peoples' engagement in active standard of living is a complex behavioural process and different factors affect it e.g. social, personal and environmental factors (Pan, Cameron, Desmeules, Morrison, Craig & Jiang, 2009).

Population-attributable risk estimates say that around 20% of premature mortality can be reduced by performing regular physical activity (CDC, 1996). At least 85% of the adults of Canadian population were not active according to recommended criteria i.e. 150 minutes moderate to vigorous physical activity in one week (Katzmarzyk, 2000). It is important to develop physically active behaviours to avoid major health risks and improve general well-being (Blair, Kohl, Gordon, & Paffenbarger, 1992). Aarnio, Winter, Kujala and Kaprio (2002) showed persistent physical inactivity among adolescents was associated with less healthy lifestyles, poor educational progress and poor self-perceived health. House (2002) showed that gender was a vital physical activity determinant as males were generally more active than females. Various studies showed that physical activity level decreased significantly between adolescence and adulthood. It may be due to the fact that physical activities become volunteer when an individual leaves the school or attends university or starts job (Bauer, Nelson, Boutelle, & Neumark-Sztainer, 2008; Li, Treuth, Wang, 2009; Molina-Garcia, Castillo, & Pablos, 2009).

1.2 Health locus of control

Locus of control is a psychological term which reflects the overall expectations of an individual about internal reinforcement versus external reinforcement (Rotter, 1966). The individuals who have firm believe that what happens in in their lives comes primarily due to their own actions belong to category called as internal locus of control. Those who have firm belief that what

happens in their lives comes primarily due to some external factors rather than internal factors belong to category calls as external locus of control. Other people, luck or fate can also be external factors (Gats & Karel, 1993). Locus of control turns into health locus of control when it comes under the roof of health. Individuals with internal locus of control think that they control their own health. On the other hand, those individuals who think that their health will be good due to care of medical professionals or due to luck or fate belong to external locus of control (Wallston, Wallston & DeVelis, 1978; Wallston, 2005). It is shown by health locus of control theory that internal locus of control is associated with healthy behaviours. On the other hand, chance locus of control is associated with unhealthy behaviours (Wallston, 1992; Norman, Bennet, 1996; Reich, Erdal, Zautra, 1997). There are three subscales on health locus of control instrument i.e. internal locus of control, chance locus of control and powerful other locus of control (Wallston, 1992; Wallston, Wallston & DeVellis, 1978).

Literature does not show consistent evidences suggested by health locus of control theory. Generally speaking, studies with large sample size have shown the suggested association (Bennett, Norman, Murphy, Moore, & Tudor-Smith, 1988; Bennett, Norman, Moore, Murphy, Tudor-Smith, 1997; Calnan, 1989; Bennett, Moore, Smith, Murphy, Smith, 1994) while studies with small sample size have not shown the expected association (Callaghan, 1998; Roddenberry, Renk, 2010) of locus of control with mental health and physical activity.

University students have special interest to control their health behaviours and feel more freedom to make their personal choices regarding their health behaviours before and after university life (Steptoe & Wardle, 2001; Arnett, 2000; Arnett, 2005). Unlike school children, university students do not depend on their parents and at the same time do not have responsibilities of their own families. In this period of life, students try to find different directions of their lives and different lifestyles (Steptoe & Wardle, 2001).

1.3 Dietary behaviours

Poor eating habit is a main public health problem among the young adults who are making transition from college life into university life (Nelson, Story, Larson, Neumark-Sztainer & Lytle, 2008). During this transition, they depict lack of time and stress (Rubina, Shoukat, Raza, Shiekh, Rashid, Siddique, Panju, Raza, Chaudhry & Kadir, 2009; Webb, Ashton, Kelly &

Kamah, 1998). The issues like poor eating habits put hindrance in accepting healthy behaviours (Nelson, Story, Larson, Neumark-Sztainer & Lytle, 2008). Unhealthy habits adopted during the university life are temporary but they can usually stick it out in older life (Silliman, Rodas-Fortier & Neyman, 2004). Nutritionally, young adults are vulnerable to bad eating habits mainly due to quick changes in physical and mental development. As a result, they are unable to fulfill dietary requirements (Chin & Mohd, 2009; Savige, Ball, Worsley & Crawford, 2007; Shi, Lien, Kumar & Holmboe-Ottesen, 2005). Meal skipping, snacks and fast food consumption and eating in restaurants are among few common eating habits which are not healthy (Savige, Ball, Worsley & Crawford, 2007; Shi, Lien, Kumar & Holmboe-Ottesen, 2005). Various previous studies showed that university students were unable to fulfill the recommended intakes of fruits and vegetables (Moy, Johari, Ismail, Mahad, Tie & Wan Ismail, 2009; Huang, Harries, Lee, Nazir, Born & Kaur, 2003). Gan, Mohd, Zalilah & Hazizi (2011) demonstrated the presence of inadequate nutrient intake and unhealthy eating habits among university students. It was concluded that healthy eating behaviours among university students should be promoted to get adequate nutrients for the life.

1.4 Quality of life

Health-related quality of life (HRQoL) is a difficult multidimensional concept which denotes self-perception of health (Ware, Snow, Kosinski, Gandek, 1993). It is considered as an effective indicator of generalized health condition (Gold, Franks, & Erickson, 1996). Moreover, various longitudinal studies have demonstrated that higher HRQoL is related to lower mortality risk (Kaplan, Berthelot, Feeny, McFarland, Khan, & Orpana 2007; Mossey & Shapiro, 1982).

Improved HRQoL is important for common and creative functions of a person. Many studies have shown the importance of assessment of HRQoL among different groups of people including university students, over the period of years. University life is a major transition in life which can cause a stressful period and can result in lower HRQoL level. There are many pressures on university students like being away from home, peer pressure, financial concerns and pressure in relationships etc. (Hamaideh, 2011). There are also few more stressors being faced associated with academic and social requirements, changes in lifestyle and living environment (Baumann, Ionescu, & Chau 2011). These are considered as specific determinants of quality of life of the

students (Sirgey, Lee, Grzeskowiak, Yu, Webb, El-Hasan, 2010). They can affect students' quality of life particularly in terms of mental health (Baumann, Ionescu, & Chau 2011).

During the recent years, globalization has increased as lots of students are moving from one country to another country (e.g. Asian to western). International students face cultural differences, adaptation, language barriers, racial discrimination, differences in education system, home sickness, and cultural differences in male-female relationships and financial difficulties which can increase the amount of stress substantially (Barletta, 2007). There are a number of factors which affect HRQoL. Various HRQoL studies performed in different universities have association with health, social and emotional variables. It is obvious from literature that HRQoL is associated with stress (Marshall, Allison, Nykamp, & Lanke 2008), social phobia (Ghaedi, Tavoli, Bakhtiari, Melyani, & Sahragard 2010), personality trait (Chu-Hsin, Li-Yueh, & Man-Ling 2007), depression (Pekmezovic, Popovic, Tepavcevic, Gazibara, & Paunic 2011), generalized soft tissues rheumatic conditions (Eyigor, Ozdedeli, Durmaz, 2008), asthma (Adler, Raju, Beveridge, Wang, Zhu, & Zimmermann 2008), iron deficiency (Grondin, Ruivard, Perreve, Derumeaux-Burel, Perthus, Roblin, Thiollieres, & Gerbaud, 2008), upper respiratory tract infection (Teul, Baran, & Zbislawski, 2008) and eating disorders (Doll, Petersen, & Stewart-Brown, 2005).

1.5 Relationships between physical activity, health locus of control and quality of life

Health locus of control theory proposes that internal locus of control is related to healthy behaviours as compared to chance locus of control and powerful others locus of control (Wallston, 1992; Norman & Bennett, 1996; Reich, Erdal & Zautra, 1997). However, literature showed inconsistencies in findings proposed by health locus of control theory. Generally speaking, studies with large samples obtained the expected results while studies with small sample sizes did not have the expected results (Callaghan, 1998; Roddenberry & Renk, 2010). Within its dimensions, locus of control has higher relationship with unhealthy diets (Steptoe & Wardle, 2001) than physical activity (Calnan, 1989; Cotter & Lachman, 2010).

Physical activity plays an integral role in the development of healthy lifestyles and it has many mental and physical benefits. Risks of mortality, cancer, cardiovascular diseases, hypertension, type diabetes mellitus and depression have inverse relationship with physical activity (Abu-Omar

& Rutten, 2008; Jurakic, 2008). Helmer, Kramer & Mikolajczyk (2012) found that higher internal locus of control was related with higher healthy diet and higher physical activity. Higher chance locus of control had relationship with decreased devotion towards healthy nutrition consumption and decreased physical activity. Higher powerful others locus of control was associated with low physical activity and no devotion towards healthy nutrition consumption.

1.6 Relationships between diet/nutrition health locus of control and quality of life

Dietary behaviours are the main characteristics of an individual's lifestyle which has effects on health, mortality, morbidity and many health conditions. So, food consumption habits in relation to mental health have received focus in research (Christensen & Pettijohn, 2001). Few studies have examined the consequences of carbohydrate consumption on mood (Benton, 2002; Benton & Donohoe, 1999; Prasad, 1998). Association between stress and food selection have been discussed in many studies (Oliver & Wardle, 1999; Weidner, Kohlmann, Dotzauer & Burns, 1996). Relationship between stress and food selection proves that during the period of stress, people experience and report overeating which they normally do not do (Zellner, Loaiza, Gonzalez, Pita, Morales, Pecora, Wolf, 2006). In US, adults reported that dietary patterns were associated with stress or depression for 10 days or more during the past months in both genders (Brooks, Harris, Thrall & Woods, 2002). Weight gain among college going women has a negative relationship with eating vegetables, using low cholesterol foods and being stressed free (Adams & Rini, 2007).

Holder & Levi (1988) described that college students higher on external locus of control (chance and powerful others) showed higher score on The Symptom Checklist-90-R (SCL-90-R).

Horner, (1996) found that external locus of control (chance and powerful other) had relationship with higher level of actual stress and perceived stress. Moreover, locus of control, stress and neuroticism were the predictors of illness. Roddenberry & Renk (2010) demonstrated that psychological symptoms were significantly and positively associated with health related external locus of control (chance and powerful others).

To the best of our knowledge, so far, no study has been conducted on the relationship of physical activity, consumption of fruits and vegetables, health locus of control and quality of life (physical and mental wellbeing) among Finnish university students. As mentioned above, major

portion of youth consists of university students in any society, so it is important to explore interaction of these variables among them.

2 LITERATURE REVIEW

Literature shows that particular health-related behaviours (physical activity, dietary habits, locus of control and quality of life) are risk factors for the development of many diseases in adulthood. The late adolescence period of life is important because at this stage of life, the adolescents are independent in choosing their lifestyles and different habits which will affect their whole life. So, they have more chances to develop unhealthy health-related behaviors (Telama, Yang, Viikari, Valimaki, Wanne, and Raitakari, 2005; Anderssen, Wold, Torsheim, 2005).

2.1 Physical activity and health-related behaviours

Vuori, Kannas, Villberg, Ojala, Tynjala and Valimaa (2012) conducted a study in Finland to explore an association between physical activity and risk of health behaviors among 15 years old students. Educational ambitions and family influence on their lives were also considered. The results showed that boys were more physically active than girls. As far as ambitions of education were concerned, girls were commonly considered as having higher education than the boys. A strong correlation was found between smoking and other risk behaviors and a weak correlation was found between physical activity measures and risk behaviors. It was also found that physical activity was not strongly correlated with low risk health behaviors. Here, these low risk health behaviors have not been explained.

To investigate the relationship between leisure-time physical activities and health-related behaviors (dietary habits, and smoking habits etc.), social relationships and health status in late adolescence over a three-year time period, Aarnio, Winter, Kujala and Kaprio (2002) carried out a study in Finland. Questionnaires were sent to the study participants (twins) on their 16th and 17th birthdays and after 6 months of their 18th birthday. In both genders, taking breakfast irregularly, smoking, studying in vocational schools and poor self-perceived health was strongly associated with persistent inactivity. Results showed that persistent physical inactivity in adolescent had a relationship with less healthy life style, bad educational progress and poor self-perceived health. The results of the study emphasized the needs of designing plans and policies to improve healthy habits among the adolescents. This study showed that boys were more persistent in performing exercise than girls while both were identical in health related behaviors regarding exercise persistency. Sallis, Zakarian, Hovell, Hofstetter, 1996; Riddoch, Savage,

Murphy, Cran, Boreham, 1991 found that boys looked more active than girls; however, in another study Riddoch (1991) found that girls had healthier eating habits than boys.

A longitudinal cohort study was completed in Canada by Kwan, Cairney, Faulkner and Pullenayegum (2012) to distinguish the methods of physical activity based on gender and educational level in a sample representative of Canadian adolescents. They got data about binge drinking, smoking, education level and demographics. Results showed that there was by and large (24%) decrease in physical activity during the period of 12 years. A remarkable decrease in physical activity was observed during the transition of young adults into early adulthood. This decline was clear among male who started college or university. There was an increase in many health risk behaviours during the adolescence however; smoking and binge drinking decreased gradually after their maturity.

To establish the prevalence of tobacco use among university students participating in different sports, a cross-sectional research was accomplished by Nerin, Crucelaegui, Novella, Cajal, Sobradie and Gerico (2004). They collected data on age, sex, tobacco use, cigarettes per day, history of physical activities before the start of tobacco use, awareness of rules and regulations regarding smoking within university campus, their views about relationships between tobacco use and decreased physical activity and their wish to quit tobacco use. It was found that physical exercise in adolescence when used as a preventive program, served as an obstacle to start smoking. The information regarding the questionnaires which they used was not provided. It was also not mentioned whether it was a standardized questionnaire or not.

2.2 Dietary habits and health-related behaviours

Abolfotouh, Bassiouni, Mounir and Fayyad (2007) examined health-related lifestyle and their determinants among the students residing in university hostels in Egypt. Data were collected from 600 university students living in hostels. The major variables of the study were perceived health status, social support, unhealthy dietary behaviors, physical activity behaviors, smoking, sleep behaviors and specific harmful behaviors. Female students were reported to be deficient in physical activity as compared to male students. This might be due to socio-cultural fact that female students had fewer opportunities to go out from hostel for physical activities. Like previous studies, this study showed a strong association with family history of smoking

(Johnson, Li, Perry, Elder, Feldman, Kelder, Stone, 2002), sedentary lifestyle and overweight (Bakr, Ismail, Mahaba, 2002; Al Rukban, 2003). On the other hand, studies also showed an association between improved physical activity and academic show (Valois, Zullig, Huebner, Drane, 2004); however, this study could not prove this association.

In Saudi Arabia, Al-Hazza, Abahussain, Al-Sobayel, Qahwaji and Musaiger (2011) observed the prevalence of physical activity, sedentary behaviors and dietary habits in adolescents from 14-19 year age to determine the association among these factors. They collected sample (2908) of adolescent male and female students from secondary schools of three major cities of Saudi Arabia. Results showed that a high percentage (84% male and 91% female) of the students spent more than 2 hours in front of screen daily. Almost half of the males and two third of the females were not physically active according to the physical activity guidelines. Most of them did not take daily breakfast, vegetables, fruits and milk. Physical activity was significantly positively associated with fruits and vegetables intake but not with sedentary lifestyle. It was concluded that sedentary behaviors, physical inactivity and dietary habits were highly prevalent among Saudi secondary school adolescents. Main focus of this study was on the frequency of food intake, not the quantity.

The purpose of the study carried out by Kasmel, Helasoja, Lipand, Prattala, Klumbiene and Pudule (2004) was to look at the association of particular health related behaviors (taking fresh vegetables fewer than three days per week, leisure time physical activity less than two or three times per week, daily smoking habits, regular strong alcohol consumption) in Estonia, Finland, Latvia and Lithuania. Results showed that Finnish men and women had reported their health conditions better as compared to all Baltic countries. In Finland and Latvia, one third of the respondents used vegetables fewer than 3 days per week but this count reached up to 50% in Estonia and Lithuania. In Estonia, Latvia and Lithuania, physical activities were found to be less prevalent as compared to Finland. Significant differences were found in self-rated health assessment among these countries. It might be due to the reason that health self-assessment was not understood similarly among different cultures. The “average” health reported in Baltic countries might be due to their psycho-social reasons. Fylkesnes and Forde (1991), Putnam, Leonadi, & Nanetti (1993), Jylhä, Leskinen, Alanen, Leskinen, Heikkinen (1986) and Bobak,

Pikhart, Hertzman, Rose & Marmot (1998) supported this argument. They showed that locus of control and social networks etc. might shape self-assess health.

Gender differences in students' health habits and their motivation towards healthy lifestyles were investigated by Margareta and Fridlund (2005) in a cross-sectional study among university students in Sweden. A self-rated questionnaire was used to collect data in this descriptive comparative study. They showed positive behaviours related to alcohol consumption and smoking but poor behaviours towards dietary patterns. Alcohol consumption level in this research was far below as reported by Gill (2002). Happiness and pleasure were the main reasons for alcohol consumption in UK (Webb, Ashton, Kelly, and Kamali, 1996), however, 'making it easier to socialize' was the main reason for alcohol consumption in this study. This might be due to cultural differences.

2.3 Multidimensional health locus of control and health-related behaviours

A descriptive cross-sectional study was carried out by Karayurt and Dicle (2008) to investigate the relationship between locus of control and mental health status among nursing students studying in their bachelors in Turkey. Two scales were used in this study; the locus of control and the general health questionnaire-12. A significant, positive, moderate relationship was found between LOC and GHQ-12 which showed that an increase of general health score would result in an increased score of internal locus of control. A significant difference in the mean general health score was found among different level students. Lower internal LOC score was found among first year and second year students which showed that these students were at higher risk of developing mental problems when compared to third year and fourth year students. Only internal locus of control and mental health had been given the emphasis in this study. However, the relationship between external locus of control and chance locus of control had not been discussed. As the data had already been collected about external and chance locus of control, it should be analyzed which might give few more interesting results.

To evaluate the association between different dimensions of HLOC and health behaviors in a homogeneous sample of university students, Helmer, Kramer and Mikolajczyk (2012) completed a study in Germany. It was assumed that students with more internal LOC would show more health behaviours as compared to those who had chance LOC. It was also assumed that more

score on powerful others would be associated with health behaviors like smoking and more alcohol consumption etc. It was found that among three different dimensions, internal LOC had the highest score and chance LOC and powerful LOC had lower but almost equal scores.

Adolfsson, Andersson, Elofsson, Roessner and Unden (2005), found a relationship between internal LOC and weight of students but this study could not find any association between these variables.

Bagherian, Ahmadzadeh, & Baghbanian (2009) performed a cross-sectional study to investigate the association between locus of control and psychological problems (mental health) among university students in Iran. Data were collected from 134 students by using HLOC questionnaire. A significant positive correlation was found between powerful others locus of control and depression, anxiety, phobic anxiety paranoid ideation and somatization and between chance locus of control and obsessive compulsive, depression and somatization scores. Most of the participants with higher internal locus of control belonged to those families who focused education, effort and responsibility. Opposite to this, the students' higher external locus of control was due to their past experiences and cultural beliefs (Rotter, 1966: Slander, Marnetoft, Akerstrom & Asplund, 2005). This study was conducted among students who were suffering from major psychiatric disorders and had serious medical issues. The results might be different from the results obtained in a normal and healthy students' study. Moreover, the sample size of this study was also too small to have a solid conclusion.

Biddle and Asari (2011) used seven different databases i.e. PubMed, PsychINFO, SPORTDiscus, Web of Science, Medline, Cochrane Library and ISI Science Citation Index for a meta-analysis to investigate the relationship among physical activity, anxiety, depression, cognitive functioning and self-esteem in children and adolescents. They found 11 articles and out of these articles, five showed relationship between physical activity and depression, four showed relationship between physical activity and anxiety and two were on different mental issues. The results showed an apparent effect of physical activity on mental health. However, this could not be confirmed due to small effect size. Further research on the association of physical activity and mental health had been suggested by the authors like others (Jones & Beney, 2004).

Strohle (2009) found that there were many methodological limitations in the published studies. So, he critically reviewed all available literature on: 1) relationship of physical activity, exercise,

prevalence and incidence of anxiety and depression disorder and 2) exercise training as therapeutic activity among patients with anxiety or depression disorders. Physical activity and mental health (anxiety and depression) had been studied in many researches but only a few of them were conducted prospectively. Decreased incidence rates of anxiety and depression had been found among the patients performing exercises. It gave rise the question that whether exercises should be used to prevent mental disorders. Proofs of positive effects of physical activity and training of exercise on anxiety and depression increased but frequency, intensity and duration still require further support from the patients.

2.4 Health-related quality of life and health-related behaviours

Health-related quality of life (HRQoL) is a difficult multidimensional model which deals with overall health and self-perception (Ware et al. 1993; Gold et al. 1996). Various longitudinal studies showed a decrease in mortality rate with a high HRQoL. Rakovac, Pedisic, Pranic, Greblo & Hodak (2012) carried out a study among Croatian university students to evaluate HRQoL and its association with lifestyle characteristics and socio-demographics. They found that students scored the highest on the subscale of physical functioning and higher mean scores were also obtained on other physical health measures however; lower scores were found on mental health subscales. It was found that male students were scored higher on all subscales than females. HRQoL was significantly positively related to exercise frequency among Croatian university students.

Vaes & Laflamme (2003) investigated health behaviours and self-rated health and quality of life in a baseline study on male and female students of university in Sweden. Data were collected from only first year students who were registered in a study program offered by Swedish university in autumn 1998. Self-administered questionnaires were sent to the home addresses of the students. It was found that most of the students rated their psychological as well as physical health as good or very good. However, male students rated themselves higher as compared to female students. On the other hand, self-perceived quality of life of male and female students had powerful association with self-rated psychological health than physical health. As the data were collected from only first year, inclusion of second year student may have different results. Moreover, it was a baseline survey; an end line survey should be conducted to see the differences between a particular time periods.

2.5 Relationships between physical activity, health locus of control and quality of life

It is believed that physical activity has strong and causal relationship with a large number of health benefits (Barnett, Gauvin, Craig & Katzmarzyk, 2007). Hamer & Stamatakis (2010) developed hypothesis that physical activity and fitness would be associated with self-rated health and psychological wellbeing in the adult population of UK. They found that men were performing moderate to vigorous activities more than the women but there were no significant differences in light physical activities. Study participants who were performing highest moderate to vigorous physical activity had lesser risk of describing poor health as compared to those who were performing lowest moderate to vigorous physical activities. Moreover, they could not find any relationship between objectively evaluated physical activities/fitness with psychological stress. However, when compared the individuals who were performing in the highest tertile of moderate to vigorous physical activity with those who were performing in the lowest tertile of moderate to vigorous physical activity, the individuals with highest tertile reported lower psychological distress than lowest tertile. It was concluded that moderate to vigorous physical activity was associated with self-rated health. It was also determined that only self-reported physical activity had relationship with psychological health. However, the association between self-reported health and moderate to vigorous physical activity could not be found.

The objectives of the study completed by El-Eisa & Al-Sobayel (2012) were to quantify physical activity level and to examine the association between psychological factors and physical activity level among Saudi female university students and workers. Participants had higher internal locus of control than external locus of control. Chance locus of control was found to be lower particularly. They counted steps to measure physical activity and found that step count and self-efficacy were strongly associated. A mild correlation was found between step count and internal locus of control and also mild but negative correlation with external locus of control. It was concluded that physical activity and health beliefs were correlated.

To examine the physical and mental health benefits of physical activity and exercise, a literature review was conducted by Penedo & Dahn (2005). They found that various studies showed low risk of coronary heart diseases among those who were performing moderate regular physical activity (Allen, 1996; Blair, 1994). Physical activity also reduced systolic blood pressure among type 2 diabetics which resulted in decreased diabetic complications, diabetic deaths and

myocardial infarction (Adler, Stratton & Neil, 2000). Moreover, physical activity outcomes were associated with incidence of cancer and mortality due to cancers of different parts of the body (Magnusson, Baron, Persson, Wolk, Bergstrom, Trichopoulos & Adami, 1998). Various studies were also found showing that physical activity helped to reduce symptoms of anxiety and depression. It also helped to improve moods of individuals (Ross & Hayes, 1988). An intervention of aerobic exercises was introduced among people diagnosed with major depression and results showed a remarkable progress as compared to those who were receiving psychotherapy (Babyak, Blumenthal, Herman, Khatri, Doraiswamy, Moore, Craighead & Krishnan, 2000). Emerging researches are backing the concept of 'physical activity and exercise' are related with physical and mental benefits among various diseases and different groups of population.

2.6 Relationships between diet/nutrition health locus of control and quality of life

Judy, Kim & Goebel (2005) aimed the study to examine and compare eating habits and physical activity habits among Midwestern university students (lower level and upper level). Data were collected from 114 lower level and 147 upper level students. They found that both groups (lower level and upper level) were consuming juices, milk, low calories, diet beverages, water, soda and sport beverages with the similar frequency. The percentage of college students who were meeting American College of Sport Medicine recommendation (ACSM) was same as found by George (2000) but greater than Dunn & Wang (2003). Significant differences were present between lower and upper level students for the frequency of eating from university cafeteria, walking time, performing aerobic exercises and eating snacks in the afternoon.

Porter, Johnson & Petrillo (2009) accomplished a study among South African undergraduate students to evaluate health behaviors including tobacco use, alcohol and drug use, dietary habits, physical activity, behaviors related to unintentional injuries and violence and sexual behaviors related to unintentional pregnancies and HIV/STI. They found majority of students were consuming three or more servings of fruits and vegetables in a day. As compared to older students, younger students were more significant in taking breakfast in one month before this study. It was also found that 44% of the students were performing vigorous physical activities and 38% were performing moderate physical activities. Vigorous activity was more common among white students while moderate activity was more frequently performed by black students.

Purpose of the study was to investigate the association between mental health and dietary habits among the students of three European countries. Mikolajczyk, El Ansari & Maxwell (2009) collected data from three different universities of three different countries i.e. University of Bielefeld, Germany, Catholic University of Lublin, Poland and Sofia University, Bulgaria. They found that females were consuming more sweets and cakes than males in all three countries. Moreover, consumption of fresh fruits, cooked vegetables, salad, cereals and milk products were slightly more among females than males. However, the use of lemonade, soft drinks, fish and meat was more common among males than females. Female students showed more score of perceived stress and depressive symptoms than male students. Differences in depressive symptoms were also found across these countries. Among male students, depressive symptoms or perceived stress were not associated with any type of food consumption. However, a decreased consumption of fruits and vegetables was associated with depressive symptoms and higher perceived stress. Further, a negative association was found between meat eating and depressive symptoms among females.

Health-related behaviours like physical activity, dietary habits, locus of control, quality of life, physical and mental health, etc. have been discussed in various studies explained in the literature review. Participants of these studies were taken from schools, colleges, medical colleges and universities. These variables were studied in different studies in Finland, Sweden, UK, Greece, Germany, Poland, Bulgaria, Croatia, Turkey, South Africa, Saudi Arabia, Iran, Egypt and Canada. However, author could not find even a single study which had explored the relationship of physical activity, consumption of fruits and vegetables, quality of life, physical and mental health among Finnish university students.

PURPOSE

Purpose of this study was to explore the interaction of physical activity, diet and health locus of control variables on Finnish university students' quality of life (mental and physical health).

Following assumptions are made for this study

1. Do gender affect significantly on students' physical activity behaviours?
2. Do gender affect significantly on students' dietary habits?
3. Do diet, physical activity and health locus of control variables contribute to students' quality of life?
4. Do diet, physical activity and health locus of control variables contribute to students' mental health?
5. Do diet, physical activity and health locus of control variables contribute to students' physical health?

4 METHODOLOGY

4.1 Participants

A total of 271 participants (male=105, female=166) were included in this study. All participants were students (bachelor, master or PhD) at University of Jyväskylä, Finland.

4.2 Demographics

Data regarding participants' gender, age, family status, year of university study, study subject, parents' education status and area of residence were collected in demographic section of the questionnaire.

Age range of the participants was 19-57 years ($M=25.92$). One hundred ninety two participants (71%) were studying social sciences. Majority of the participants were Finnish (218, 80%) and rest of the participants (20%) were foreigners. One hundred fifty three (56.3%) participants were doing their bachelors, 111 (40.8%) were doing their masters and 4 (1.5) were doing their PhDs. Most of the students were living in urban areas (256, 94%) and only 13 (5%) were living in rural areas.

4.3 Measures

A total of 4 questionnaires had been merged to develop one questionnaire for this study to collect data. These variables were: demographics, mental health, physical health, physical activity, locus of control and food behaviors. Lifestyle modifiable behaviours had been assessed; a) physical activity (IPAQ short version) and b) food behaviours (Townsend et al, 2003). Psychological variables had been assessed; a) quality of life index (SF-36; Ware, 1992) and b) health locus of control (MHLC: Wallston, Wallston, & DeVellis, 1978). Description of each questionnaire is given in the coming paragraphs.

4.3.1 Multidimensional Health Locus of Control (MHLC)

Multidimensional Health Locus of Control was developed by Wallston, Wallston and DeVellis in 1978. This scale is considered a standardized measure of health related locus of control. It is comprised of 18 items with three subscales. Each subscale consists of six items. Individuals with internal locus of control take responsibility of their own health while individuals with external locus of control think that their health is in the hands of health professionals or other external factors. However, there are also individuals who believe that their health depends upon their fate

(by chance) (Armitage, 2003). Therefore, these subscales are internal multidimensional health locus of control (MHLC-I: i.e. I am in control of my health), powerful others (MHLC-P: Whenever I don't feel good, I should consult a medically trained professional) and chance (MHLC-C: No matter what I do, if I am going to sick, I will get sick). A six point Likert scale from "strongly agree" to "strongly disagree" is used to explore the extent to which the participants agree or disagree with the statement. The minimum score can be obtained on three subscale is 6, maximum is 36 and the midpoint is 21 (Callaghan, 1998). Score from 23-36 on a particular subscale shows high tendency towards that subscale, score from 15-22 shows moderate and score from 6-14 shows low tendency towards the particular subscale. Reliability coefficient was reported by Bowling (1991) between 0.12-0.94 for MHLC scale.

4.3.2 Quality of life Index (SF-36)

Health-related quality of life (Ware, Kosinski, Turner-Bowker and Gandek, 2002) denotes functioning and wellbeing in mental, physical and social aspects of life. The SF-36 is a scale which consists of 36 items. It was developed to survey health status and quality of life. This questionnaire assesses 8 health concepts which are: limitations in physical activities due to health problems, limitations in social activities due to physical or emotional problems, limitations in usual role activities due to physical health problems, bodily pain; general mental health (psychological distress and well-being), limitations in usual role activities due to emotional problems, vitality (energy and fatigue), and general health perceptions. The items use Likert scale with 5 or 6 and 2 or 3 points. This scale does not specifically measure a particular disease, infact it measures general health and most of the items in this scale have been extracted from different questionnaires used in the era of seventies and eighties (Ware & Sherbourne, 1992). All the items have been scored on a scale of 0-100, 0 represents the lowest and 100 represents the highest score. The average score is computed by summing up of aggregated score on all eight subscales. The SF-36 has been using in many diseases like stroke, migraine, spinal injuries, arthritis, depression, cancer and cardiovascular diseases (Turner-Bowker, Bartley & Ware, 2002). Here are examples of the questions: "how much bodily pain has you had during the past 4 weeks?", and "how much of the time during the past 4 weeks have you felt so down in the dumps nothing could cheer you up?" The SF-36 has been used extensively and has outstanding psychometrics.

Table 1. *Subscales of SF-36 including number of items*

Scale	Number of items	Definition of scale
Physical Functioning (PF)	10 items	Limitations in physical activity because of health problems
Social Functioning (SF)	2 items	Limitations in social activities because of physical or emotional problems
Role limitations – physical (RP)	4 items	Limitations in usual role activities because of physical health problem
Bodily pain (BP)	2 items	Presence of pain and limitations due to pain
General medical health (GH)	5 items	Self-evaluation of personal health
Mental health (MH)	5 items	Psychological distress and well-being.
Role limitations – emotional (RE)	3 items	Limitations in usual role activities because of emotional problems.
Vitality (VT)	4 items	Energy and fatigue
General Health perceptions	Single item	

4.3.3 International physical activity questionnaire (IPAQ)

International physical activity questionnaire is a recall questionnaire for last 7 days. On the whole, IPAQ covers up 4 different areas to measure physical activity i.e. leisure time physical activity, domestic and gardening (yard) activities, work-related physical activity, transport-

related physical activity. The short form of the questionnaire has 7 questions and measures 4 types of physical activities; vigorous, moderate, walking and sitting activities. The last item in this questionnaire measures the duration of sitting however it is not included in results. All activities performed in hours should be converted in minutes before calculation. Activities less than 10 minutes should be deleted and the activities more than 180 minutes should be restricted to 180 minutes as it is considered as rational maximum time.

Vigorous activities include heavy lifting, digging, fast bicycling; moderate activities include carrying light loads, bicycling at regular pace; walking activities include work at home, walking from one place to other place and recreational activities; sitting activities include time spent at home, at work and leisure time. Here are few examples of the questions; “during the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?”, “during the last 7 days, on how many days did you walk for at least 10 minutes at a time?”. The short form of the questionnaire was used in this study. This form was developed for international use and had been validated in 12 countries (Craig, Marshall, Sjöström, Bauman, Booth, Ainsworth, Pratt, Ekelund, Yngve, Sallis, Oja, 2003).

4.3.4 Food behaviour checklist

Food behaviour checklist contains 22 items in five subscales: 1) fruits and vegetable subscale consists of nine items like “do you eat more than 1 kind of fruit daily?”, “do you eat low-fat instead of high fat?” 2) milk subscale consists of two items like “do you drink milk daily?” 3) fat and cholesterol subscale consists of five items like “do you take the skin off the chicken?” 4) diet quality subscale consists of four items like “when shopping, do you use nutrition facts on the food label to choose foods?” 5) food security subscale consists of two items like “do you run out of food before the end of the month?”

4.4 Procedure

Data were collected from the students of University of Jyväskylä, Finland during the autumn 2012 and spring 2013. Questionnaire had two versions i.e. English and Finnish. Finnish students chose Finnish version and foreigner students chose English version. The questionnaire was administered collectively in different classes with the permission of the class teachers and with the informed consent of students. Online versions of Finnish and English questionnaires have

also been developed in Google Doc. Questionnaire was also sent to university students through university mailing list FS News.

4.5 Data analysis

Descriptive statistics such as total number of participants, age range, gender differences, BMI, mean, standard deviation of all the variables were computed to obtain basic information about the characteristics of the sample. For statistical analysis, Statistical Package for Social Sciences (SPSS), version 20 was used. ANOVA was used to check the variance of means among different groups in relation to consumption of fruits and vegetables, vigorous physical activity and health locus of control. Regression analysis was used to check the predictability in the relationships between different variables.

5 RESULTS

5.1 Descriptive Statistics

Descriptive statistics such as total number of participants mean and standard deviation values are reported in Table 2.

5.2 Group Differences

A one-way ANOVA was conducted to explore the group differences for all behavioral and psychological variables among male and female students. ANOVA showed a significant difference in vigorous PA group $F_{(1,269)} = 6.38, p = .012$ and fruits and vegetables consuming group $F_{(1,269)} = 49.57, p = .000$. Mean scores show that male students ($M = 527.92, SD = 1490.5$) are performing vigorous PA more than female students ($M = 231.01, SD = 219.33$). However, female students ($M = 23.34, SD = 4.25$) consume fruits and vegetables more than the male students ($M = 19.80, SD = 3.66$).

Table 2. Means and standard deviations for all variables grouped by gender

		N	Mean	Std. Deviation
Physical Health	Male	105	81.23	13.92
	Female	166	81.93	11.61
	Total	271	81.66	12.53
Mental Health	Male	105	76.25	15.81
	female	166	75.93	15.31
	Total	271	76.05	15.48
Quality of life	Male	104	80.44	14.46
	female	166	81.25	12.45
	Total	270	80.94	13.24
Internal health locus of control	Male	105	23.96	3.96
	female	166	23.30	4.34
	Total	271	23.55	4.20
Powerful others health locus of control	Male	105	15.74	4.20
	female	166	15.49	4.00
	Total	271	15.59	4.07
Chance health locus of control	Male	105	16.21	4.73
	female	166	16.06	4.92
	Total	271	16.12	4.84
Vigorous physical activity	Male	105	527.92	1490.49

	female	166	231.01	219.33
	Total	271	346.05	951.90
Moderate physical activity	Male	105	1300.41	1370.74
	female	166	1023.06	1178.97
	Total	271	1130.52	1261.54
Walking physical activity	Male	105	796.08	1085.73
	female	166	884.02	1169.22
	Total	271	849.95	1136.37
Total index of physical activity	Male	105	2624.42	3125.82
	female	166	2138.09	1899.72
	Total	271	2326.52	2454.66
Fruit & vegetable	Male	105	19.80	3.66
	female	166	23.34	4.25
	Total	271	21.97	4.38
Milk	Male	105	4.99	1.25
	female	166	4.82	1.44
	Total	271	4.88	1.37
Fat and Cholesterol	Male	105	11.30	4.57
	female	166	10.42	3.74
	Total	271	10.76	4.10
Diet Quality	Male	105	11.92	1.69
	female	166	12.93	1.46
	Total	271	12.54	1.62
Food Security	Male	105	6.82	1.52
	female	166	7.25	1.15
	Total	271	7.08	1.32

5.3 Relationships

5.3.1 Contribution of physical activity, diet and health locus of control variables on quality of life

In order to investigate the relative contribution of students' health-related behaviours and health locus of control on their quality of life index, a hierarchical regression analysis was performed. Two steps were used. In the first step vigorous & moderate physical activity, walking and consumption of fruits and vegetables, milk and fat and cholesterol were entered. In the second

step, students' health locus of control (internal, powerful others and chance) were added. Students' quality of life index was the dependent variable.

Table 3. *Contribution of physical activity, diet and health locus of control variables on students' quality of life*

<i>Variables</i>	<i>R²</i>	<i>R</i>	<i>β</i>	<i>t</i>
<i>1st step</i>	<i>.057</i>	<i>.036</i>		
Vigorous PA			.11	1.66 ^{ns}
Moderate PA			.07	1.11 ^{ns}
Walking			-.02	-.40 ^{ns}
Fruits & vegetables			.18	2.94*
Milk			.07	1.14 ^{ns}
Fat & Cholesterol			-.07	-1.23 ^{ns}
<i>2nd step</i>	<i>.108</i>	<i>.329</i>		
Vigorous PA			.07	1.13 ^{ns}
Moderate PA			.10	1.61 ^{ns}
Walking			-.01	-.17 ^{ns}
Fruit & vegetable			.13	2.27*
Milk			.07	1.31 ^{ns}
Fat & cholesterol			-.07	-1.32 ^{ns}
Internal Locus of control			.01	0.17 ^{ns}
Powerful others Locus of control			-.05	-0.84 ^{ns}
Chance Locus of Control			-.21	-3.27*

*: $p < .05$, ^{ns}: non-significant

Students' health related behaviors explained 24% of the variance in quality of life, $F_{6,263} = 2.67$, $p = .016$. Significant contributors was consumption of fruits and vegetables (beta = .18, $p = .004$). In the next step 33% of the variance was explained, $F_{9,260} = 3.51$, $p = .000$. The addition of health locus of control variables explained an additional .51% (significant change) of the variance in quality of life index, R squared change = .051, F change $_{3,260} = 4.94$, $p = .002$. The strongest contributor was health locus of control – chance (beta = -.210, $p = .001$), followed by consumption of fruits and vegetables (beta = .137, $p = .024$).

5.3.2 Contribution of physical activity, diet and health locus of control variables on mental health

In order to investigate the relative contribution of students' health-related behaviours and health locus of control on their mental health, a hierarchical regression analysis was performed. Two steps were used. In the first step vigorous and moderate physical activity, walking and consumption of fruits and vegetables, milk and fat and cholesterol were entered. In the second step, students' health locus of control (internal, powerful others and chance) were added. Students' mental health was the dependent variable.

Table 4. Contribution of physical activity, diet and health locus of control variables on students' mental health

<i>Variables</i>	R^2	R	β	t
<i>1st step</i>	.054	.032		
Vigorous PA			.09	1.35 ^{ns}
Moderate PA			.050	.73 ^{ns}
Walking			.05	.87 ^{ns}
Fruits &Vegetables			.17	2.86*
Milk			.08	1.32 ^{ns}
Fat & Cholesterol			-.03	-.59 ^{ns}
<i>2nd step</i>	.078	.046		
Vigorous PA			.07	1.03 ^{ns}
Moderate PA			.07	1.07 ^{ns}
Walking			.06	1.02 ^{ns}
Fruit &Vegetable			.14	2.38*
Milk			.08	1.41 ^{ns}
Fat & Cholesterol			-.03	-.64 ^{ns}
Internal Locus of control			.01	.16 ^{ns}
Powerful others Locus of control			-.05	-.90 ^{ns}
Chance Locus of Control			-.13	-2.04*

*: $p < .05$, ^{ns}: non-significant

Students' health related behaviors explained 23.2% of the variance in mental health, $F_{6,264} = 2.49$, $p = .023$. Significant contributor was consumption of fruits and vegetables (beta = .17, $p = .005$). In the next step 28% of the variance was explained, $F_{9,261} = 2.4$, $p = .011$. The addition of health locus of control variables explained an additional 25% of the variance in mental health, R squared change = .025, F change $_{3,261} = 2.3$, $p = .076$. The strongest contributors were consumption of fruits and vegetables (beta = .146, $p = .018$), followed by health locus of control – chance (beta = -.133, $p = .042$).

5.3.3 Contribution of physical activity, diet and health locus of control variables on physical health

In order to investigate the relative contribution of students' health-related behaviours and health locus of control on their physical health, a hierarchical regression analysis was performed. Two steps were used. In the first step vigorous & moderate physical activity, walking and consumption of fruits and vegetables, milk and fat and cholesterol were entered. In the second step, students' health locus of control (internal, powerful others and chance) were added. Students' physical health was the dependent variable.

Table 5. Contribution of physical activity, diet and health locus of control variables on students' physical health

<i>Variables</i>	<i>R²</i>	<i>R</i>	<i>β</i>	<i>t</i>
<i>1st step</i>	.063	.042		
Vigorous PA			.11	1.75 ^{ns}
Moderate PA			.09	1.38 ^{ns}
Walking			-.10	-1.61 ^{ns}
Fruits &Vegetables			.17	2.88*
Milk			.06	1.03 ^{ns}
Fat & Cholesterol			-.07	-1.19 ^{ns}
<i>2nd step</i>	.131	.101		
Vigorous PA			.06	1.04 ^{ns}
Moderate PA			.12	1.99*
Walking			-.08	-1.37 ^{ns}
Fruit &Vegetable			.12	2.06*
Milk			.07	1.28 ^{ns}
Fat & Cholesterol			-.08	-1.44 ^{ns}
Internal Locus of control			.04	.78 ^{ns}
Powerful others Locus of control			-.03	-.58 ^{ns}
Chance Locus of Control			-.24	-3.86*

*: $p < .05$, ^{ns}: non-significant

Students' health related behaviors explained 25% of the variance in physical health, $F_{6,264} = 2.97$, $p = .008$. Consumption of fruits and vegetables was significant contributor (beta = .17, $p = .004$). In the next step 36.2% of the variance was explained, $F_{9,261} = 4.38$, $p = .000$. The addition of health locus of control (chance, powerful other and internal) explained an additional 68% (significant

change) of the variance in quality of life index, R squared change = .068, F change $_{3,261} = 6.82$, $p = .000$. The strongest contributor was health locus of control - chance (beta = $-.245$, $p = .000$) followed by consumption of total fruits and vegetables (beta = $.123$, $p = .040$) and moderate physical activity (beta = $.128$, $p = .048$).

6. DISCUSSION

Results of the study show that Finnish male students perform vigorous physical activity more than female students. On the other hand, female students are consuming more fruits and vegetables than male students. Fruits and vegetables and chance health locus of control are significantly contributing to students' overall quality of life. However, only moderate physical activity is contributing significantly to students' physical health.

6.1 Do gender affect significantly on students' physical activity behaviours?

First research question of the study was, "Do gender affect significantly on students' physical activity behaviours"? Findings of this study showed that male students performed vigorous physical activities more than the female students. These findings are according to previous studies (Haase, Steptoe, Sallis & Wardle, 2004; Keating, Guan, Pinero & Bridges, 2005; Crocker). In general males are considered more physically active than female (Eisenmann, Bartee, Smith, Welk & Fu, 2008; Jurakic, 2008; Lee & Loke, 2005, Li et al. 2009; Molina-Garcia, Castillo & Pablos, 2009, Eklund & Kowalski, 2000; Asci, Macide & Koca, 2006). According to Armstrong and McManus, women did not participate in physical activities due to many reasons e.g. fear of not to conform to a desired physique and conflict between femininity and different activities. In contrast, giving high value to activities and sports in males' schools and putting high value to sports competence were the reasons for men's high participation in physical activities (cited by Hagger, Ashford & Stambulova, 1998).

European Youth Heart Study showed that majority of 16 years old boy students (82%) were performing recommended physical activity as compared to girl students (62%) (Riddoch, Bo, Wedderkopp, Harro, Klasson-Heggebø, Sardinha, Cooper & Ekelund, 2004). Among 16 years old students in Finland, 59% of the boys and 50% of the girls reported 60 minutes or more physical activity daily. However, where daily moderate to vigorous physical activity came, male students performed physical activity more (23%) than the female students (10%) (Tammelin, Ekelund, Remes & Näyhä, 2007). Insufficient vigorous physical activity could be a risk factor for higher BMI among male and female students (Patrick, Norman, Calfas, Sallis, Zabinski, Rupp & Cella, 2004). In a Finnish adolescent twins study, Aarnio, Winter, Kujala & Kaprio

found that at the age of 16 years, boys performing vigorous physical activities were persistent to physical activities 42% while 31% girls were persistent to vigorous physical activities. Asci, Macide & Koca, (2006) found that the persons with high social physique anxiety had more attraction towards physical activity as compared to those who had lower physique anxiety.

Al-Hazza, Abahussain, Al-Sobayel, Qahwaji and Musaiger (2011) found that vigorous physical activities were more commonly found among Saudi males than females. In the same study, it was also found that half of the males and less than quarter of the female were performing recommended moderate to vigorous physical activity per day. Abolfotouh, Bassiouni, Mounir and Fayyad (2007) found that 30% of the male university students were performing vigorous physical activities as compared to only 5% female university students. In another study Brodersen, Steptoe, Boniface & Wardle (2007) found that vigorous physical activity decreased and sedentary behaviours increased between the ages of 11-12 and 15-16 years. Moreover, decline was clearer among girls than boys.

6.2 Do gender affect significantly on students' dietary habits?

Consumption of fruits and vegetables is related to innumerable health benefits. Fruits and vegetables not only provide different vitamins, folic acid and phytochemicals but also low in calories (Liming, 2004). Women had lower tendency towards obesity or overweight which could be related to healthy nutrition (Stock, Wille & Kramer, 2001; Monneuse, Bellisle & Koppert, 1997). Consumption of fruits and vegetables behaviours had been assessed in this study due to countless benefits of them. Results of this study showed that Finnish female university students ($M = 23.34$, $SD = 4.25$) consume fruits and vegetables more than the male students ($M = 19.80$, $SD = 3.66$). Similar results were found by Unusan (2004) among Turkish university students where female students consumed more fruits and vegetables than male students. Female students preferred vegetables more at dinner and lunch. Kasmel, Helasoja, Lipand, Prattala, Klumbiene & Pudule (2004) found that one third of the participants were using fresh vegetables less than 3 days per week in Finland and Latvia while this figure reached up to more than half of the participants in Estonia and Lithuania. However, in all these countries women had tendency to consume vegetables more than the men.

Perera and Madhujith (2012) found that Sri Lankan university female students had more probability to consume fruits and vegetables than male students. However, majority of the students were not aware of the healthy benefits of consuming fruits and vegetables. Likelihood of eating fruits and vegetables increased up to 6.6% when gender changed from male to female. Monthly income also increased consumption of fruits and vegetables among students who belonged to rich families. Romaguera, Tauler, Bennasar, Pericas, Moreno, Martinez & Aguilo, (2011) found that physically active women consumed more fruits and vegetables than physically inactive women. On the other hand, it was also clear that physically active men were using fruits and vegetables more than the physically inactive women. Overall, men and women performing physical activity were consuming more fruits and vegetables than those who were not performing physical activity. Margareta, von Bothmer & Fridlund, (2005) found that female students had healthier food habits than male students in Sweden. Male students had lower knowledge of healthy food than female students. As a result of poor nutritional habits, male students were more obese and overweight than the male students.

Rasmussen, Krølner, R., Klepp, Lytle, Brug, Bere, & Due, (2006) performed a literature review on the determinants of fruits and vegetables among children and adolescents. A total of 49 articles were found on fruits and vegetables consumption. Of these 49 articles, 27 articles showed that girls had higher tendency in consuming fruits and vegetables. Eighteen studies did not show any difference between boys' and girls' fruits and vegetable consumption. However, four papers showed that boys were consuming fruits and vegetables more frequently than girls. Most of the papers analyzed gender effect was from US and Europe. Eighteen papers were found in US and a difference between genders was found only in six studies while 14 of the 17 studies found gender differences in European studies. Hence, gender difference in consuming fruits and vegetables is a phenomenon which is found more commonly among the children and adolescents of European countries as compared to US.

6.3 Do diet, physical activity and health locus of control variables contribute to quality of life?

Results of this study showed that chance locus of control and consumption of fruits and vegetables were significantly related to Finnish students' quality of life. Chance locus of control had negative but significant relation with quality of life. It means as the quality of life increases, chance locus of control decreases among the students. These findings are according to the previous studies (Karayurt & Dicle, 2008; Roddenberry & Renk, 2010). In an interventional study, it was suggested that a low fat, high fiber and fruits and vegetables plan could be adopted without having negative outcomes on overall quality of life. Data proposed that the negative effects were not experienced on the general feelings of wellbeing in both genders. Intervention group showed significantly higher confidence in taking care of their health (Corle, Sharbaugh, Mateski, Coney, Paskett, Cahill, Daston, Lanza & Schatzkin, 2001).

No association was found between physical health and level of physical activity among university students in this study. This is inconsistent with the previous studies conducted in elderly populations which showed strong association between physical activity and physical health (Bize, Johnson & Plotnikoff, 2007). This is proposed that elderly population with chronic diseases required physical activities which somehow improve their health. In this study, the participants were young and healthy and lack of association can be attributed partially to younger and healthy participants of this study.

6.4 Do diet, physical activity and health locus of control variables contribute to mental health?

Findings of this study showed that consumption of fruits and vegetables and chance health locus of control significantly contributed in mental health among Finnish university students. Mikolajczyk, El Ansari & Maxwell, (2009) showed that there was a relationship between consumption of sweets/fast foods and fruits/vegetables and perceived stress and between fruits/vegetables and meat and depressive symptoms. Moreover, loss of control mechanism could be triggered by stress and the people stop themselves from taking unhealthy and fatty food (Michaud, Kahn, Musse, Burlet, Nicolas & MeJean, 1990). Fruits, vegetables and salad were less commonly consumed during a stressful period which might describe the observed negative association between fruits/vegetables and perceived stress (Oliver & Wardle, 1999). Higher intake of fruits and vegetables had association with depressive symptoms of lower intensity among females (Mikolajczyk, El Ansari & Maxwell, 2009). These findings were inconsistent

with correlation between perceived stress and depressive symptoms (Mikolajczyk, Maxwell, Naydenova, Meier & El Ansari, 2008).

Chance locus of control had also significantly contributed in mental health of Finnish university students. There is no doubt that many factors play their roles in mental health (Xianyu & Lambert, 2006) and locus of control is considered as a potential personality factor which may contribute in mental health (Sarafina, 2002). Persons with internal locus of control think that their destiny is in their own hands while people with external locus of control think that their destiny is controlled by luck, chance or powerful others. This study showed that chance locus of control significantly but negatively contributed in mental health. Holder & Levi (1988) described that college students higher on external locus of control (chance and powerful others) showed higher score on The Symptom Checklist-90-R (SCL-90-R). Bagherian, Ahmadzadeh & Baghbanian (2009) found a positive and significant correlation between chance locus of control and depression, somatization and obsessive compulsive scores. However, no significant correlations were present between chance locus of control and aggression, anxiety, paranoia, phobia and interpersonal sensitivity. Horner, (1996) found that external locus of control (chance and powerful other) had relationship with higher level of actual stress and perceived stress. Moreover, locus of control, stress and neuroticism were the predictors of illness. Roddenberry & Renk (2010) found that psychological symptoms were significantly and positively associated with health related external locus of control (chance and powerful others).

6.5 Do diet, physical activity and health locus of control variables contribute to physical health?

Consumption of fruits and vegetables, chance health locus of control and moderate physical activity are significant contributors to physical health among Finnish university students in Finland. Many epidemiological studies showed that high consumption of fruits and vegetables were beneficial for health and precluded chronic diseases (Steinmetz & Potter, 1996; Ness & Powles, 1997; Reddy & Katan, 2004). In majority of the Western countries, adolescents and children consumed fruits and vegetables far less than the recommended amount (Krebs-Smith, Cook, Subar, Cleveland, Friday & Hahle, 1996; Munoz, Krebs-Smith, Ballard-Barbash & Cleveland, 1997; Yngve, Wold, Poortvliet, Elmadafa, Brug, Ehrenblad, Franchini, Haraldsdóttir, Krølner, Maes, Pérez-Rodrigo, Sjöström, Thórsdóttir & Klepp, 2005). Porter, Johnson &

Petrillo (2009) showed that 83% of the study participants were eating three or more servings of fruits and vegetables and 38% of the participants were performing moderate physical activities. Studies show that regular physical activity is a vital behaviour for health promotion, for prevention of musculoskeletal disorders like neck pain, mechanical low back pain and shoulder pain etc. It also decreases the risk of developing diabetes, hypertension, osteoporosis, obesity and cardiovascular diseases (Jone, Ainsworth & Croft 1998; Vuori, 1995). Yasunaga, Togo, Watanabe, Park, Shephard & Aoyagi (2006) found that physical activity had a relationship with health-related quality of life. Few studies also showed an association between cardiovascular fitness and health related quality of life (Sloan, Sawada, Martin, Church & Blair, 2009). Hamer & Stamatakis (2010) found that males had more tendencies for moderate to vigorous physical activity than females. They also found that the persons with highest moderate to vigorous had more than 50% less risk of describing poor health than those who performed the lowest moderate to vigorous physical activity. In a 10 year follow up study, male performing the lowest type of physical activity were at higher relative risk of poor perceived health (Malmberg, Miilunpalo, Pasanen, Vuori & Oja, 2005).

Health locus of control had been widely studied with regard to health-related behaviours (Wallston, Wallston, Kaplan & Maides, 1976). Wallston & Wallston (1982) found positive relationships of chance locus of control with physical symptoms and level of depression. However, they found that chance locus of control was negatively correlated with healthcare delivery process. Further, they also described that chance locus of control seemed to overlap with physical health and mental health. It caused to increase the possibility of chronic pain, and decreased desire to control for health treatment. Results of couple of studies showed correlation between internal locus of control and positive health-related behaviours and chance locus of control and delayed health behaviours (Bonetti, 2001; O'Carroll, 2001). It is clear in literature that chance locus of control correlates with physical indications, delayed response in healthcare seeking, depression and anxiety (Keedy, 2009).

6.6 Limitations of the study

This study has several limitations. As this is a cross-sectional study, the causal relationship of different variables cannot be determined. The participants of the study are university students, so the results cannot be generalized to the other groups of the population (old age individuals,

individuals with a particular disease). A self-reported questionnaire has been used in this study which can cause a recall bias because sometimes students cannot remember the things correctly which happened in the past. That's why; there are chances of recall bias in this study. Moreover, data were collected by a convenience sampling method and students' selection is not in a random fashion.

6.7 Future research and implications

A cross cultural study can be conducted to see the cultural differences among the students of Finland, Greece and Pakistan as the similar studies have been conducted in Greece and Pakistan. Vigorous physical activity is not significantly associated with quality of life (mental health) and health locus of control which should be studied further. It is suggested that longitudinal studies should be conducted and students should be followed for 4 years and data be repeated in order to better tracking of relationships between health/unhealthy behaviours and quality of life. Moreover, intervention studies are recommended to improve healthy behaviours and quality of life and finally cross-sectional data should be collected from more Finnish universities and applied sciences in order to get more significant results.

Results of this study can be used by the university authorities to see physical activity, quality of life and physical and mental health of the students. Physical activity promotion plans can be developed to enhance physical activity level among the students. University authorities can develop a curriculum or policy which should encourage physical activity among physically inactive students. These results can also help students to move their inactive lifestyles to active lifestyles. On the government level, results can be used to improve quality of life of the university students.

6.8 Conclusion

Consumption of fruits and vegetables and chance locus of control are significantly contributing to quality of life, physical and mental health among Finnish university students. However, moderate physical activity only contributes to the physical health. It is recommended that longitudinal studies should be conducted and students should be followed for 4 years so that data can be repeated for better tracking of relationships between health/unhealthy behaviours and quality of life. Intervention studies are required to improve healthy behaviours and quality of life. Moreover, cross-sectional

data should be collected from more Finnish universities and applied sciences universities in order to get more significant results.

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APPENDICES

Consent Form

I am a student of Master program in Sport and Exercise Psychology, University of Jyväskylä, Finland. I am going to write my thesis on “How are Health-Related Behaviours associated with Physical and Mental Health among university students in Finland”. The data will be collected from the students of University of Jyväskylä. If you are willing to volunteer for this study, please complete a questionnaire which will take approximately 20 minutes. The questionnaire consists of questions regarding your habits and health. You are under no requirement to participate in this study. You may refuse to participate or withdraw your name anytime. All of your answers will be kept confidential. Participation in this study means that you are also agreeing that the results may be used for scientific purposes like publication in journal as long as your anonymity is maintained. No known risks are associated with this study.

If you agree to participate in this study, which has been explained to you, please start to complete the questionnaire. If you have any questions about the questionnaire, please feel free to ask.

If you would like to have more information about this study, please feel free to contact me.

Muhammad Tayyab Minhas

Supervisor

Department of Sport Sciences

Mary Chassandra, PhD.

University of Jyväskylä

Senior Lecturer

Phone: 044-0282211

Department of Sport Sciences

tayyab.minhas@gmail.com

University of Jyväskylä

maria.m.chasandra@jyu.fi

Thank you for your participation!

Gender: Male: Female:	Date of birth: (dd/mm/year)
Nationality:	Height and Weight:cm kg
Family status: Single: Married: Divorced: Widow: Other:	Year of university study Bachelor (year): Master (year): PhD (year):
Study Subject:	Who supports your study financially: Parents: Part time job: Scholarship: Loan: Other:
Mother Education: Basic: Vocational: Bachelor: Master: PhD:	Father education: Basic: Vocational: Bachelor: Master: PhD:
With whom are you living: Parents: Alone: Sharing: Relatives: Friend: Hostel: Spouse/girlfriend/boyfriend: Other	Area of residence: Rural: Urban:

How did you feel? Please tick the appropriate answer (X)	More than usual	As usual	Less than usual	Much less than usual
1. Have you felt tense during the past weeks?				
2. Have you had problems with your sleep during the past weeks				
3. Have you been able to concentrate on what you have been doing during the past weeks?				

4. Do you feel that you have been useful during the past weeks				
5. Have you been able to make decisions in different areas during the past weeks?				
6. Have you during the past weeks been able to appreciate what you have been doing during the days?				
7. Have you been able to deal with your problems during the past weeks?				
8. Generally speaking, have you felt happy during the past weeks				
How did you feel? Please tick the appropriate answer (X)	Not at all	No more than usual	More than usual	Much more than usual
9. Have you felt unable to deal with your own personal problems during the past weeks?				
10. Have you felt unhappy and depressed during the past weeks				
11. Have you lost faith in yourself during the past weeks?				
12. Have you felt worthless during the past weeks?				

Please tick the appropriate answer (X)				
1. In general, would you say your health is				
Excellent	Very Good	Good	Fair	Poor
2. Compared to one year ago, how would you rate your health in general now?				
Much better than a year ago	Somewhat better now than a year ago	About the same as one year ago	Somewhat worse now than one year ago	Much worse now than one year ago

3. The following items are about activities you might do during a typical day. Does your health now	Yes, limited a lot	Yes, limited a little	No, not limited at all
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limit you in these activities? If so, how much?			
a. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.			
b. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf?			
c. Lifting or carrying groceries.			
d. Climbing several flights of stairs.			
e. Climbing one flight of stairs.			
f. Bending, kneeling or stooping.			
g. Walking more than one mile.			
h. Walking several blocks.			
i. Walking one block.			
j. Bathing or dressing yourself.			

4. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?	Yes	No
a. Cut down the amount of time you spent on work or other activities?		
b. Accomplished less than you would like?		
c. Were limited in the kind of work or other activities		
d. Had difficulty performing the work or other activities (for example, it took extra time)		
5. During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?	Yes	No
a. Cut down the amount of time you spent on work or other activities?		
b. Accomplished less than you would like		
c. Didn't do work or other activities as carefully as usual		

Please mark X in front of appropriate answer	Not at all	Slightly	Moderately	Quite a bit	Extremely
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6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?					
7. How much bodily pain have you had during the past 4 weeks?					
8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?					

For each question, please give the one answer that comes closest to the way you have been feeling.

9. These questions are about how you feel and how things have been with you during the past 4 weeks. How much of the time during the past 4 weeks.	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
a. did you feel full of energy?						
b. have you been a very nervous person?						
c. have you felt so down in the dumps nothing could cheer you up?						
d. have you felt calm and peaceful?						
e. did you have a lot of energy?						
f. have you felt downhearted and blue?						
g. did you feel worn out?						
h. have you been a happy person?						
i. did you feel tire?						
10. During the past 4 weeks, how much of the time has your						

physical health or emotional problems interfered with your social activities (like visiting friends, relatives, etc.)?						
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11. How TRUE or FALSE is each of the following statements for you?	Definitely True	Mostly true	Don't know	Mostly False	Definitely False
a. I seem to get sick a little easier than other people					
b. I am as healthy as anybody I know					
c. I expect my health to get worse					
d. My health is excellent					

Please mark an X in front of each question	Yes	No
1. Have you ever tried cigarette smoking, even one or two puffs?		
2. Have you ever smoked more than one cigarette every day for a month?		
3. During last month have you smoked even one day?		
4. During last 20 days have you smoked even one day?		
5. Do you smoke more than 10 cigarettes per day?		
6. How many cigarettes did you smoked during last week?	----- (number of cigarettes per week)	
7. How many cigarettes did you smoked yesterday? (Choose an answer) 0 <input type="checkbox"/> , 1-5 <input type="checkbox"/> , 6-10 <input type="checkbox"/> , 11-15 <input type="checkbox"/> , 16-20 <input type="checkbox"/> , 21-25 <input type="checkbox"/> , more than 26 <input type="checkbox"/>		

1. How often do you have a drink containing alcohol?				
Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?				
1 or 2	3 or 4	5 or 6	7 or 9	10 or more

Please tick the appropriate answer	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
3. How often do you have six or more drinks on one occasion?					
4. How often during the last year have you found that you were not able to stop drinking once you had started?					
5. How often during the last year have you failed to do what was normally expected of you because of drinking?					
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?					
7. How often during the last year have you had a feeling of guilt or remorse after drinking?					
8. How often during the last year have you been unable to remember what happened the night before because of your drinking?					

Please tick the appropriate answer	No	Yes, but not in the last year	Yes, during the last year
9. Have you or someone else been injured because of your drinking?			
10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?			

1=STRONGLY DISAGREE (SD)
2=MODERATELY DISAGREE (MD)
3=SLIGHTLY DISAGREE (D)

4=SLIGHTLY AGREE (A)
5=MODERATELY AGREE (MA)
6=STRONGLY AGREE (SA)

		SD	MD	D	A	MA	SA
1	If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
2	No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3	Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
4	Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5	Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
6	I am in control of my health.	1	2	3	4	5	6
7	My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
8	When I get sick, I am to blame.	1	2	3	4	5	6
9	Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
10	Health professionals control my health.	1	2	3	4	5	6
11	My good health is largely a matter of good fortune.	1	2	3	4	5	6
12	The main thing which affects my health is what I myself do.	1	2	3	4	5	6
13	If I take care of myself, I can avoid illness.	1	2	3	4	5	6
14	Whenever I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.	1	2	3	4	5	6
15	No matter what I do, I 'm likely to get sick.	1	2	3	4	5	6
16	If it's meant to be, I will stay healthy.	1	2	3	4	5	6
17	If I take the right actions, I can stay healthy.	1	2	3	4	5	6
18	Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging,

aerobics, or fast bicycling?		
-----Days per week	No vigorous activities (Skip to question 3)	
2. How much time did you usually spend doing vigorous physical activities on one of those days?		
----- hours per day	-----minutes per day	-----Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.		
-----Days per week	No moderate physical activities (Skip to question 5)	
4. How much time did you usually spend doing moderate physical activities on one of those days?		
----- hours per day	-----minutes per day	-----Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure

5. During the last 7 days, on how many days did you walk for at least 10 minutes at a time?		
-----Days per week	-----No walking (Skip to question 7)	
6. How much time did you usually spend walking on one of those days?		
----- hours per day	-----minutes per day	-----Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the last 7 days, how much time did you spend sitting on a week day?		
----- hours per day	-----minutes per day	-----Don't know/Not sure

Fruit and Vegetable Items

1. Do you eat more than 1 kind of fruit daily?	Always	Often	Sometimes	Never
2. During the past week, did you have citrus fruit or citrus juice?			Yes	No
3. Do you eat more than 1 kind of vegetable a day?	Always	Often	Sometimes	Never
4. How many servings of vegetable do you eat each day?	_____ servings			
5. Do you eat 2 or more servings of vegetable at your main meal?	Always	Often	Sometimes	Never
6. Do you eat fruit or vegetable as snacks?	Always	Often	Sometimes	Never
7. How many servings of fruit do you eat each day?	_____ servings			
8. During the past week, did you have raw vegetable?			Yes	No
9. Do you eat low - fat instead of high-fat foods?	Always	Often	Sometimes	Never
Milk Items:				
10. Do you drink milk daily?	Always	Often	Sometimes	Never
11. During the past week, did you have milk as a beverage or on cereal?			Yes	No
12. During the past week, did you have fish?			Yes	No
13. Do you take the skin off the chicken?	Always	Often	Sometimes	Never
14. How many times a week do you usually eat food from a fast - food restaurant?	_____ times			
15. During the past week, did you have eggs?			Yes	No
16. If you eat eggs, about how many eggs do you usually eat in a week?				
Diet Quality Items:				
17. When shopping, do you use the Nutrition Facts on the food label to choose foods?	Always	Often	Sometimes	Never
18. Do you drink regular soft drinks?	Always	Often	Sometimes	Never
19. Do you buy Thunder, Battery, Red Bull, R-20, Monster, Rodeo, Mad-Croc, Rockstar Recovery, Little Miracle, Vita Nova, Teho, ED, Driver Energy, Mega Force, Xpresso, Red Devil, Mixxed Up , or another fruit drink	Always	Often	Sometimes	Never

/ punch?					
20. Would you describe your diet as excellent, very good, good, fair, or poor?	Excellent	Very good	Good	Fair	Poor
Food Security Items:					
21. Do you run out of food before the end of the month?	Always	Often	Sometimes	Never	
22. Do you worry whether your food will run out before you can buy more?	Always	Often	Sometimes	Never	

This is the end of the questionnaire, thank you for your participation!

Suostumuslomake

Olen urheilu –ja liikuntapsykologian maisteriopiskelija Jyväskylän Yliopistosta. Teen pro gradu –tutkielmaani aiheesta ”Kuinka terveystietäytyminen on yhteydessä fyysiseen ja psyykkiseen terveyteen yliopisto-opiskelijoilla Suomessa”. Tutkimusaineisto kerätään Jyväskylän yliopiston opiskelijoilta. Jos haluat osallistua tutkimukseen, pyydän Sinua vastaamaan oheiseen kyselyyn. Kysely sisältää tapojanne ja terveyttänne koskevia kysymyksiä, joihin vastaamiseen menee arvioidusti noin 20 minuuttia. Tutkimukseen osallistuminen on täysin vapaaehtoista, ja voitte halutessanne keskeyttää vastaamisen milloin tahansa. Kaikki kerätty tieto on luottamuksellista. Tämän tutkimuksen puitteissa saatua tietoa voidaan julkaista tieteellisissä raporteissa tutkimukseen osallistuneiden yksityisyyden suojaa noudattaen.

Jos haluatte osallistua ylläkuvattuun tutkimukseen, voit aloittaa vastaamisen seuraaviin kysymyksiin. Tarvittaessa annan mielelläni lisätietoja vastaamiseen liittyen.

Jos haluatte lisätietoa tutkimuksesta, voitte ottaa yhteyttä sähköpostitse.

Muhammad Tayyab Minhas
Department of Sport Sciences
University of Jyväskylä
Phone: 044-0282211
tayyab.minhas@gmail.com

Supervisor
Mary Chassandra, P.hD.
Senior Lecturer
Department of Sport Sciences
University of Jyväskylä
maria.m.chassandra@jyu.fi

Kiitos osallistumisesta!

Sukupuoli: Mies: Nainen:	Syntymäaika: (päivä/kk/vuosi)
Kansalaisuus:	Pituus ja paino: cm..... kg.....
Sivilisääty: Naimaton:..... Naimisissa:.....Eronnut:.... Leski:..... Muu:.....	Opiskeluvuosi? Kandidaatti (vuosi):..... Maisteri (vuosi):..... Tohtori (vuosi):.....
Pääaine:	Kuka tukee sinua taloudellisesti/toimeentuloi: Vanhemmat:.....Osa-aikatyö:..... Apuraha:.....Laina:..... Muu:.....
Äidin koulutus: Peruskoulu:.....Ammatillinen..... Kandidaatti/AMK?.....Maisteri..... Tohtori.....	Isän koulutus: Peruskoulu:.....Ammatillinen..... Kandidaatti/AMK?.....Maisteri..... Tohtori.....
Asumismuoto? Vanhempien luona:.....Yksin:.....Kimppa/solu..... Sukulaisten luona.....Kaverin kanssa..... Puoliso/tyttöystävä/poikaystävä.....	Asuinalue: Maaseutu:..... Kaupunki:.....

Merkittä X sopivan vastauksen kohdalle	Paremminkin tavallisesti	Yhtä hyvin tavallisesti	Huonommin tavallisesti	Paljon huonommin kuin tavallisesti
1.Oletteko viime aikoina tuntenut olevanne jatkuvasti yllirasittunut?				
2.Oletteko viime aikoina valvonut paljon huolien takia?				
3.Oletteko viime aikoina pystynyt keskittymään tehtäviinne?				
4.Onko Teistä viime aikoina tuntunut siltä, että Teistä on hyötyä asioiden hoidossa?				
5.Oletteko viime aikoina tuntenut pystyväne tekemään päätöksiä?				
6.Oletteko viime aikoina kyennyt nauttimaan tavallisista päivittäisistä toimistanne?				
7.Oletteko viime aikoina kyennyt kohtaamaan vaikeuksia?				
8.Oletteko viime aikoina tuntenut itsenne kaiken kaikkiaan kohtalaisen onnelliseksi?				
Merkittä X sopivan vastauksen kohdalle	En Ollenkaan	En enempää kuin	tavallisesti	Jonkin verran
9.Onko Teistä viime aikoina tuntunut, ettette voisi selviytyä vaikeuksistanne?				
10. Oletteko viime aikoina tuntenut itsenne onnettomaksi ja masentuneeksi?				

11.Oletteko viime aikoina menettänyt itseluottamustanne?				
12.Oletteko viime aikoina tuntenut itsenne arvottomaksi?				

1. Onko terveytenne yleisesti ottaen				
Erinomainen	Varsin hyvä	Hyvä	Ydyttävä	Huono
2. Jos vertaatte nykyistä terveydentilaanne vuoden takaiseen, onko terveytenne yleisesti ottaen ...				
Tällä hetkellä paljon parempi kuin vuosi sitten	Tällä hetkellä jonkin verran parempi kuin vuosi sitten	Suunnilleen samanlainen	Tällä hetkellä jonkin verran huonompi kuin vuosi sitten	Tällä hetkellä paljon huonompi kuin vuosi sitten
3. Seuraavassa luetellaan erilaisia päivittäisiä toimintoja. Rajoittaako terveydentilanne nykyisin suoriutumistanne seuraavista päivittäisistä toiminnoista? Jos rajoittaa, kuinka paljon?		Kyllä, rajoittaa paljon	Kyllä, rajoittaa hiukan	Ei rajoita lainkaan
a. Huomattavia ponnistuksia vaativat toiminnat (esimerkiksi juokseminen, raskaiden tavaroiden nostelu, rasittava urheilu).				
b. Kohtuullisia ponnistuksia vaativat toiminnat, kuten pöydän siirtäminen, imurointi, keilailu				
c. Ruokakassien nostaminen tai kantaminen				
d. Nouseminen portaita useita kerroksia				
e. Nouseminen portaita yhden kerroksen				
f. Vartalon taivuttaminen, polvistuminen, kumartuminen				
g. Noin kahden kilometrin matkan kävely				
h. Noin puolen kilometrin matkan kävely.				
i. Noin 100 metrin matkan kävely				

j. Kylpeminen tai pukeutuminen			
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4. Onko teillä viimeisen 4 viikon aikana ollut RUUMIILLISEN TERVEYDENTILANNE TAKIA alla mainittuja ongelmia työssänne tai muissa tavanomaisissa päivittäisissä tehtävissänne?	Kyllä	Ei
a. Vähensitte työhön tai muihin tehtäviin käyttämäänne aikaa		
b. Saitte aikaiseksi vähemmän kuin halusitte		
c. Terveystilanne asetti teille rajoituksia joissakin työ- tai muissa tehtävissä		
d. Töistänne tai tehtävistänne suoriutuminen tuotti vaikeuksia (olette joutunut esim. ponnistelemaan tavallista enemmän)		
5. Onko teillä viimeisen 4 viikon aikana ollut TUNNE-ELÄMÄÄN LIITTYVIEN vaikeuksien (esim. masentuneisuus tai ahdistuneisuus) takia alla mainittuja ongelmia työssänne tai muissa tavanomaisissa päivittäisissä tehtävissänne?	Kyllä	Ei
a. Vähensitte työhön tai muihin tehtäviin käyttämäänne aikaa		
b. Saitte aikaiseksi vähemmän kuin halusitte		
c. Ette suorittanut töitänne tai muita tehtäviänne yhtähuolellisesti kuin tavallisesti		

Merkitkää X sopivan vastauksen kohdalle	Ei lainkaan	Hieman	Kohtalaisesti	Melko paljon	Erittäin paljon
6. MISSÄ MÄÄRIN ruumiillinen terveydentilanne tai tunne-elämän vaikeudet ovat viimeisen 4 viikon aikana häirinneet tavanomaista (sosiaalista) toimintaanne perheen, ystävien, naapureiden tai muiden ihmisten parissa?					
7. Kuinka voimakkaita ruumiillisia kipuja teillä on ollut viimeisen 4 viikon aikana?					
8. Kuinka paljon kipu on häirinnyt					

tavanomaista työtänne (kotona tai kodin ulkopuolella) viimeisen 4 viikon aikana?					
--	--	--	--	--	--

9. Seuraavat kysymykset koskevat sitä, miltä teistä on tuntunut viimeisen 4 viikon aikana. Merkitkää kunkin kysymyksen kohdalla se numero, joka parhaiten kuvaa tuntemuksianne.	Koko ajan	Suurimman osan aikaa	Huomattavan osan aikaa	Jonkin aikaa	Vähän aikaa	En lainkaan
a. Tuntunut olevanne täynnä elinvoimaa						
b. Ollut hyvin hermostunut						
c. Tuntunut mielialanne niin matalaksi, ettei mikään ole voinut teitä piristää						
d. Tuntunut itsenne tyyneksi ja rauhalliseksi						
e. Ollut täynnä tarmoa						
f. Tuntunut itsenne alakuloiseksi ja apeaksi						
g. Tuntunut itsenne "loppuunkuluneeksi"						
h. Ollut onnellinen						
i. Tuntunut itsenne väsyneeksi						
10. Kuinka suuren osan ajasta ruumiillinen terveydentilanne tai tunne-elämän vaikeudet ovat viimeisen 4 viikon aikana häirinneet tavanomaista sosiaalista toimintaanne (ystävien, sukulaisten, muiden ihmisten tapaaminen)?						

11. Kuinka hyvin seuraavat väittämät pitävät paikkansa teidän kohdallanne?	Pitää ehdottomasti paikkansa	Pitää enimmäkseen paikkansa	En ossa sanoa	Enimmäkseen ei pidä paikkansa	Ehdottomasti ei pidä paikkansa
a. Minusta tuntuu, että sairastun jonkin verran helpommin kuin muut ihmiset					
b. Olen vähintään yhtä terve kuin kaikki muutkin tuntemani ihmiset					
c. Uskon, että terveyteni tulee heikkenemään					
d. Terveyteni on erinomainen					

1. Oletko koskaan kokeillut tupakan polttoa, edes yksi tai kaksi henkäystä?	Kyllä <input type="checkbox"/>	Ei <input type="checkbox"/>
2. Oletko koskaan polttanut enemmän kuin yhden tupakan päivää kohden kuukauden ajan?	Kyllä <input type="checkbox"/>	Ei <input type="checkbox"/>
3. Oletko polttanut edes kerran viime kuukauden aikana?	Kyllä <input type="checkbox"/>	Ei <input type="checkbox"/>
4. Oletko polttanut edes kerran viimeisen 20 päivän aikana?	Kyllä <input type="checkbox"/>	Ei <input type="checkbox"/>
5. Poltatko enemmän kuin 10 tupakkaa päivää kohden?	Kyllä <input type="checkbox"/>	Ei <input type="checkbox"/>
6. Kuinka monta tupakkaa poltit viime viikon aikana?	----- (tupakoiden lukumäärä viikossa)	
7. Kuinka monta tupakkaa poltit eilen? (valitse vastauksesi) 0 <input type="checkbox"/> , 1-5 <input type="checkbox"/> , 6-10 <input type="checkbox"/> , 11-15 <input type="checkbox"/> , 16-20 <input type="checkbox"/> , 21-25 <input type="checkbox"/> , enemmän kuin 26 <input type="checkbox"/>		

1. Kuinka paljon juotte loutta, viiniä tai muita alkoholijuomia? Ottakaa mukaan myös ne kerrat, jolloin nautitte vain pieniä määriä, esim. paljon keskiolutta tai tikan viiniä.				
Ei koskaan	Noin kerran kuussa tai harvemmin	2-4 kerta kuussa	2-3 kerta viikossa	4 kerta viikossa tai useammin
2. Kuinka monta annosta alkoholiä olette ottanut, niinä päivinä, jolloin käytitte alkoholiä?				
1 or 2 annosta	3 or 4	5 or 6	7 or 9	10 or more

Merkitkää X sopivan vastauksen kohdalle	Ei koskaan	Harvemmin kuin kerran kuussa	Kerran kuussa	Kerran viikossa	Päivittäin tai lähes päivittäin
3. Kuinka usein olette juonut kerralla kuusi annosta tai enemmän					
4. Kuinka usein viime vuoden aikana Teille kävi niin, että ette pystynyt lopettamaan alkoholin käyttöä, kun olitte aloittanut?					
5. Kuinka usein viime vuoden aikana ette ole juomisen vuoksi saanut tehtyä jotain, mikä tavallisesti kuuluu tehtäviinne?					
6. Kuinka usein viime vuoden aikana runsaan juomisen jälkeen tarvitsitte aamulla olutta tai muuta alkoholia päästäksenne paremmin liikkeelle?					
7. Kuinka usein viime vuoden aikana tunsitte syyllisyyttä tai katumusta juomisen jälkeen?					
8. Kuinka usein viime vuoden aikana Teille kävi niin, että juomisen vuoksi ette pystynyt muistamaan edellisen illan tapahtumia?					

Merkitkää X sopivan vastauksen kohdalle	Ei	On, mutta ei viimeisen vuoden aikana	Kyllä, viimeisen vuoden aikana
9. Oletteko itse tai onko joku muu satuttanut tai loukannut itseään alkoholinkäyttönne seurauksena?			
10. Onko joku läheisenne tai ystävänne, lääkäri tai joku muu ollut huolissaan alkoholinkäytöstänne tai ehdottanut, että vähentäisitte juomista?			

1= Täysin eri mieltä 2= Kohtalaista Hyväksy 3= Hieman Eri Mieltä		4= Hieman Sopivat 5= Kohtalaista Sopivat 6= Täysin Samaa Mieltä					
1	Jos sairastun, riippuu omasta toiminnastani, kuinka pian paranen	1	2	3	4	5	6
2	Mitä sairastumiseen tulee, se tapahtuu mitä on tapahtuakseen.	1	2	3	4	5	6
3	Jos käyn säännöllisesti lääkärin vastaanotolla, on todennäköistä että vältän sairastumisen.	1	2	3	4	5	6
4	Sairastuminen on kohtalosta kiinni.	1	2	3	4	5	6
5	Aina kun voin huonosti, otan yhteyttä terveydenhuoltohenkilöstöön.	1	2	3	4	5	6
6	Minä olen yksin vastuussa terveydestäni.	1	2	3	4	5	6
7	Muilla ihmisillä on suuri osuus siinä, millainen vointini on.	1	2	3	4	5	6
8	Jos sairastun, se on omaa syytäni.	1	2	3	4	5	6
9	Onnella on suuri merkitys siinä, miten nopeasti toivun sairaudesta.	1	2	3	4	5	6
10	Lääkärin määräysten kirjallinen noudattaminen on paras tae siitä, etten sairastu.	1	2	3	4	5	6
11	Terveenä pysyminen riippuu hyvästä onnesta.	1	2	3	4	5	6
12	Terveenä pysyminen riippuu siitä mitä itse teen.	1	2	3	4	5	6
13	Jos huolehdin itsestäni, voin välttää sairaudet.	1	2	3	4	5	6
14	Muilta ihmisiltäni saamani apu auttaa toipumaan sairauksista.	1	2	3	4	5	6
15	Mitä tahansa teen, sairastun helposti.	1	2	3	4	5	6
16	Jos olen onnekas, pysyn terveenä.	1	2	3	4	5	6
17	Olen itse täysin vastuussa siitä, pysynkö terveenä.	1	2	3	4	5	6
18	Terveyteni suhteen voin tehdä vain mitä lääkäri käskää minun tehdä.	1	2	3	4	5	6

1. Kuinka monena päivänä viime viikon aikana fyysinen aktiivisuutesi oli ruumiillisesti **rasittavaa**, esimerkiksi painavien taakkojen nostamista, kaivamista, aerobicia, tai reipasta pyöräilyä? Rasittava fyysinen aktiivisuus tarkoittaa urheiluharjoittelussa: syke yli 60% maksimisykkeestä.

Ajattele vain niitä toimintoja, joita teit vähintään 10 minuuttia kerralla. (Rasti ruutuun)

-----Päivää viikossa

Ei voimakasta toimintaa (Siirry kysymykseen 3)

2. Kuinka paljon aikaa käytit yhteensä tavallisesti tuollaisena päivänä raskaaseen fyysiseen aktiivisuuteen?

----- Tunti päivässä

----- Minuuttia päivässä

----- En tiedä/ Ei varma

3. Kuinka monena päivänä viime viikon aikana fyysinen aktiivisuutesi oli kohtuukuormitteista, kuten kevyiden taakkojen kantamista tai pyöräilyä tasaista vauhtia? Älä laske mukaan kävelyä		
-----Päivää viikossa	No moderate physical activities Ei kohtalainen liikunta (Siirry kysymykseen 5)	
4. Kuinka paljon aikaa käytit yhteensä tavallisesti tuollaisena päivänä kohtuukuormitteiseen fyysiseen aktiivisuuteen?		
----- Tunti päivässä	----- Minuuttia päivässä	----- En tiedä/ Ei varma

5. Kuinka monena päivänä viime viikon aikana kävelit vähintään 10 minuuttia kerrallaan?		
----- Päivää viikossa	-----Ei kävely (Siirry kysymykseen 7)	
6. Kuinka paljon aikaa käytit yhteensä tavallisesti kävelyyn tuollaisena päivänä?		
----- Tunti päivässä	----- Minuuttia päivässä	----- En tiedä/ Ei varma

7. Tämä kysymys koskee aikaa, jonka käytit päivittäin istumiseen töissä, kotona, opiskellessasi tai vapaa-aikanasi. Tähän sisältyy aika, jonka käytit pöydän ääressä istumiseen, ystävien luona olemiseen, lukemiseen tai televisiota katsellessasi istumiseen tai loikoiluun.		
----- Tunti päivässä	----- Minuuttia päivässä	----- En tiedä/ Ei varma

1. Syötkö enemmän kuin yhtä sorttia hedelmiä päivittäin?	Aina	Usein	Joskus	En koskaan
2. Nautitko sitruhedelmän tai sitrujuoman menneen viikon aikana?			Kyllä	Ei
3. Syötkö enemmän kuin yhtä sorttia vihanneksia päivittäin?	Aina	Usein	Joskus	En koskaan
4. Kuinka monta annosta vihanneksia syöt päivää kohden?	-----Servings			
5. Syötkö enemmän kuin 2 annosta vihanneksia päuruokailussa?	Aina	Usein	Joskus	En koskaan

6. Syötkö hedelmiä tai vihanneksia välipalaksi?	Aina	Usein	Joskus	En koskaan	
7. Kuinka monta annosta hedelmiä syöt päivää kohden?	-----Servings				
8. Söitkö tuoreita vihanneksia menneen viikon aikana?			Kyllä	Ei	
9. Syötkö vähärasvaisia – korkearasvaisen ravinnon sijasta?	Aina	Usein	Joskus	En koskaan	
10. Juotko maitoa päivittäin?	Aina	Usein	Joskus	En koskaan	
11. Käytitkö maitoa juotavana tai murojen kanssa menneen viikon aikana?			Kyllä	Ei	
12. Söitkö kalaa menneen viikon aikana?			Kyllä	Ei	
13. Poistatko kanan nahan?	Aina	Usein	Joskus	En koskaan	
14. Kuinka monta kertaa syöt pikaruokaloissa viikoittain?					
15. Söitkö kananmunia menneen viikon aikana?			Kyllä	Ei	
16. Jos syöt kananmunia, kuinka monta kananmunaa syöt arvioidusti viikon aikana?					
17. Katsotko ravintoarvoja ostaessasi ruokaa?	Aina	Usein	Joskus	En koskaan	
18. Juotko tavallisia kevytjuomia?	Aina	Usein	Joskus	En koskaan	
19. Ostatko Thunder, Battery, Red Bull, R-20, Monster, Rodeo, Mad-Croc, Rockstar, Recovery, Little Miracle, Vita Nova, Teho, ED, Driver Energy, Mega Force, Xpresso, Red Devil, Mixxed up, tai muita hedelmäjuoma sekoituksia	Aina	Usein	Joskus	En koskaan	
20. Kuvailisitko ruokavaliotasi erinomaiseksi, oikein hyväksi, hyväksi, kohtalaiseksi, vai heikoksi?	Erinomainen	Oikein hyvä	Hyvä	Kohtalainen	Heikko
21. Loppuvatko ruokasi ennen	Aina	Usein	Joskus	En koskaan	

kuukauden päättymistä?				
22. Huolestuttaako sinua jos ruokasi loppuu ennen kuin voit ostaa lisää ruokaa?	Aina	Usein	Joskus	En koskaan

Kiitos osallistumisesta!