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RELATIONSHIP AMONG ENGAGEMENT IN HEALTH PROMOTING BEHAVIOURS, PERCEPTIONS OF HEALTH RELATED QUALITY OF LIFE, AND PERSONALITY

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Abstract

This study examined health promoting behaviours in healthy, normal functioning adults to investigate the relationships among engagement in health promoting behaviours, perceptions of health-related quality of life, and personality. Three tests were used, including a 20-item Mini-International Personality Item Pool (Mini-IPIP), 26-item World Health Organization Quality of Life (WHOQOL) measure, and an 81-item measure of Health Promoting Behaviours (HPB). Results based on 50 graduate students indicate that the HPB measure has good internal consistency for the full scale (Cronbach's alpha = .884) and acceptable consistency for individual subscales. Correlations between HPB and WHOQOL subscales ranged from .052 to .821; correlations between HPB and Mini-IPIP subscales ranged from – .421 to .558. The strongest correlation was observed between the Psychological domains of the HPB and WHOQOL measures. The strongest correlation for the HPB and Mini-IPIP was between the Psychological domain of the HPB and the Conscientiousness domain of the Mini-IPIP. Results suggest that health promoting behaviours are related to personality and health-related quality of life.

Keywords

Health promoting behaviours, health-related quality of life, personality

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Relationship Among Engagement in Health Promoting Behaviours, Perceptions of Health Related Quality of Life, and Personality

Chapter 1: Introduction

Health, as acknowledged by current definitions, is a complex, multi-faceted construct. The World Health Organization (WHO), the primary international body overseeing health worldwide, defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 2007, p. 1). Further, health can be viewed as "a basic and dynamic force in our daily lives" (Zeytinoglu, Moruz, Seaton, & Lillevik, 2003, p. v). Overall, health represents a personal resource that affects a person's feelings of well-being and enriches the quality of human life. Many other variables, such as income, freedom, and the environment (Guyatt, Feeny, & Patrick, 1993), affect a person's perceptions of well-being and the quality of one's life experiences. However, it is the health-related aspect of quality of life that is the specific focus of the present research.

There is a growing body of literature addressing the effect of disease states on quality of life. However, health is not merely the absence of disease, and therefore, the study of health-related quality of life encompasses more than the consequences of disease and infirmity.

It is increasingly apparent that behavioral personality factors can have an important role to play in health outcomes and health-related quality of life. In general terms, each person has a disposition to engage in some behaviours more than other behaviours, and these enduring patterns of behaviour can be associated with health outcomes. Type A behaviour is a well known example of the negative consequences of personality factors on health outcomes and health-related quality of life. Type A behavioural traits, such as extreme ambition, high competitiveness, impatience, and a high propensity for anger and hostility, have been repeatedly linked with coronary disease and other cardiovascular diseases (Krantz & Hedges, 1987).

Although there has been a tendency to focus on the negative consequences of personality factors when considering the relationship between personality and health, it is also reasonable to suppose that personality factors could have positive effects on health. This is particularly relevant when considering the effect of personality factors on engagement in health promoting behaviours. Moreover, it would be reasonable to anticipate that individual differences in personality factors and health promoting behaviours together would affect self-perceptions of health-related quality of life. The present investigation examined the relationships among perceptions of health-related quality of life, self-reported personality factors, and self-reported health promoting behaviours.

The following sections describe the three constructs used in the present investigation. As described below, the World Health Organization Quality of Life BREF (WHOQOL-BREF) is a general measure of health-related quality of life, the Mini International Personality Item Pool (Mini-IPIP) is a brief measure of personality based on the Five Factor Model of personality, and the Health Promoting Behaviours scale is a new measure developed for the purpose of the present investigation.

Health Related Quality of Life

Health related quality of life can be measured using two approaches; one focusing on general aspects of health in all types of individuals, and one focusing on specific aspects of health among specific groups of patients, states of diseases or areas of function (Guyatt, Feeny, & Patrick, 1993). Measures of health related quality of life that are specific in nature are not readily generalizable and are valid only for a specific set of individuals. Consequently, such measures are not appropriate for measuring health across the general population. A measure such as the WHOQOL-BREF is well-suited to examine health-related quality of life across the general population as it does not focus on a specific set of individuals with particular diseases or functional factors.

The WHOQOL-BREF is an assessment developed by an international research collaboration, known as the WHOQOL Group (1998). The WHOQOL-BREF measures "an individual's perceptions of their position in life in the context

of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (WHOQOL Group, 1998, p. 551). By focusing on the quality of life associated with health, this measure acknowledges that "widely valued aspects of life exist that are not generally considered "health," including income, freedom, and quality of the environment" (Guyatt, Feeny, & Patrick, 1993, p. 622).

The WHOQOL Group (1998) uses a definition of quality of life that allows for a subjective evaluation of quality of life, encompassing cultural, social and environmental components. The original scale that was developed (WHOQOL-100) consisted of 100 items that encompassed 24 facets grouped into four domains: physical, psychological, social relationships, and environment (WHOQOL Group, 1998). The WHOQOL-BREF contains 26 items, one from each facet as well as two general questions related to overall quality of life and general health.

The WHOQOL-BREF was compared to the WHOQOL-100 in terms of its internal consistency, discriminant validity, and criterion validity. As summarized below (Table 1), the WHOQOL-BREF serves as a "valid and reliable alternative to the assessment of domain profiles using the WHOQOL-100" (WHOQOL Group, 1998).

In terms of reliability, the WHOQOL-BREF has modestly lower reliability than the WHOQOL-100. Lower reliability for the WHOQOL-BREF is expected because of the smaller number of items included in the measure relative to the

WHOQOL-100. However, the decrease in reliability for the WHOQOL-BREF is minimal. Significant differences between groups of ill and well-persons were evidence of discriminant validity. Lastly, correlations between the WHOQOL-100 and WHOQOL-BREF for each of the domains are substantial, providing strong evidence of convergent validity. Overall, these findings support the use of the WHOQOL-BREF as an alternative to the longer WHOQOL-100.

Table 1

WHOQOL-BREF Psychometric Properties (WHOQOL, 1998)

Domains	Reliability[1]	Discriminant Validity[2]	Convergent Validity[3]
Physical Health			
WHOQOL-100	.860	.001	.660
WHOQOL-BREF	.800	.001	
Psychological			
WHOQOL-100	.820	.001	.720
WHOQOL-BREF	.760	.001	
Social Relationships			
WHOQOL-100	.730	.001	.760
WHOQOL-BREF	.660	.001	
Environment			
WHOQOL-100	.850	.020	.870
WHOQOL-BREF	.800	.010	
Sample Size	2369	2369	391

Note. [1] Cronbach's alpha; [2] *p* value associated with difference between ill and well persons; [3] correlation (*r*) between WHOQOL-100 and WHOQOL-BREF, administered within an interval of 2 to 8 weeks.

Personality Factors

Personality is referred to as "the distinctive patterns of behaviours (including thoughts and emotions) that characterize each individual's adaptation to the situations of his or her life" (Mischel, 1986, p.4). The Five Factor Model of

personality is an empirically-derived taxonomy of personality traits. There is a wide variety of personality traits, "the sum total of which constitutes a unique person unlike anyone else" (Crooks & Stein, 1991, p. 513). The personality dimensions in the Five Factor Model are general characteristics that serve to represent broad differences in human personality.

The Five Factor Model traces back to work by Allport and Odbert (1936), who searched the 1925 edition of the New International Dictionary to collect a comprehensive list of personality words. Their search yielded appropriately 18,000 words that could be used to describe personality characteristics. Since that time, there have been numerous studies of the ways in which persons use personality words. Studies have consistently supported the notion that there are five broad dimensions of personality.

The dimensions in the Five Factor model are Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Intellect/Imagination. A person with a high degree of Extraversion tends to be talkative, energetic, and assertive. A high degree of Agreeableness is characterized by a tendency to be sympathetic, kind, and affectionate. Conscientiousness represents a tendency to be organized, planful, and thorough. A high degree of Neuroticism is characterized by unpleasant emotions, such as anger, anxiety, and depression. Lastly, the Intellect/Imagination dimension represents an appreciation for novel ideas, curiosity, and an openness to experience.

The Mini International Personality Item Pool (Mini-IPIP) is a 20-item personality assessment, with 4 items used as indicators of each of the five dimensions of personality in the Five Factor Model (Donnellan, Oswald, Baird & Lucas, 2006). Items were selected from the International Personality Item Pool – Five Factor Model (Goldberg, 1999) to create a short measure of the five dimensions of the Big Five model. As shown in Table 2, the Mini-IPIP has a high level of convergent validity with the International Personality Item Pool – Five Factor Model (IPIP-FFM), and a good level of internal consistency and retest reliability. As summarized by Donnellan et al. (2006) "the 20-item Mini-IPIP is nearly as good as the longer 50-item IPIP-FFM parent instrument in terms of both reliability and validity" (p. 202). Correlations between the Mini-IPIP and the IPIP-FFM are strong, providing clear evidence of convergent validity and supporting the use of the Mini-IPIP as an alternative to the longer IPIP-FFM. Although estimates of internal consistency range from .650 to .770 across the five factors, these estimates represent strong evidence of internal consistency in light of the small number of items included in each domain. Retest reliabilities are strong across the five factors and vary only marginally from three weeks to six-nine months, providing strong evidence of retest reliability across time.

Table 2

Mini-IPIP Psychometric Properties (Donnellan et al., 2006)

Factor	Convergent Validity[1]	Internal Consistency[2]	Retest Reliability (3 week)	Retest Reliability (6-9 months)
Extraversion	.94	.77	.87	.86
Agreeableness	.91	.70	.62	.68
Conscientiousness	.90	.69	.75	.77
Neuroticism	.93	.68	.80	.82
Intellect/Imagination	.83	.65	.77	.75
Sample Size	329	2663	216	148

Note. [1] correlation (*r*) between the Mini-IPIP and the International Personality Item Pool – Five Factor Model; [2] Cronbach's alpha.

Health Promoting Behaviours

Health promotion is "the process of enabling people to increase control over and to improve their health" (Government of Ontario, 2007, p. 2). According to the Government of Ontario Ministry of Health Promotion, health promotion is becoming a "worldwide movement that is gaining momentum" (Government of Ontario, 2007, p. 2). Health promotion has also been described as involving the population as a whole "in the context of their everyday lives, rather than focusing on people at risk for specific diseases" (Government of Ontario, 2007, p.2). There is a broad and increasing emphasis on encouraging all individuals to engage in behaviours that minimize health risks and support overall health.

Health promotion is a fairly new field of inquiry, and it is not surprising for there to be a general lack of instruments to measure health promotion and health promoting behaviours. Two measures that are related to health promoting behaviours are the Health Promotion Survey (Statistics Canada Special Survey Division,1990), and the Health Promoting Lifestyles Profile (Walker, Sechrist, & Pender, 1987).

The Health Promotion Survey was developed by Statistics Canada with an objective to "expand the national and provincial baseline data on the knowledge, attitudes, beliefs, intentions and behaviours of adult Canadians on a wide range of health promotion issues" (Statistics Canada Special Survey Division, 1990, p. 5). The measure contains questions regarding factors influencing health and health in general, with the target population being anyone over the age of fifteen. This measure was last administered in 1990 and has since been discontinued for unknown reasons. Psychometric properties of the instrument are not known; therefore the quality and appropriateness of the instrument cannot be determined.

The second measure is the Health Promoting Lifestyles Profile (Walker et al., 1987). This measure was created to fulfill the need for a measure that focuses on health-enhancement as opposed to risk-reduction, as well as the need for a measure that is concise and comprehensive (Walker et al., 1987). The measure contains items related to 6 factors; self-actualization, health responsibility, exercise, nutrition, interpersonal support, and stress management.

This measure has reported to have sufficient validity and reliability to describe health promoting lifestyle components but has purposefully excluded items related to health risks.

Both the Health Promotion Survey and the Health Promoting Lifestyles Profile are more than twenty years old, and since that time, health promotion has taken on a much larger role in health research and health care delivery. Consequently, it was deemed important to develop a new measure that reflects the current emphasis in health promotion and captures contemporary aspects of everyday life.

An objective in designing a measure of health promoting behaviours was to create an instrument that could be used to obtain a broad perspective of health. The domains and facets developed by the WHOQOL Group (see Table 3) were used as a guide for the generation of items for the Health Promoting Behaviours measure. These domains and facets were used because the WHOQOL measures are applicable to a healthy population and cover a very broad range of behaviours reflecting contemporary lifestyle. The WHOQOL-BREF includes four domains: Physical Health, Psychological Health, Social Relationships, and Environment. These domains encompass a biopsychosocial perspective of health, acknowledging the importance of both physical and psychological factors, as well as the importance of social and environmental factors on overall health.

Table 3

WHOQOL-BREF Domains of Quality of Life (WHOQOL Group, 1998)

Domain	Facets incorporated within domains
1. Physical Health	Pain and discomfort
	Sleep and rest
	Energy and fatigue
	Mobility
	Activities of daily living
	Dependence on medicinal substances and medical aids
	Work Capacity
2. Psychological Health	Positive feelings
	Thinking, learning, memory and concentration
	Self-esteem
	Bodily image and appearance
	Negative feelings
	Spirituality/religion/personal beliefs
3. Social Relationships	Personal relationships
	Social support
	Sexual activity
4. Environment	Freedom, physical safety and security
	Home environment
	Financial resources
	Health and social care: accessibility and quality
	Opportunities for acquiring new information and skills
	Participation in and opportunities for recreation/leisure activity
	Physical environment (pollution/noise/traffic/climate)
	Transport

Summary

In summary, the present investigation examined the relationships among the WHOQOL-BREF, the Mini-IPIP, and a measure of Health Promoting Behaviours. As described earlier, the WHOQOL-BREF serves as a general measure of health-related quality of life, the Mini-IPIP provides a brief measure of personality based on the Five Factor Model of personality, and the Health Promoting Behaviours scale is an 81-item measure of Health Promoting Behaviours, developed for the purpose of the present investigation.

There is a body of literature which suggests the effect of personality on one's quality of life, and also how our behaviours are influenced by our personality, but there are additional relationships to be explored. The relationship between engagement in health promoting behaviours and health-related quality of life and the dynamic relationship among these three constructs will be explored further in this study.

It was anticipated that individual differences in personality and health promoting behaviours would relate to perceptions of health-related quality of life. This hypothesis was investigated by administering the WHOQOL-BREF, Mini-IPIP, and Health Promoting Behaviours measure to a sample of healthy, normal functioning university graduate students.

Chapter 2: Method

Participants

The participants were 50 graduate students (40 women, 9 men, 1 unreported), ranging in age from 21 to 57 years (M=28.7, SD=9.3), enrolled in a Masters-level methodology course in the Faculty of Health Sciences at The University of Western Ontario (71.4% response rate). Most of the participants were Masters-level students (n=42), as opposed to doctoral-level students (n=7); and, most participants lived in their own residence off campus.

By and large, university students are at an age where, having gained a degree of independence and responsibility in their lives, they begin to form lifelong habits and lifestyles that can affect longer term health (Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004). As Stock, Wille, and Krämer (2001) note, university students represent a population that has been neglected in health promotion research, despite its relevance to the development of behaviours that can impact future health. Early university years reflect a time of considerable lifestyle change for students. It is reasonable to assume that graduate students have adapted to a more independent adult lifestyle and that their behaviours are reasonably reflective of enduring adult lifestyle patterns.

Measurement Development

To generate items for the Health Promoting Behaviours measure, a list of possible components for each of the twenty-four facets within the four domains

listed in Table 3 was compiled from a variety of sources (Canadian Association for Community Care, 1996; Cassidy, 2000; Karvonen, Abel, Calmonte, & Rimpela, 2000; Kuusela, Honkala, Rimpela, Karvonen, & Rimpela, 1997; Nigg et al., 1999; Pomerleau, Pederson, Ostbye, Speechley, & Speechley, 1997; Sobal, Revicki, & DeForge, 1992). The items were worded appropriately for a five-point scale measuring agreement (strongly agree to strongly disagree). Several items specific to students and student lifestyles were generated to add to the item pool. After review of the items, the item pool was expanded to include more diversity among each of the facets, ensuring that the domain of health promoting behaviours was covered.

This item pool was then reviewed several times by a research committee consisting of three individuals. The first review consisted of editing the wording to ensure clarity and to target the key concept of each item; additional items were added as needed to capture the construct of health promoting behaviour. Several changes occurred during the second review of the measure. 'Frequency' terms, such as always, usually, tend to, were incorporated to allow participants to judge their behaviours on a five-point agreement scale (strongly agree, agree, neither agree nor disagree, disagree, strongly disagree).

Also at this stage, the Activities of Daily Living (ADL) facet was divided into two separate sub-facets, which included General ADLs and Student Specific ADLs. This was done to account for behaviours that students engage in regularly. A portion of most students' day is spent at school, attending class, or

engaging in school related activities, such as reading, studying, or completing assignments. These are behaviours and activities that need to be addressed when evaluating a student population, in addition to other more generic ADLs, such as house cleaning and personal hygiene.

Finally, the item pool was reviewed and redundant or overlapping items were removed. For the final review, items were reduced and refined to include only three items per facet. An additional facet, called Maladaptive Behaviours, comprising two sub-facets (Food and Alcohol/Cigarettes) was added. This facet accounts for behaviours that might be considered threatening to one's health. This facet captures the notion that the existence of health promoting behaviours does not necessarily assume the non-existence of these health threatening behaviours. The final measure consists of twenty-five facets with four underlying sub-facets, resulting in an 81-item measure of Health Promoting Behaviours (Appendix A).

Procedure

Upon the receipt of ethics approval, a battery of assessments was distributed to students at the end of class. The battery consisted of the WHOQOL-BREF, the Mini-IPIP, the Health Promoting Behaviours measure, and demographic questions. Demographic questions were related to the age, gender, level of study (graduate vs. undergraduate), living arrangements (parents home, on-campus, off-campus or other), and the participants program name (see

Appendix A). A student's completion and return of these materials indicated consent to participate in this study.

Chapter 3: Results and Discussion

Two sections of analyses are reported below. The first section examines the properties of the three measures individually, and the second section examines the relationships among these measures.

Properties of Individual Measures

The following section examines the properties of the WHOQOL-BREF, Mini-IPIP, and Health Promoting Behaviours measure, providing descriptive statistics and correlations among the domains measured by each instrument.

WHOQOL-BREF

The WHOQOL-BREF yields a total score that can range from 26 to 130 points, with higher scores indicating a higher overall rating of quality of life. The total score is composed of domain scores that range as follows: Physical, 7 to 35 points; Psychological, 6 to 30 points; Social Relationships, 3 to 15 points, and Environmental, 8 to 40 points. Each domain contains a different number of items depending on the number of facets within a domain (See Table 4). There are also two additional items that are general questions relating to health; these items do not belong to any particular domain but are included in the total score.

Table 4

WHOQOL-BREF Descriptive Statistics

Domain	Number of items	Mean	Standard Deviation	N
Physical	7	28.7	3.8	49
Psychological	6	22.6	3.2	49
Social Relationships	3	12.2	2.1	48
Environmental	8	32.7	4.2	48
Total Score	26	100.6	11.8	47

As presented in Table 4, the present sample of graduate students obtained relatively high scores in all domains of the WHOQOL-BREF, and the standard deviations reflect a reasonable level of variability in the scores. The scores in the present sample are comparable to those obtained in a much larger sample of healthy female subjects in a Danish study (Noerholm et al., 2004), indicating that these scores are reflective of a healthy adult population.

Correlations among the domains of the WHOQOL-BREF are presented in Table 5. These correlations range from .291 between the Environmental and Social Relationships domains to .647 between the Psychological and Physical domains. All domains are significantly correlated at the .05 level; this supports the practice of calculating a total score by summing the individual domain scores to obtain an overall measure of the construct of quality of life.

Table 5

Correlations among WHOQOL-BREF Domains

Domain	Physical	Psychological	Social Relationships
Psychological	.647		
Social Relationships	.328	.604	
Environmental	.591	.514	.291

Note: All correlations are statistically significant ($p<0.05$, two-tailed).

Mini-IPIP

The 20-item Mini-IPIP consists of five domains, each representing a distinct personality factor. The possible range of domain scores is from 4 to 20 points, where higher scores indicate a greater expression of a personality factor. As presented in Table 6, the mean levels of Agreeableness, Conscientiousness, and Intellect are somewhat above the mid-point of the scale, whereas the mean levels of Extraversion and Neuroticism fall quite near the mid-point of the scale. All five personality domains demonstrated a reasonable level of variability as reflected in the standard deviations of these domains. Each of these five domains represents an independent factor underlying individual differences in personality (Donnellan et al., 2006); this conception of personality is reflected in weak to modest relationships among the five domains within the Mini-IPIP (Table 7).

Table 6

Mini-IPIP Descriptive Statistics

Domain	Number of Items	Mean	Standard Deviation	N
Extraversion	4	12.0	2.1	50
Agreeableness	4	16.4	2.0	50
Conscientiousness	4	14.8	3.4	48
Neuroticism	4	11.6	2.8	50
Intellect	4	14.9	2.8	50

Table 7

Correlations Among Mini-IPIP Domains

Domain	Extraversion	Agreeableness	Conscientiousness	Neuroticism
Agreeableness	.203			
Conscientiousness	.022	.088		
Neuroticism	.144	-.028	-.285*	
Intellect	.241	.270	.032	.266

* $p < .05$ level (two-tailed)

Health Promoting Behaviours Measure

The Health Promoting Behaviours measure consists of 81 items within four domains. The measure yields a total score ranging from 81 to 405 points, with higher scores indicating a greater degree of involvement in behaviours that are

health promoting in nature. The four domains can range in score as follows: Physical, 24 to 120 points; Psychological, 18 to 90 points; Social Relationships, 9 to 45 points; Environmental, 30 to 150 points.

Unlike the previous two measures, the Health Promoting Behaviours measure is an instrument created specifically for use in the present study to evaluate the degree to which persons engage in health promoting behaviours. As it is a novel measure, two supplemental analyses are presented. First, the results of a principal components analysis is reported to provide a preliminary view of the internal structure of the measure, and, secondly, Cronbach's alpha estimates are reported to provide an assessment of the internal consistency of the measure. Thereafter, a description of the means, standard deviations, and correlations of domain scores are presented.

Principal Components Analysis. A principal components analysis was performed to provide a preliminary view of the internal structure of the measure. Four components were extracted and submitted to a varimax rotation. It should be noted that the current sample is small for this analysis, and, therefore, the results of this analysis are viewed as provisional and interpreted with caution.

The loadings of the 81 items on four principal components are summarized in Table 8. As an aid to visualizing the structure of the measure, component loadings less than .4 were omitted from the table. Consequently, it will be noted that loadings are not reported for some items.

In designing this measure, items were created to serve as indicators of particular domains. In the table, component loadings are bolded when an item loads on the component that it was designed to measure. In large part, the pattern of loadings is consistent with the initial design of the items and the original conception of the four domains. This pattern of component loadings (Table 8) suggests that Component 1 represents an Environmental domain, Components 2 and 3 represent Psychological and Physical Health domains, and Component 4 represents a Social Relationships domain.

Table 8

Principal Component Loadings for Health Promoting Behaviours Measure

	Loadings on Four Components					Loadings on Four Components (cont'd)			
Item	1	2	3	4	Item	1	2	3	4
Item 1		**.420**			Item 41				
Item 2			**.547**		Item 42	.452			**.559**
Item 3					Item 43				
Item 4				.588	Item 44	.598			
Item 5			**.569**		Item 45				
Item 6					Item 46	**.602**			
Item 7					Item 47		.426	.437	
Item 8		**.615**			Item 48	**.557**			
Item 9		**.669**			Item 49	**.440**		-.468	
Item 10					Item 50	**.460**	.535		
Item 11	.463				Item 51	**.488**			
Item 12			**.545**		Item 52	**.515**			
Item 13					Item 53		.440		
Item 14					Item 54				
Item 15				**.466**	Item 55	.490			
Item 16					Item 56	.616			
Item 17				**.409**	Item 57				
Item 18	**.572**				Item 58			**.497**	.440
Item 19	**.612**				Item 59				-.570
Item 20					Item 60		**.746**		
Item 21	**.693**				Item 61				
Item 22	**.463**				Item 62		**.814**		
Item 23				.633	Item 63		**.568**		
Item 24	**.475**				Item 64		**.807**		
Item 25					Item 65		**.634**		
Item 26			**.433**		Item 66			**.527**	
Item 27		**.446**			Item 67				
Item 28		**.442**			Item 68				
Item 29	.421				Item 69				**.482**
Item 30	.426				Item 70	.746			
Item 31			**.428**		Item 71	.701			
Item 32					Item 72	**.594**			
Item 33		**.621**			Item 73	**.480**			
Item 34					Item 74	**.583**			
Item 35		**.675**			Item 75				
Item 36		**.469**			Item 76	**.530**			
Item 37		**.709**			Item 77		.519	.503	
Item 38		.469	**.494**		Item 78				
Item 39			**.718**		Item 79	**.666**			
Item 40					Item 80	**-.558**			
Continued					Item 81				-.499

Table 9

Health Promoting Behaviours Measure Descriptive Statistics

Domain	Number of Items	Mean	Standard Deviation	Cronbach's Alpha (α)	N
Physical	24	82.9	9.3	.738	48
Psychological	18	68.6	7.8	.754	50
Social Relationships	9	36.9	4.5	.688	47
Environmental	30	115.4	12.4	.825	43
Total Score	81	306.4	24.6	.884	42

Internal Consistency. Cronbach's alpha was calculated for each of the domains to evaluate internal consistency. Each of the domains and the overall measure appear to have moderate to high levels of internal consistency (Table 9). The Social Relationships domain has the lowest internal consistency. A possible reason for this domain being lower than the other domains may be that it consists of fewer items. However, the internal consistency for the Social Relationships domain is acceptable and consistent with that reported for the Social Relationships domain of the WHOQOL-BREF, on which the scale was modeled.

Overall, the component structure and internal consistency estimates for the Health Promoting Behaviours measure are acceptable, indicating that the

measure effectively measures health promoting behaviour across the domains of physical health, psychological health, social relationships and environment.

Means, Standard Deviations, and Correlations. The means and standard deviations of domain scores are presented in Table 9. The mean values suggest that the present sample demonstrates moderate to high levels of health promoting behaviours, and the standard deviations reflect a reasonable level of variability in the scores. Correlations among the domains of the Health Promoting Behaviours measure are presented in Table 10, with values ranging from .209 to .663. The highest correlation was found between the Physical and Psychological domains; a similar correlation was found in WHOQOL-BREF, reflecting the parallel design of the two measures as well as a tendency for aspects of physical and psychological health to be related. Overall, the pattern of positive correlations among the domains suggests that they measure a common dimension of health promoting behaviours, and this finding supports the use of a composite score as a measure of engagement in health promoting behaviours.

Table 10

Correlations Among Domains of Health Promoting Behaviours Measure

Domain	Physical	Psychological	Social Relationships
Psychological	.663*		
Social Relationships	.209	.335*	
Environmental	.366*	.355*	.645**

* p< .05 level (two-tailed)

Relationships Between Individual Measures

It was anticipated that self-perceptions of health-related quality of life would be related to health promoting behaviours and individual differences in personality. In addition, it was reasonable to suppose that some personality factors would be more strongly related to engagement in health promoting behaviours than others. In this view, this section examines the relationship of the WHOQOL-BREF with the Health Promoting Behaviours measure, the relationship of the WHOQOL-BREF with the Mini-IPIP, and, lastly, the relationship of Health Promoting Behaviours measure with the Mini-IPIP.

WHOQOL-BREF and Health Promoting Behaviours

It was found that total scores on the Health Promoting Behaviours measure have a strong positive relationship (r = .682) with total scores on the WHOQOL-BREF. This result suggests that an increase in the frequency of health promoting behaviours is associated with an increase in self-perceived quality of life. The correlations among domain scores on the WHOQOL-BREF and domain scores on the Health Promoting Behaviours measure were also examined (Table 11). It was expected that the highest correlations would be along the diagonal between the matching domains on the two measures. This holds true for nearly all the domains with the exception of the Social Relationships domains. A possible reason for this lower correlation could be a modest degree of range

restriction given that the Social Relationships domain in the two measures have low standard deviations in comparison to the other domains. A lower level of variability could relate to the composition of the present sample; participants were mainly female graduate students living in their own residence off campus. The nature of their commitment to graduate school expectations may have contributed to modest restriction of variability regarding social relationships.

Table 11

Correlations Among WHOQOL-BREF Domains and Health Promoting Behaviours Measure Domains

	Health Promoting Behaviours			
WHOQOL-BREF	Physical	Psychological	Social Relationships	Environmental
Physical	.626*	.606*	.052	.173
Psychological	.628*	.821*	.259	.273
Social Relationships	.286	.589*	.172	.228
Environmental	.585*	.479*	.316*	.581*

* $p<.05$ level (two-tailed)

It is worth noting the strong relationship between the Psychological domain of the Health Promoting Behaviours measure and each of the WHOQOL-BREF domains. It seems reasonable to suppose that an increase in psychological health promoting behaviours would be associated with a general increase in self-perceived quality of life, such as measured by the Physical, Social Relationship, and Environmental domains of the WHOQOL-BREF.

WHOQOL-BREF and Mini-IPIP

In keeping with the Five Factor Model, the personality factors measured by the Mini-IPIP were treated as independent domains, and total scores were not calculated. As reported in Table 12, the correlations observed between the five Mini-IPIP domains and total scores on the WHOQOL-BREF ranged from - .457 to .562. In addition, the correlations observed between the five Mini-IPIP domains and specific domains of the WHOQOL-BREF ranged from - .457 to .588.

Table 12

Correlations Between WHOQOL-BREF Domains and Mini-IPIP Domains

	Mini-IPIP				
WHOQOL-BREF	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Intellect
Physical	- .043	- .234	- .427*	- .457*	- .100
Psychological	.095	- .210	.450*	- .451*	- .036
Social Relationships	.105	.166	.482*	- .255	.027
Environmental	.040	- .053	.518*	- .274	.057
Total Score	.058	- .133	.588*	- .457*	- .015

* $p<.05$ level (two-tailed)

The pattern of correlations in Table 12 suggests that Conscientiousness has a broad relationship with on health-related quality of life. Conscientiousness has moderate positive correlations with all domains of the WHOQOL-BREF, with the exception of the Physical Domain. Conscientiousness has a moderate,

negative correlation with the Physical Domain. The moderate relationships that a conscientious individual demonstrates with each of the WHOQOL-BREF domains indicates that this trait plays an important role in ratings of self-perceived health-related quality of life. The Physical domain appears to have an interesting relationship with the different personality traits as demonstrated by the negative correlations with each of the personality domains. This demonstrates that a higher affinity toward certain personality traits, primarily conscientiousness and neuroticism, results in lower overall scores in the physical domain of the WHOQOL-BREF.

The total scores of the WHOQOL-BREF clearly demonstrate the two personality traits that play a key role in self-perceived quality of life ratings. Conscientiousness seems to play a positive role in self-perceived quality of life ratings, indicating that individuals who are organized, planful and thorough believe they have a better health-related quality of life. On the other hand, individuals who are angry, anxious or depressed have lower overall ratings of self-perceived health-related quality of life, and this extends to each of the domains individually as well. The relationships of Conscientiousness and Neuroticism to overall health-related quality of life are reflected in each of the quality of life domains.

Mini-IPIP and Health Promoting Behaviours

As reported in Table 13, the correlations observed between the five Mini-IPIP domains and total scores on the Health Promoting Behaviours measure ranged from - .277 to .562. In addition, the correlations observed between the five Mini-IPIP domains and specific domains of Health Promoting Behaviours ranged from - .421 to .558.

Table 13

Correlations between Health Promoting Behaviours Measure Domains and Mini-IPIP Domains

	Mini-IPIP				
Health Promoting Behaviors	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Intellect
Physical	.098	-.174	.535*	-.356*	.099
Psychological	.018	.005	.558*	-.421*	.173
Social Relationships	.231	.379*	.107	-.046	.237
Environmental	.105	.477*	.417*	-.115	.225
Total Score	.124	.411*	.562*	- .246	.277

* $p<.05$ level (two-tailed)

It is apparent that some personality factors are related to engagement in health promoting behaviours. In particular, the domain of Conscientiousness is significantly correlated with three of four domains of health promoting behaviours. Overall, someone who is more conscientious appears to be more likely to

engage in health promoting behaviours; and, in the longer term, it is possible that such health promoting behaviours might lessen the risk of lifestyle-related illnesses, such as Type 2 diabetes, or cardiovascular disease.

Lastly, it is worth noting that conscientiousness, as measured by the Mini-IPIP, and the overall level of engagement in health promoting behaviours, as measured by total score on the Health Promoting Behaviours measures, have a multiple correlation of .711 with health-related quality of life, as measured by the total score on the WHOQOL-BREF [R=.711, $F(2, 38)$= 19.441, p<.05]. Conscientiousness and overall engagement in health promoting behaviours in combination account for nearly 50% of the variability in health-related quality of life. Overall, it is apparent that individual differences in personality factors and health promoting behaviours, together affect self-perceptions of health-related quality of life. Although, historically, there has been a focus on negative consequences of personality factors, such as Type A behavioural traits, the present results suggest that personality factors can have a positive effect on engagement in health promoting behaviours, and together, personality factors and health promoting behaviours may have a positive impact on self-perceptions of health-related quality of life.

Chapter 4: General Discussion

The purpose of this study was to investigate health promoting behaviours in a group of healthy, normal functioning persons to explore the relationship among personality factors, engagement in health promoting behaviours, and self-perceptions of health-related quality of life. The present study focused on healthy, normal functioning individuals in their everyday lives.

The results of this study indicate that not only can health-promoting behaviours be measured in a manner to reflect the biopsychosocial aspects of health as advocated by the World Health Organization, but health promoting behaviours are related to personality as well as to health-related quality of life. In particular, the conscientiousness aspect of personality is related to health-promoting behaviours, and in combination, conscientiousness and health promoting behaviours account for a substantial amount of variability in health-related quality of life. These findings suggest that health-promotion programs could benefit from consideration of personality factors among the target population. Individuals with a greater tendency toward conscientiousness may be more likely to be receptive to health-promotion programs. Consequently, for health-promotion programs to have broad impact, they should be developed in a manner that attempts to appeal to those with fewer tendencies toward conscientious personality traits.

Conversely, results of this study indicate that those individuals with a tendency toward neurotic personality traits show evidence of the potential to be considered a population which is as risk of engaging in fewer health promoting behaviours. This could result in a lower self-reported quality of life as well as a higher risk toward lifestyle related conditions, as previously mentioned. Another indication of a population which might be at risk would be those individuals who lack a supportive environment which allows them to engage in health promoting behaviours. Without the supporting environment it becomes increasingly difficult for individuals to engage in health promoting behaviours, again putting these individuals at a higher risk of developing a health condition than those individuals with a supporting environment.

As previously mentioned, university students are at an age where, having gained a degree of independence and responsibility in their life, they begin to form lifelong habits and lifestyles that can affect longer-term health (Von Ah, *et al.,* 2004). As Stock *et al.* (2001) note, university students represent a population that has been neglected in health promotion research, despite its relevance to the development of behaviours that can impact future health.

Although this study presents valuable results, it is not without limitations. Due to the nature of the sample with a higher ratio of females to males as well as the high education level of the participants this did not allow for any gender comparisons and may limit the generalizability of the results. A larger and more diverse sample of individuals would be needed to make these generalizations.

There are other populations which would be of interest to examine in a similar study. For example, a sample of children and youth where one could examine the behaviours in which they are engaging. This might give an indication as to how to facilitate these types of behaviours to ensure that health promoting behaviours become routine behaviours. Also, it would be interesting to examine an entire community to determine if there are aspects in a community setting, such as the environment that could be improved in a manner that encourages participation in health promoting behaviours.

Health Promoting Behaviours

As the field of health promotion continues to evolve, it will be important to continue the development of measurement instruments to serve this field of inquiry. The Health Promoting Behaviours measure was developed to serve the aims of the present investigation. This measure has shown a number of strong patterns of results, suggesting that this novel instrument could have broader utility as a measurement instrument in the field of health promotion.

The current version of the measure of Health Promoting behaviours has questions that are specifically geared towards a student population. If this measure were to be used with a different sample, there may be a need to include various other items that would be specific to the population. Ideally this measure would have a list of core items that are non specific in terms of the population,

and then have a list of items that would relate to specific populations (e.g., children, students, adults, elderly).

The Health Promoting Behaviours measure is a novel measure that has provided a great deal of information regarding the relationships among engagement in health promoting behaviours, perceptions of health-related quality of life and personality. The information presented can be used to implement new policies related to health promotion initiatives as well as target populations or groups who are in need of assistance so there are greater opportunities to engage in such behaviours.

At the present time, this measure requires more extensive psychometric testing and further refinement. This study provides detailed evidence and support for further use of the Health Promoting Behaviours measure.

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Appendix A

Letter of Information & Battery of Tests

Letter of Information

Title of Study: Relationship Between Health Promoting Behaviours and Perceptions of Health Related to Quality of Life

Investigators: S. Miller, graduate student, Health and Rehabilitation Sciences graduate program;
C. Lee, PhD, Associate Professor, Faculty of Health Sciences

You are being invited to participate in a research study looking at the relationship between engagement in health promoting behaviors and perception of health-related quality of life. Very little is known about the role of health promoting behaviors on perceptions of quality of life, and the purpose of this study is to better understand the nature of the health-promoting behaviors of university students. To this end, we are asking about 100 students (both undergraduate and graduates students) to complete three questionnaires.

If you agree to participate in this study, you will be asked to complete the following three questionnaires:

- an inventory of Health Promoting Behaviours for university students
- a brief inventory of personality-related behaviors
- a questionnaire about health-related quality of life.

It will take about 30 minutes of your time to complete these questionnaires.

Participation in this study is voluntary. Completion of these questionnaires is indication of your consent to participate. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time with no effect on your academic status.

There are no known risks to your participation in this study, and there is no benefit to you associated with your participation in this study.

Your confidentiality will be respected. No personal identifiers will be collected; thus, no information that discloses your identity will be involved in any presentation or publication of the study. All research materials will be stored in a locked cabinet in a secure office, and they will be destroyed after a period of one year.

If you have any questions about this study, please contact Dr. Christopher Lee at 661-2111.

If you have any questions about your rights as a research participant or the conduct of the study you may contact The Office of Research Ethics at (519) 661-3036 or by email at ethics@uwo.ca.

This letter is for you to keep.

Please complete the following three questionnaires which follow the demographic information. Instructions are provided at the beginning of each questionnaire. Thank you for your participation.

Age: _____

Sex (circle one): M F

Living arrangements (check one):

- ☐ Parents Home
- ☐ On-Campus (residence)
- ☐ Off-Campus housing
- ☐ Other (please specify):_____

Program Name: _____

Level of Study:

- ☐ Undergraduate
- ☐ Graduate

Health Promoting Behaviours Measure

The following measure contains phrases describing people's behaviors. Please use the rating scale below to describe how accurately each statement describes *you*. Describe yourself as you generally are now, not as you wish to be in the future. Please read each statement carefully, and then circle the number that corresponds to the level of agreement on the scale.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

1	I will often use behaviours such as stretching or resting to deal with any pain I experience.	1 2 3 4 5
2	I often feel run down.	1 2 3 4 5
3	I usually get enough sleep to feel rested.	1 2 3 4 5
4	I routinely use the stairs rather than the elevator or escalator.	1 2 3 4 5
5	I take good care of myself.	1 2 3 4 5
6	I attend class on a regular basis.	1 2 3 4 5
7	I tend to need caffeine or other stimulants to stay focused.	1 2 3 4 5
8	I have good organizational skills.	1 2 3 4 5
9	I am achieving my academic goals.	1 2 3 4 5
10	I am satisfied with my performance on exams and assignments.	1 2 3 4 5
11	I have good friends.	1 2 3 4 5
12	I am satisfied with my physical appearance.	1 2 3 4 5
13	I find it difficult to get motivated when it comes to doing school work.	1 2 3 4 5
14	I would never cheat on an exam or assignment.	1 2 3 4 5
15	I value my friends and family.	1 2 3 4 5
16	I tend to talk with others when I am faced with a difficult situation.	1 2 3 4 5
17	I regularly engage in healthy sexual behaviours (use of condom, abstinence).	1 2 3 4 5
18	I am cautious about my personal safety.	1 2 3 4 5
19	I like my living accommodations (house, apartment, residence).	1 2 3 4 5
20	I require a part-time job to make ends meet.	1 2 3 4 5
21	I go to the doctor for regular check ups.	1 2 3 4 5
22	I know where to find information about living a healthy lifestyle.	1 2 3 4 5
23	I enjoy outdoor activities.	1 2 3 4 5
24	I regularly use sunscreen.	1 2 3 4 5
25	I wear my seatbelt when travelling in a vehicle.	1 2 3 4 5
26	I tend to skip meals.	1 2 3 4 5
27	I often use alcohol to cope with stress.	1 2 3 4 5
28	I tend to ignore any pain that I experience.	1 2 3 4 5
29	I consider myself to be an energetic person.	1 2 3 4 5

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

30	I am able to stay focused in class.	1 2 3 4 5
31	I usually walk rather than take a car or bus.	1 2 3 4 5
32	I clean my home regularly.	1 2 3 4 5
33	I am always on time for class.	1 2 3 4 5
34	I sometimes use medication to help me sleep.	1 2 3 4 5
35	I am generally able to handle my course load.	1 2 3 4 5
36	I have a positive outlook on life.	1 2 3 4 5
37	I feel my study methods are generally effective.	1 2 3 4 5
38	I feel good about myself.	1 2 3 4 5
39	I am satisfied with my weight.	1 2 3 4 5
40	I am easily irritated.	1 2 3 4 5
41	It is important to me to have time to myself.	1 2 3 4 5
42	I enjoy spending time with others.	1 2 3 4 5
43	I tend to be open about my feelings.	1 2 3 4 5
44	I have regular physical examinations.	1 2 3 4 5
45	I listen to my mp3 player at a safe volume.	1 2 3 4 5
46	My home is comfortable.	1 2 3 4 5
47	I have enough money to lead a healthy lifestyle.	1 2 3 4 5
48	I seek medical advice when I am sick.	1 2 3 4 5
49	I try to learn as much as possible about any medications I take.	1 2 3 4 5
50	I have a satisfying social life.	1 2 3 4 5
51	I wear a helmet when biking or rollerblading.	1 2 3 4 5
52	I seldom use a cell phone when driving.	1 2 3 4 5
53	I tend to ignore the nutritional information provided on food products.	1 2 3 4 5
54	I smoke cigarettes.	1 2 3 4 5
55	I use medication (eg. Acetaminophen, ibuprofen) to deal with any pain I experience.	1 2 3 4 5
56	I eat foods that help me feel energized.	1 2 3 4 5
57	I often keep long hours.	1 2 3 4 5
58	I often use modes of transportation such as biking or rollerblading	1 2 3 4 5
59	I tend to eat foods that are quick and easy to prepare.	1 2 3 4 5
60	I keep up with my assignments, reading studying.	1 2 3 4 5
61	I take medication when I am not feeling well.	1 2 3 4 5
62	I am usually able to keep up with course requirements.	1 2 3 4 5

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

63	I am enjoying my university experience.	1 2 3 4 5
64	My memory for course material is usually good.	1 2 3 4 5
65	I feel good about my future.	1 2 3 4 5
66	On most days I take time for some form of physical activity (sports, exercise, brisk walking).	1 2 3 4 5
67	I tend to avoid responsibility.	1 2 3 4 5
68	I believe spirituality is an important part of daily life.	1 2 3 4 5
69	I enjoy belonging to a club, team or organization.	1 2 3 4 5
70	I willingly provide support for my friends and family in difficult situations.	1 2 3 4 5
71	I am well informed about sexual transmitted diseases.	1 2 3 4 5
72	I live in a safe neighbourhood.	1 2 3 4 5
73	I generally feel relaxed when I am at home.	1 2 3 4 5
74	I have friends or family who would provide financial support if I was in need of it.	1 2 3 4 5
75	I have regular visits to the dentist.	1 2 3 4 5
76	I am an avid consumer of health information.	1 2 3 4 5
77	I am able to take the time to do activities I enjoy.	1 2 3 4 5
78	I routinely wear sunglasses.	1 2 3 4 5
79	I am a cautious driver.	1 2 3 4 5
80	I tend to use food to relieve stress.	1 2 3 4 5
81	I am regularly exposed to second hand smoke.	1 2 3 4 5

20-Item Mini-IPIP

The following measure contains phrases describing people's behaviors. Please use the rating scale below to describe how accurately each statement describes *you*. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. Please read each statement carefully, and then circle the number that corresponds to the level of agreement on the scale.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

1	Am the life of the party.	1 2 3 4 5
2	Sympathize with others' feelings	1 2 3 4 5
3	Get chores done right away.	1 2 3 4 5
4	Have frequent mood swings.	1 2 3 4 5
5	Have a vivid imagination.	1 2 3 4 5
6	Don't talk a lot.	1 2 3 4 5
7	Am not interested in other people's problems.	1 2 3 4 5
8	Often forget to put things back in their proper place.	1 2 3 4 5
9	Am relaxed most of the time.	1 2 3 4 5
10	Am not interested in abstract ideas.	1 2 3 4 5
11	Talk to a lot of different people at parties.	1 2 3 4 5
12	Feel others' emotions.	1 2 3 4 5
13	Like order.	1 2 3 4 5
14	Get upset easily.	1 2 3 4 5
15	Have difficulty understanding abstract ideas.	1 2 3 4 5
16	Keep in the background.	1 2 3 4 5
17	Am not really interested in others.	1 2 3 4 5
18	Make a mess of things.	1 2 3 4 5
19	Seldom feel blue.	1 2 3 4 5
20	Do not have a good imagination.	1 2 3 4 5

WHOQOL-BREF

The following questions ask how you feel about your quality of life, health, or other areas of your life. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one. Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks.**

		Very Poor	Poor	Neither poor nor good	Good	Very good
1.	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2.	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last four weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3.	To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1
4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7.	How well are you able to concentrate?	1	2	3	4	5
8.	How safe do you feel in your daily life?	1	2	3	4	5
9.	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

		Not at all	A little	Moderately	Mostly	Completely
10.	Do you have enough energy for everyday life?	1	2	3	4	5
11.	Are you able to accept your bodily appearance?	1	2	3	4	5
12.	Have you enough money to meet your needs?	1	2	3	4	5
13.	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14.	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15.	How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16.	How satisfied are you with your sleep?	1	2	3	4	5
17.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18.	How satisfied are you with your capacity for work?	1	2	3	4	5
20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
23.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24.	How satisfied are you with your access to health services?	1	2	3	4	5
25.	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to how often you have felt or experienced certain things in the last four weeks.

		Never	Seldom	Quite often	Very often	Always
26.	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	1	2	3	4	5

Appendix B

Ethics Approval

Office of Research Ethics

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Use of Human Subjects - Ethics Approval Notice

Principal Investigator: Dr. C. Lee
Review Number: **13622E** **Review Level:** Expedited
Review Date: September 26, 2007
Protocol Title: Relationship Between Health Promoting Behaviours and Perceptions of Health Related to Quality of Life
Department and Institution: Other, University of Western Ontario
Sponsor:
Ethics Approval Date: October 2, 2007 **Expiry Date:** April 30, 2008
Documents Reviewed and Approved: UWO Protocol, Letter of Information
Documents Received for Information:

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines; and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced study on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

The ethics approval for this study shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

During the course of the research, no deviations from, or changes to, the protocol or consent form may be initiated without prior written approval from the HSREB except when necessary to eliminate immediate hazards to the subject or when the change(s) involve only logistical or administrative aspects of the study (e.g. change of monitor, telephone number). Expedited review of minor change(s) in ongoing studies will be considered. Subjects must receive a copy of the signed information/consent documentation.

Investigators must promptly also report to the HSREB:

a) changes increasing the risk to the participant(s) and/or affecting significantly the conduct of the study;
b) all adverse and unexpected experiences or events that are both serious and unexpected;
c) new information that may adversely affect the safety of the subjects or the conduct of the study.

If these changes/adverse events require a change to the information/consent documentation, and/or recruitment advertisement, the newly revised information/consent documentation, and/or advertisement, must be submitted to this office for approval.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

Chair of HSREB: Dr. John W. McDonald

Ethics Officer to Contact for Further Information			
☐ Janice Sutherland (jsutherland@uwo.ca)	☐ Jennifer McEwen (jmcewen4@uwo.ca)	☑ Grace Kelly (gkelly2@uwo.ca)	☐ Denise Grafton (dgrafton@uwo.ca)

This is an official document. Please retain the original in your files.

cc: ORE File