Sub-health and Health-related Quality of Life

Submitted by

HUANG WENWEI

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B. Med.; M. Med.

for the degree of Doctor of Philosophy

at The University of Hong Kong

in January 2013

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Abstract of thesis entitled

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Abstract

Sub-health and Health-related Quality of Life

Sub-health has been used to describe an intermediate state between health and disease. The impact of SH on HRQOL deserves more attention because HRQOL is an important goal of health care, and a significant determinant of health service utilization.

The aim of this study was to establish the epidemiology of Sub-health and explore the relationship between SH and HRQOL. Two studies were conducted in Hong Kong.

The first study was to develop and validate a Sub-health questionnaire (SHQ) for classifying people into Health, SH & Disease. The standard 7-step method of development of a psychometric measure was used to develop the SHQ. The initial SHQ, was then field tested on a sample of 13 Chinese adults. Pilot testing of the final version was conducted on 55 Chinese adults to confirm. Psychometric testing by a longitudinal survey on 353 Chinese adults who completed the SHQ, the SF-12v2

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Health Survey and a structured questionnaire on sociodemographic data, and health service utilization at baseline, 2 to 4 weeks and 3-month. All HS items had Content Validity Index (CVI) on clarity and relevance of > 75%. The HS items demonstrated good internal consistency (Cronbach's alpha=0.82). The overall test-retest reliabilities of classification of the health state were moderate with Kappa > 0.57. The SHQ was responsive in detecting a change in health states in 36.4% subjects in 3 months. Item scores of HS scales had significant correlation (r>0.4) with corresponding SF-12v2 scores, and there were significant differences in SF-12v2 summary scores between SHQ groups.

The second was a longitudinal study on Sub-health and HRQOL of general population to evaluate the validity and psychometric property of SHQ, to establish determine the epidemiology SH, and to explore the relationship between HRQOL of SH. 1231 Chinese adults were randomly selected from the general population by telephone survey with the SHQ, SF-12 Health Survey and a structured questionnaire on demographics and service utilization. 353 subjects had completed 3 to 12 months follow up surveys. The prevalence of Sub-health is 40.67% in Hong Kong. There were significant differences in SF-12v2 scores in

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that SH group had higher scores than those of disease group but lower scores than those of health group. SH was associated with higher use of medical resources than health.

Conclusively, the SHQ is a useful screening tool for the diagnosis of SH. There is a linear relationship between change in health status and changes in HRQOL or health service utilizations. It preliminary explored the clinical relevance of the SH to a culture and health care system that is different from that of mainland China where the concept originated. The results would be useful in populations worldwide if the SHQ could be cross-culturally adapted to identify the SH epidemiology. The study has also, provided evidence supporting the conceptual base of SH in the Chinese medicine context, which may be modifiable by treatment based on TCM Body Constitution classification.

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Declaration

I declare that this thesis represents my own work, except where due acknowledgement in made, and this is has not been previously included in a thesis, dissertation or report submitted to this University or to any other institution for a degree, diploma or other qualification.

Signed:

Name: HUANG WENWEI (黃文偉)

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Sub-health and Health-related Quality of Life

HUANG WENWEI

黃文偉

Ph.D Thesis

The University of Hong Kong

January 2013

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To My Family and Integrative Medicine

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Ethics Approval

Ethics approval was granted by the Institutional review board of the University of Hong Kong/Hospital Authority Hong Kong West cluster with the project titled “A pilot study on the epidemiology and health-related quality of life (HRQOL) of Sub-health in the Hong Kong Chinese population” HKU/HA HKW (UW 08-325).

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projects titled “Impact of Western medicine on the Development of Traditional Chinese Medicine” and “Agreement among Chinese medicine practitioners on Chinese medicine Body Constitutions of patients in primary care settings”. I treasured a lot this educational opportunity and was honored to be her first Ph.D student from mainland China.

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香港大學圖書館 HKU Libraries

Table of Content

Abstract iii

Declaration vi

Ethics Approval and Funding ix

Acknowledgements xi

List of Tables and Figures xxiv

List of Publications and Presentations xxvi

Abbreviations xxxi

Chapter 1 Introduction

1.1 Introduction 1

1.2 The concepts of Sub-health 4

1.3 Research Question, Aims and Objectives 17

1.4 Plan of Research 18

香港大學圖書館 HKU Libraries

Chapter 2 Sub-health (SH) and Health-related Quality of Life (HRQOL) - A Literature Review

2.1 Sub-health (SH) as an Intermediate Health State between Health and Disease 22

2.2 Sub-health (SH) in the Context of Chinese Medicine 25

2.2.1 Philosophy and Conceptualization of SH in Chinese Medicine 28

2.2.2 Body constitution and Sub-health 32

2.2.3 The relationship and differences between the concepts of Sub-health, subjective health perception, poor mental health, malingering, disease mongering, normal vicissitudes of life, tiredness and chronic fatigue syndrome 38

2.3 Measures of Sub-health 47

2.3.1 Symptoms diagnostic criteria for Sub-health 4

2.3.2 Rating scale assessment method for 4

香港大學圖書館 HKU Libraries

	Sub-health	
2.3.3	Physiological and Biochemical diagnosis method for Sub-health	50
2.3.4	Chinese Sub-health Questionnaire	51
2.4	Relationship between the concept of Sub-health/Well being and Health-related Quality of Life (HRQOL)	54
2.5	Summary	58

Chapter 3 Development and Content Validation of a Sub-health Questionnaire (SHQ)

3.1	Background and Aim of Study	62
3.2	Methods and Subjects	67
3.3	Results	77
3.4	Discussion and Summary	84

香港大學圖書館 HKU Libraries

Chapter 4 **Construct Validity and Psychometric Properties of the Sub-health Questionnaire (SHQ)**

4.1 Background and Aim of study 87

4.2 Methods and Subjects 88

4.2.1 Study design, setting and subjects 88

4.2.2 Data Analysis 92

4.3 Results 95

4.4 Discussion 102

4.5 Limitations 107

4.6 Conclusion 108

4.7 Summary 109

Chapter 5 **Prevalence, Risk Factors, HRQOL and Service Utilization of Sub-health in the Chinese General Population**

5.1 Introduction 1

香港大學圖書館 HKU Libraries

5.2	Aim and Objectives	113
5.3	Methods and Subjects	114
5.3.1	Sample size calculation	116
5.3.2	Response rate	116
5.3.3	Subjects	119
5.3.4	Data Collection and Study Instruments	123
5.3.5	Outcome Measures and Data Analysis	124
5.4	Results	128
5.4.1	Characteristics of Subjects	128
5.4.2	Prevalence of Sub-health	129
5.4.3	Risk Factors of Sub-health	129
5.4.4	HRQOL of people with Sub-health in cross-sectional study	132
5.4.5	Relationship between Sub-health, HRQOL and Health Services Utilization	136
5.4.6	Type of medical practitioners consulted	141
5.5	Discussions	15
5.5.1	Prevalence and Risk Factors of Sub-health	15

香港大學圖書館 HKU Libraries

5.5.2 HRQOL and Sub-health 152

5.5.3 Health Services Utilization associated with Sub-health and HRQOL 154

5.6 Limitations 156

5.7 Summary 159

Chapter 6 Relationship between Change in Health State (HS) and Change in Health-related Quality of Life (HRQOL)

6.1 Introduction 161

6.2 Aim and Objectives 163

6.3 Methods and Subjects 163

6.3.1 Response rate 163

6.3.2 Study Design, Setting and Subjects 165

6.3.3 Data Collection 1

6.3.4 Data Analysis 1

香港大學圖書館 HKU Libraries

6.4	Results	169
6.4.1	Characteristics of Subjects	169
6.4.2	Change in Health State over one year	173
6.4.3	Changes in HRQOL associated with changes in Health State	184
6.4.4	Changes in Health Service Utilization associated with Changes in Health State and HRQOL	187
6.5	Discussions	191
6.5.1	Relationship Between Change in Sub-health and Change in HRQOL	191
6.5.2	Clinical Important Difference (CID) of HRQOL Anchored on Change in Health State	194
6.5.3	Limitations	198
6.6	Summary	202

香港大學圖書館 HKU Libraries

Chapter 7 Conclusion and Recommendation

7.1 Key Findings 206

7.1.1 The Sub-health Questionnaire (SHQ) 206

7.1.2 Relationship between Sub-health and HRQOL 207

7.2 Implications of Results and Future Studies 212

References 215

Appendices 227

A. 8 Items Generated to Form Two Health State (HS) Scales (Health and Sub-health) before Cognitive Debriefing

B. The Second Draft SHQ consisting of 20 items grouped under 6 questions before Cognitive Debriefing

C. Information and Consent Form of Cognitive Debriefing Interview for SH study

D. Cognitive Debriefing Table for Evaluation Content Validity of the SHQ in Hong Kong

香港大學圖書館 HKU Libraries

E. Final SHQ

F. Initial Interview Questionnaire for SH study

G. Follow-up Interview Questionnaire for SH study (2-4 week retest assessment, 3,6,9,12-month follow ups assessment)

香港大學圖書館 HKU Libraries

List of Tables and Figures

Table 3-1	Characteristics of Subjects in Cognitive Debriefing	74
Table 3-2	CVI rating of SHQ items on clarity and relevance by 8 lay persons and 8 Chinese experts	79
Table 3-3	Items that required revision after cognitive debriefing	83
Table 4-1	Test-retest reliability and 3-month responsiveness of SHQ	97
Table 4-2	Correlations between SHQ item and SF-12v2 scale scores	99
Table 4-3	HRQOL Scores of SF-12v2 by Health States	101
Table 5-1	Numbers were grouped by contact status	118
Table 5-2	Sociodemographic characteristics of study sample compared to the Hong Kong General Population By-census (2006)	121
Table 5-3	Logistic regressions of SH on sociodemographics, excluding subjects with disease (n=515)	131
Table 5-4	Comparison of the SF-12v2 scores between SHQ groups and Hong Kong population norm (2008-2009)	134
Table 5-5	Persons who had consulted a doctor during the previous one month by SHQ groups	137
Table 5-6	Service Utilization Rates by type of Service and Sick Leave Rates by SHQ groups over the past 4-week one month	139
Table 5-7	Health service utilization rates of different SHQ health states	145
Table 5-8	Structured Multivariate Linear Regressions of SF-12v2 scores on health groups, controlling	147

香港大學圖書館 HKU Libraries

	for sociodemographics	
Table 5-9	Structured regression model for monthly total or acute consultation rates on health groups, controlling for sociodemographics	149
Table 6-1	Sociodemographic characteristics of study sample compared to the Hong Kong General Population By-census (2006)	171
Table 6-2	Change in health state with number and percent in every three months over one-year period*	174
Table 6-3	Subject counts (proportion) for trajectory pattern of the same subjects of each baseline health state group over 3,6,9 and 12 months (n=153)	176
Table 6-4	Change in health state with number and percent over at least 6 months in a one-year period*	182
Table 6-5	Mean changes (effect size) of HRQOL scores associated with the changes of health states over one year	186
Figure 1-1	Overlapping relationship between the different concepts	6
Figure 3-1	Theoretical Framework of Sub-health Questionnaire (SHQ)	69
Figure 4-1	Subjects were recruited for data analysis	91
Figure 5-1	Percentage distribution of consultations made during the past one month before interview by type of medical practitioners consulted for Sub-health	143
Figure 6-1	The percentage of respondents with health states classified by SHQ unchanged in every 3 months over one year	179
Figure 6-2	Among health states classified by SHQ, percent changed in every 3 months over one year period	180

香港大學圖書館 HKU Libraries

List of Publications and Presentations

Publications

HUANG Wenwei, Zhou Fusheng, Donald Bushnell et al. Cultural adaptation and application of the IBS-QOL in China: a disease-specific quality-of-life questionnaire. Quality of Life Research, 2007 Aug;16(6):991-6 (Listed BioMedLib- "Who is Publishing in My Domain?" (Top 20 Articles)，2007～2012 Top 1, updated on May 21, 2012).

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CLK Lam, KH Wong, ETP Lam, YC Lo, **HUANG Wenwei**,. Population Norm of Chinese (HK) SF-12 health survey version 2 of Chinese adults in Hong Kong. The Hong Kong Practitioner, June 2010.

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Cindy L. Lam, Elegance T. Lam, **HUANG Wenwei**, Validity and Equivalence of the SF-12v2 Health Survey for a Chinese Population (abstract). Quality of Life Research, ISOQOL 2009.

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HUANG Wenwei, Zhou Fusheng et al. The new research progress and thought about the pathogenesis of irritable bowel syndrome. Journal of Guangzhou University of Traditional Chinese Medicine, 2006.

Zhou Fusheng, **HUANG Wenwei**, et al. Review on Quality of Life Questionnaires for Irritable Bowel Syndrome. Advanced Studying Program on Piwei Syndrome by Integrative Chinese Medicine and Western Medicine in Guangdong, 2006.

HUANG Wenwei, Zhou Fusheng et al. The research progress and thought about the pathogenesis of irritable bowel syndrome. Journal of Traditional Chinese Medicine (Supplement), 2005.

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Conferences and Meetings

Oral presentation: Cultural adaptation and application of the IBS–QOL in China: a disease-specific quality-of-life questionnaire.
Event: Gastro-intestinal (GI) Section, 2006 International Society for Quality of Life Research conference
Date: October 10 - 14, 2006
Venue: Lisbon, Portugal
Invited GI Section Chairman, Being a member of 2006 ISOQOL conference Organizing Committee, Being a peer reviewer of 2006 ISOQOL conference, 2006 ISOQOL International Scholarship

Oral presentation: Validation of the Content of Sub-health Questionnaire by Cognitive Debriefing.
Conference on Quality of Life Research in Asia, 2010
Date: Dec 18, 2010
Venue: University of Hong Kong, Hong Kong
Invited Chinese Medicine Section Chairman: concurrent symposium 2B and free paper 1B

Oral presentation: Validation of the Content of Sub-health Questionnaire by Cognitive Debriefing.
Event: 東華三院王定一兩岸四地中醫藥研究生論壇暨治未病學術交流會
Date: February 7, 2009
Venue: Tung Wah Hospital, Hong Kong

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Oral presentation: The Development and Validation of a Sub-health Questionnaire (SHQ)
Conference on Quality of Life Research in Asia, 2010
Date: Dec 19, 2010
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Poster presentation: Development and Validation of a Sub-health Questionnaire (SHQ)
Event: 15th International Society for Quality of Life Research (ISOQOL) conference
Date: October 27-30, 2010
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Being a member of 2010 ISOQOL conference Program Committee, Clinical Research Theme, Event Planning subcommittee & Publicity subcommittee.
Being a peer reviewer of 2010 ISOQOL conference

Poster presentation: Development and Content Validation of a Sub-health Questionnaire (SHQ)
Event: 14th International Society for Quality of Life Research (ISOQOL) conference
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Poster presentation: Impact of chronic diseases on quality of life measured by the SF-12v2 Health Survey – comparison with the population norm in Hong Kong.
Event: 14th Medical Research Conference 2009
Date: January 10, 2009
Venue: The University of Hong Kong, Hong Kong

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Poster Abstract: Cultural adaptation and application of the IBS-QOL in China: a disease-specific quality-of-life questionnaire.
Event: Conference on Quality of Life Research in Asia, 2006
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Venue: Hong Kong Medical Academy, Hong Kong

Poster Abstract: Comparison of the Effects of Different Medical Therapies to Patients with Irritable Bowel Syndrome and Related Research on Quality of Life:
Event: Conference on Quality of Life Research in Asia, 2006
Date: May 19 - 21, 2006
Venue: Hong Kong Medical Academy, Hong Kong

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Abbreviations

BC	Body constitution
CID	Clinically important difference
CMSHQ	Chinese medicine Sub-health questionnaire
CVI	Content Validity Index
HRQOL	Health-related quality of life
HS	Health State
MCS	Mental Component Summary
MUS	Medically Unexplained Symptoms
PCS	Physical Component Summary
NYI	Not-yet-ill
QOL	Quality of Life
SF-12v2	Version 2 of 12-item Short Form Health Survey
SH	Sub-health
SHQ	Sub-health Questionnaire
TCM	Traditional Chinese Medicine
WHO	World Health Organization

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Chapter 1

Introduction

1.1 Introduction

The WHO defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (Murray 2002)”, which is an ideal state difficult to attain. Although advances in medicine and progression in new diagnostic technologies have led to considerable sensitivity in disease diagnosis, there are still a lot of clinical symptoms or problems that meet neither the full-health definition nor any disease criteria, resulting in repeated consultations and wastage of medical resources. It is recognized that many people without any disease do not have full health. The term “Not-yet-ill (未病)” (Callahan 1998), has been used in traditional Chinese medicine for thousands of years to describe an intermediate state between health and disease, and more recently it has been broadened to the concept of Sub-health (亞健康) (China Association of Chinese Medicine. 2006).

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The China Association on Chinese Medicine issued the "clinical guidelines on Sub-health" in 2006 to define Sub-health (SH) as symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease (China Association of Chinese Medicine. 2006). Fatigue, insomnia and pain were reported to be the three most common symptoms of SH (Juxian and Ying 2003; Hongyu and Ying 2004; Zhimin, Li et al. 2009). According to a survey reported by the China News Agency (Beijing), 75% of the Mainland Chinese population had SH, especially in large cities like Beijing and Shanghai (Wang 2005). It was estimated that about 60% Hong Kong population suffered from SH and most of them were in their 20 to 40s (Xie Yanming, Liu Baoyan et al. 2006; Liu Baoyan, He Liyun et al. 2007; Welfare 2010).

A similar concept of "non-disease" has been described in western medicine since 1960 (Meador 1965) as a clinically observable health conditions with no detectable disease (Smith 2002; Daschuk 2010). Many people consult doctors for symptoms, for which an organic pathology or disease cannot be identified and the term "medically unexplained symptom (MUS)" has been used to describe these conditions (Rosendal, Fink et al. 2007). It was reported that 15 to

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20% of the reasons for consultation in primary care were MUS (Hotopf, Mayou et al. 1998; Liu, Prince et al. 2002; Kirmayer, Groleau et al. 2004; Dirkzwager and Verhaak 2007).

There is a call from researchers and clinicians that better recognition and management of MUS and "non-disease" is needed (Smith 2002; Olde Hartman, Hassink-Franke et al. 2007). Symptom checklists have been used to detect MUS but there is still no consensus on the definition and diagnostic criteria of MUS (Smith 2002; Olde Hartman, Hassink-Franke et al. 2007).

The TCM Sub-health (SH) concept may help us understand the pathophysiology of MUS better because TCM has a long history of focusing on subjective perceptions, somatic symptoms and bodily dysfunctions instead of diseases.

The recognition of SH is important so that early intervention/ individualized "maintenance self-care plan" (e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿） and dietary supplement etc.) can be given to restore health. This is most

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relevant for primary health care that is intended to promote health and person-centered care instead of just treatment of diseases (WHO 2008). Modern medical services aim not only to treat diseases to prolong life, but also to enhance well being and health-related quality of life (HRQOL) (Lam and Lauder 2000). HRQOL should be used the most valid measure of the impact of SH and its treatments (Chen. 2009; Zhimin, Li et al. 2009).

1.2 The concepts of Sub-health

Based on the WHO health impact assessment (HIA) (WHO 2012), many determinants combine together to affect the health states of individuals and communities. To a large extent, factors such as 1) the social and economic environment, 2) the physical environment, and 3) the person's individual characteristics and behaviors all have considerable impacts on health, whereas the more commonly contribute to the complexity and transition of health states rather than there is simply one continuum: health-SH-disease. The context of people's lives determine their health and many common factors (like income and social status, education, physical environment, social support

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networks, genetics, health services, gender, age et al.) may influence the perception and transition of health. Conceptually, there is an overlapping relationship between the different concepts, as shown in the Figure 1-1 below:

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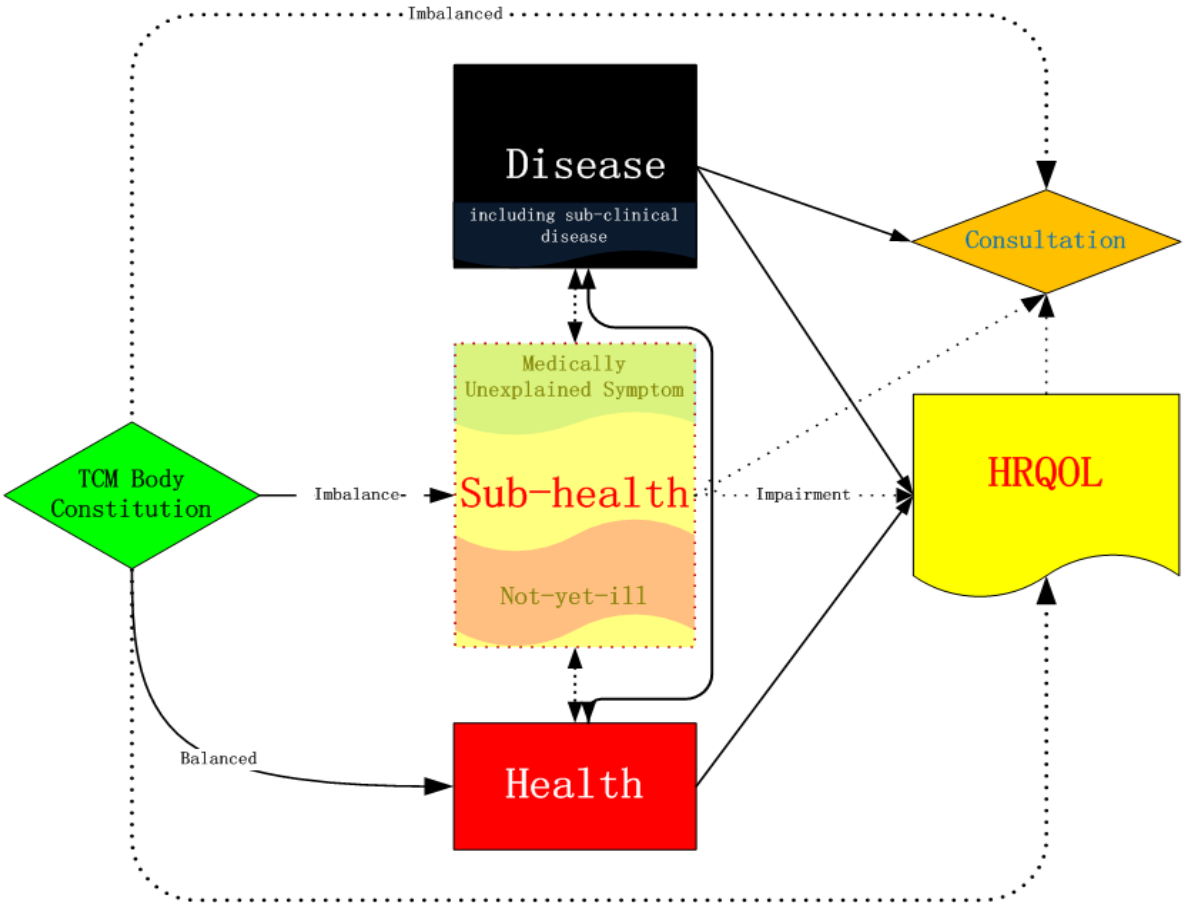
Figure 1-1 Overlapping relationship between the different concepts



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The concept of disease

The WHO's definition of health is a holistic multidimensional and inclusive standard. (Murray 2002). The quest for perfect health was regarded as a recipe for failure (Callahan 1998), which may affect our attitudes to disease and illness. Callahan (Callahan 1998) has suggested that "individual benefit is the only acceptable standard for providing health care". On the other extreme, disease has been defined slippery as a medical departure from normal structural or biological conditions of the body, which are associated with specific symptoms and signs, caused by external factors (Campbell, Scadding et al. 1979; Merriam-Webster 2007).

Diseases can be chronic or acute. Although there is no gold standard definition of chronic diseases, they usually refer to diseases that persist for a long period (e.g. 3 months) or being recurrent as defined by the U.S. National Center for Health Statistics (Daschuk 2010; Welfare 2010; WHO 2011). An acute disease can develop rapidly with intense symptoms and signs but last for only a short time. It should also be noted that some diseases, e.g. hypertension, may have no symptoms, and the term sub-clinical disease has been used to describe these conditions (Fletcher 1984; Merriam-Webster 2011).

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The concepts of Non-disease and Medically unexplained symptoms

However, it is recognized that many people without any disease do not have full health. This health state is commonly seen in clinical practice associated with somewhat impairment of HRQOL, so it cannot be neglected. The concept of SH should be differentiated from sub-clinical disease. It may be related to the concepts of "Not-yet-ill" (NYI) in TCM, and may manifest as non-disease and medically unexplained symptom (MUS) in western medicine.

The dilemma a doctor often faces is to differentiate illness and disease (Bateman 1996). "Non-disease" has been recognized in western medicine since 1965, which means that specific diseases are suspected but clinicians fail to discern (Meador 1965; Smith 2002; Wessely, Walsh et al. 2002). This notion is difficult to comprehend and is still not clearly defined. A survey among doctors on the top 20 non-diseases included ageing, bags under eyes and anxiety (Smith 2002). Many non-diseases are multiple symptoms that are often called medically unexplained symptom (MUS). The concept of "medically unexplained symptoms (MUS)", defined as symptoms or dysfunctions that lead the sufferer to seek clinical consultations but abide unexplained after proper medical assessments (Richardson and Engel Jr 2004). MUS accounts for 20-50% of all doctor consultations in primary care and

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some specialist outpatient clinics, but our knowledge of MUS is limited and the significance and management of MUS are still unclear (Olde Hartman, Hassink-Franke et al. 2007).

Differentiations between Sub-health and subclinical/asymptomatic disease

Sub-health is symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health (Fletcher 1984; China Association of Chinese Medicine. 2006). Sub-health stays below the threshold of objective detection by the usual clinical tests. It is distinct from a clinical disease. On the other hand, a sub-clinical disease represents asymptomatic and clinically silent condition (like hypothyroidism), which can be discovered if the patient undergoes medical tests (e.g. MRI, CT, X-rays or other investigations) (Merriam-Webster 2011).

The concept of Not-yet-ill in Traditional Chinese Medicine

Western medicine focuses more on objective signs by clinical testing in order to separate health and disease. TCM is a medical discipline based on clinical experience and is mainly guided by holistic concept through observing and analyzing the patient-reported information (Huihe 1992).

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When compared to western medicine, TCM has a more theoretically systematic understanding in terms of adaptive treatment and individualized treatment to subjective symptoms (Hui, Qi et al. 2010). The specific concept of “Not-yet-ill” (未病) is described in traditional Chinese medicine (TCM) to represent a state of reduced health condition when a person is not ill but is unhealthy (Rauch 1993; Tianfang Wang and Sun 2009). It is a concept for describing an intermediate state between full health and disease which has been developed since Warring States period (475-221 B.C.) (Callahan 1998). This concept infers preventive measures should be taken before the occurrence of disease. This has led to the development of the body constitution (體質) concept documented in the *Huangdi Neijing* (黃帝內經) (Callahan 1998) to describe the person’s physiological characteristics, including structural and functional characteristics, temperament, adaptability to environmental changes and susceptibility to disease (Alford 1972). Based on the TCM theory, the body constitution (BC) is highly significant in determining a person’s predisposition to certain illnesses (Merriam-Webster 2007).

BC is partly genetically determined but partly modifiable by the environment (Hedrick 2006; Wu, Cun et al. 2010). A number of studies

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were designed specifically to determine the connection of BC subtype and genetic variation in heterogeneous environments, similar to the balancing selection for maintaining polymorphism in natural populations (Naiying, Zheng et al. 2001; Chen, Lv et al. 2007; Qian, Zhou et al. 2007; Wang and Yao 2008; Wu, Cun et al. 2010). It can be broadly divided into balanced and imbalanced states (WHO 2007). People with BC imbalance may have SH although they are Not-yet-ill (NYI) (Zhimin, Li et al. 2009). SH may result from BC imbalance that leads to different symptoms or functional disturbance. Theoretically, TCM treatment of individualized to match the person's BC can promote health by restoring the imbalance.

The relationship between Sub-health, Not-yet-ill, body constitution and MUS

The China Association on Chinese Medicine issued the "clinical guidelines on Sub-health" in 2006 to define Sub-health (SH) as symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease (China Association of Chinese Medicine. 2006). A similar concept of "non-disease" has been described in western medicine since 1960 (Meador 1965) as a clinically observable health conditions with no detectable disease (Smith 2002; Daschuk 2010). Many people consult

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doctors for symptoms, for which an organic pathology or disease cannot be identified and the term “medically unexplained symptom (MUS)” has been used to describe these conditions (Rosendal, Fink et al. 2007). Symptom checklists have been used to detect MUS but there is still no consensus on the definition and diagnostic criteria of MUS (Smith 2002; Olde Hartman, Hassink-Franke et al. 2007). Based on the WHO health impact assessment (HIA) (WHO 2012), many determinants combine together to affect the health states of individuals and communities. To a large extent, factors such as 1) the social and economic environment, 2) the physical environment, and 3) the person’s individual characteristics and behaviors all have considerable impacts on health, whereas the more commonly contribute to the complexity and transition of health states rather than there is simply one continuum: health-SH-disease. The context of people’s lives determine their health and many common factors (like income and social status, education, physical environment, social support networks, genetics, health services, gender, age et al.) may influence the perception and transition of health. Conceptually, there is an overlapping relationship between the different concepts, as shown in the Figure 1-1.

“Not-yet-ill” (未病) is the TCM conceptual framework of Sub-health

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being an intermediate state between full health and disease (周寶寬 and 崔家鵬 2007). People with BC imbalance have Sub-health resulting in symptoms or dysfunctions although they do not have any detectable disease. The symptoms and dysfunction of SH can impair HRQOL, which may lead to help seeking through medical consultations and usages of other medical services (Zhimin, Li et al. 2009) (Dirkzwager and Verhaak 2007) (Chen. 2009).

The relationship and differences between the concepts of Sub-health, subjective health perception, poor mental health, malingering, disease mongering, normal vicissitudes of life, tiredness and chronic fatigue syndrome (discussed in Section 2.2.3 of Chapter 2)

Subjective health perception vs Sub-health

Both objective health status and its subjective health perception are the determinants of personal health status. The description of subjective perception of personal health status may or may not coherent with the objective health condition. That is to say, Subjective health perception may move in opposite direction with the objective health status, while the subjective health perception of SH individual is consistent with its objective status.

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Poor Mental Health vs Sub-health

Poor mental health problems are narrower than SH since it only focuses on mental or emotional discomfort like "feeling depressed/unhappy/sad". By contrast, SH is a "holistically low perceived health state of physical, mental and social well-being". This essentially means that the people with SH may or may not experience poor mental health. Also, SH largely relates to the health states of the general population but poor mental health focuses highly on reduced life expectancy and low work productivity which are more likely concerned with an individual or a small group of people.

Malingering vs Sub-health

Malingering is the act of pretend or exaggerate the physical or psychological symptoms/incapacity in order to avoid duty or work (Merriam-Webster 2012). Malingering person may feign physical or psychological illness for personal gain. It is often impossible for doctors to determine who is malingering (Rogers 2008), but the malingering person does not want to be cured. In a sense, malingering is fake and cannot be treated. However, people with SH generally report their factual low-perceived health condition in order to seek medical helps for health improvement.

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Disease mongering vs Sub-health

The diagnostic boundaries of illnesses are widen in order to expand markets for those who sell and deliver treatments, especially pharmaceutical companies are actively involved in sponsoring the making of new diseases in the pursuit of profits (Moynihan, Heath et al. 2002; Wolinsky 2005) (Moynihan 2003). Disease mongering can include turning ordinary illness into medical disease, emphasizing mild symptoms as serious, treating personal problems as medical, seeing risk factors as diseases, and citing the prevalence to maximize the potential markets (Moynihan 2011). However, Sub-health is an intermediate state between perfect health and disease (China Association of Chinese Medicine. 2006). People with SH generally self-report their factual low-perceived health condition in order to seek medical treatment and medication for health improvement.

Normal vicissitudes of life vs Sub-health

In the medical context, normal vicissitudes of life has consequences for people's health status (Weiner 1992; Pert 1997). Everyone must decide for themselves if what they are experiencing is just a normal part of life or serious medical problem (Smith 2002). The normal vicissitudes of life are not usually a clinically observable health conditions with no detectable disease. However, SH is an intermediate state between

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perfect health and disease (China Association of Chinese Medicine. 2006). People with SH generally self-report their factual low-perceived health condition in order to seek medical treatment and medication for health improvement. That is to say, SH is generally clinically observable health conditions, results in repeated consultations and wastage of medical resources.

Tiredness, Chronic fatigue syndrome vs Sub-health

Tiredness can be a symptom of many different diseases and conditions, rather than a symptom that defines any one particular disease. Most of the causes of tiredness are associated with fatigue (Fauci 2008). The primary symptom of CFS is medically unexplained fatigue and lasts for at least 6 consecutive months. The cause of CFS has not identified and there is no clinical test to diagnose CFS. However, SH is an intermediate state between perfect health and disease, concerned with three aspects (physical, psychological and social well-being) of a person's health conditions as "symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease (China Association of Chinese Medicine. 2006)". To some extent, people with SH may or may not have persistent profound tiredness.

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1.3 Investigation on Sub-health and Health-related Quality of Life

Research Questions

Over the last decades, the study of SH has attracted considerable interest following the description of the SH concept by the China Association on Chinese Medicine (China Association of Chinese Medicine. 2006). It may provide a theoretical base for the understanding of the pathophysiology of Not-yet-ill in TCM, as well as MUS and non-disease in western medicine. Furthermore, the impact of Sub-health on health-related quality of life deserves more attention because the latter is an important goal of health care, and a significant determinant of health service utilization.

What is the relationship between Sub-health and HRQOL? In order to answer the question, we have to be able to measure Sub-health reliably and validly in a standard procedure, and then evaluate the HRQOL of people with Sub-health.

Aims and objectives

The aim of this study was to establish the epidemiology of Sub-health and explore the relationship between SH and HRQOL. The study

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objectives are to:

1) Develop and validate a Sub-health questionnaire (SHQ) to identify people with Sub-health (SH);
2) Evaluate the HRQOL of people with SH;
3) Determine any difference in HRQOL between people with health, SH and disease;
4) Assess the change of HRQOL with change of health state;
5) Explore the relationship between SH, HRQOL and service utilization.

The results would be useful in a large number of general populations by cross-cultural adaptation worldwide to identify the SH epidemiology, provide evidence supporting the conceptual bases for SH in the Chinese medicine context, and manage the SH based on TCM BC classification.

1.4 Plan of Research

Two studies were conducted in Hong Kong in order to establish the epidemiology of Sub-health and the relationship between SH and HRQOL. The first study was to develop and validate a short Sub-health

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questionnaire (SHQ) for classifying people into Health, SH & Disease. The second was a longitudinal study on Chinese adults recruited from a general population survey to collect data to evaluate the validity and psychometric property of SHQ, to establish determine the epidemiology SH, and to explore the relationship between HRQOL of SH. The detailed research methodologies of the studies are presented in Chapters 3 to 7. The following is an overview of the work done.

Ⅰ. Development and content validation of a Sub-health Questionnaire

The standard 7-step method of development of a psychometric measure was used to develop the Sub-health Questionnaire (SHQ). Items to measure health and SH states were generated for a Health State (HS) scale base on a literature review expert panel selection. The Content Validity of each item of the HS scales were evaluated by cognitive debriefing with 8 experts and 8 layout persons. The interpretation and suggested rewordings by subjects in the cognitive debriefing were reviewed by an expert panel to identify items that were unclear or being misinterpreted, which were then revised to form the final HS scales. The two HS scales were combined with a module on doctor

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consultation and one on chronic morbidity to become the initial SHQ. The initial SHQ, was then field tested on a sample of 13 Chinese adults from the general population by telephone survey, which was further refined to the second version of SHQ. Pilot testing of the final version was conducted successfully on a convenience sample of 55 Chinese adults by telephone to confirm that it can be properly administered by interviewers without biases.

Ⅱ. Longitudinal study on Sub-health and HRQOL of general population

1231 Chinese adults were randomly selected from the general population by telephone survey with the SHQ, SF-12 Health Survey and a structured questionnaire on demographics and service utilization. 455 subjects agreed to have follow-up surveys at 2-4 weeks, and 3, 6, 9 and 12 months. Data of the 353 subjects who completed both base-line and 2-4 week interviews were used for the analysis on the validity, reliability and other psychometric properties of the HS scales.

The base-line data of all 1231 Chinese adults were used to determine the prevalence, risk factors of SH, HRQOL service utilization rates of

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patients with SH, The differences in HRQOL and service utilization rates between people with different health states were determined to investigate the clinical significance of SH.

The longitudinal data of 353 subjects who had completed 3 to 12 months follow up surveys to determine the change in health states and the associated change in HRQOL.

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Chapter 2

Sub-health (SH) and Health-related Quality of Life (HRQOL) - A Literature Review

This chapter first introduces the concept of Sub-health (SH) as an intermediate health state between health and disease. It then reviews the literature on the conceptualization of SH in TCM and the relationship between TCM body constitution and SH. The current measures of SH are discussed. The chapter ends with an overview of the relationship between SH and HRQOL. Relevant references were searched from electronic databases including MEDLINE, SPRINGER and Chinese CNKI database.

2.1 Sub-health (SH) as an Intermediate Health State between Health and Disease

Health states can be categorized into three basic conditions (1) Health; (2) Disease and (3) Sub-health (Manton 1988). However, the term Sub-health (SH) is difficult to define in quantitative method. It was

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summarized as “an intermediate health state between health and disease” by the China Association on Chinese Medicine in 2006 (China Association of Chinese Medicine. 2006). It defines SH as symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease and highlights its relationship with Traditional Chinese Medicine (TCM). This definition was adopted for the present research study because it is easy to understand, and it defines SH based on WHO health concept (張志強, 周賓賓 et al. 2011). From the perspective of Western medicine, it was first described as an intermediate health state in 1980s (Manton 1988) and was referred to as “the third health state” between health and disease (Manton 1988; Lili, Zhiwei et al. 2003; China Association of Chinese Medicine. 2006). However, the term “Sub-health” was not commonly used in the literature before 1980s. It was later considered to be similar to the TCM term “Not-yet-ill”, and has become more and more popular in the Chinese medical literature in the last decade (Lili, Zhiwei et al. 2003; 王育學 2005; Huaixi 2011; 張志強, 周賓賓 et al. 2011).

The objective of World Health Organization (WHO) is to pursuit “the attainment by all peoples of the highest possible level of health” (WHO

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1947). So the relationship between Sub-health and health-related quality of life (well-being) may be a potential holistic approach to explain health and provide fundamental evidence for health maintenance, consistent with the definition “health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” defined by WHO (Lam 2003).

The International Classification of Disease (ICD) is regarded as the standard diagnostic classification for general population published by WHO (WHO 2007). It is used to classify diseases and other health problems (WHO 2007). However, observed manifestations of SH in Western Medicine (non-disease and medically unexplained symptom (MUS)) were reported. Illness all relative as Geoffrey Rose has pointed out, “There is no disease that you either have or don’t have - except perhaps sudden death and rabies. All other disease you either have a little or a lot of” (Smith 2002). According to the literature, both layman and medical expert cannot reach a consensus on the concept of “a disease” largely because of its logically complex (Campbell, Scadding et al. 1979; Thagard 1996). Researches of the “non-disease” including MUS (Meador 1965; Smith 2002; Wessely, Walsh et al. 2002), were carried out in order to classify them into symptoms and entities (Olde Hartman, Hassink-Franke et al. 2007).

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2.2 Sub-health (SH) in the Context of Chinese Medicine

TCM has a long history of thousands of years in restoring health based on the person's perception of their own health status (Hui, Qi et al. 2010). In the Chinese medical texts, the perfect health state "陰平陽秘，精神乃治 (If the Yin and Yang energies of a man being kept in a state of equilibrium, his body will be strong and his spirit sound)" was documented in Sheng Qi Tong Tian Lun of *Huangdi Neijing* (黃帝內經-素問生氣通天論) (Wang 2000) to describe a normal state of Yin-Yang equilibrium. This normal state was also described as "平人者不病也 (People of four or five times of pulse beats in a respiration is called a normal person who has no disease)" in Ping Ren Qi Xiang Lun of *Huangdi Neijing* (黃帝內經-素問平人氣象論) (Wang 2000). This description is equivalent to the WHO "health" concept as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO 1947)."

Except "Healthcare/Maintain Life (養生/攝生)", "Not-yet-ill (未病)" is another important theory introduced as "是故聖人不治已病治未病，不治已亂治未亂，此之謂也。夫病已成而後藥之，亂已成而後治之，

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譬猶渴而穿井，鬥而鑄錐，不亦晚乎 (When a sage treats a patient, precaution is always emphasized, and often uses preventive measures in calming down the disturbances. If the disease is treated after it has already been formed, or try to calm down the disturbance after it has already taken shape, it will be too late, just like a dig a well until one is thirsty, or to cast the weapon after the war has already broken out.)”in Si Qi Tiao Shen Da Lun of *Huangdi Neijing* (黃帝內經-素問四氣調神大論篇). During the Tang dynasty, the famous TCM expert Sun Simiao (孫思邈) mentioned a similar statement as “古人善為醫者,上醫醫未病之病,中醫醫欲病之病,下醫醫已病之病,若不加以用心,於事混淆,即病者難以救矣”in a TCM classics “Beiji Qianjin Yao Fang (Essential Recipes for Emergent Use Worth A thousand Gold) (唐代《備急千金要方·論診候》)” (孙思邈 1999).

Although these ancient literatures does not fully explain the association between SH and NYI, they suggest us that SH may be a conceptual component of NYI. More specifically, NYI may be an early form of preventive Chinese medicine, which could be regarded as potential investigation on Sub-health.

Moreover, modern researchers Zhang Guangji (Guangji 2009) and

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Wang Tianfang (Tianfang and Tao 2009) explained the association of the SH with NYI with two arguments. First, the *Huangdi Neijing* emphasized the balance of yin-yang is NYI but SH is an imbalanced health state. Second, the scope of NYI is broad, which includes not only SH but other concepts such as healthy state. The problem with all these interpretations is, how should we define SH?

From an analysis of the modern Chinese literature, the earliest known Chinese medical reference to a "Sub-health（亞健康）" term was raised by Wang in 2002 (Yuxue 2002). After that, there were 5502 journal publications by keyword "Sub-health" in CNKI Chinese electronic database, but between1980 and 2001, only 167 related articles published in CNKI. The number of articles increased to a total of 5502 from 1980 to 2011 reflecting the increasing applications of Sub-health in medicine. As noted by most TCM researchers, title either "Sub-health" or "NYI" is recognized as a specific health entity to represent an unhealthy condition but still cannot meet any disease criteria in Western Medicine (Rauch 1993; WangTianfang and Tao 2009). There is potential for NYI to be used as a conceptually equivalent description for SH.

Hence the importance of the *Huangdi Neijing* as a source of ancient

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Chinese Sub-health history lies in its NYI theory since Warring States period (475-221 B.C.). It provides a starting point for understanding on difference and parallel between ancient and current Chinese medical understanding to SH. Such discussions on SH are essential to an appreciation of conceptualization of illness and health in Chinese medicine; it appear necessary in view of current medical attempts to structure the coexistence of Chinese and Western medicine as integrative path in the unending quest for human health.

2.2.1 Philosophy and Conceptualization of SH in Chinese Medicine

To discuss the Sub-health (SH) issue its underlying philosophy and conceptual base in the context of TCM must be defined. As discussed in the previous sections, ancient Chinese describes the concept of health as Not-yet-ill and Yin-Yang dynamic balance in the earliest classic on TCM, *Huangdi Neijing* "《黃帝內經》" (Wang 2000). Yin-Yang equilibrium implies a full health state and Yin-Yang imbalance represents SH, or in a sense, indicates disease (張慶祥 and 朱齊超 2003). Chinese medicine practitioners (CMP) can judge the symptom/problem due to efficiency or deficiency of Yin-Yang with the

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TCM four diagnostic methods (中醫四診法) that are “inspection”(望), “auscultation-olfaction”(聞), “inquiry”(問) and “palpation”(切) (Qinghong 2004). CMP can differentiate and treat the symptom/problem on the basis of an overall analysis of the individual health condition called “Bianzheng Lunzhi” (辨證論治) (Qinghong 2004). By this principle, Yin-Yang imbalance within the individual can be regulated and restored by TCM herbal medicine and/or Non-drug therapy.

Another basic concept of TCM is the “Holism (inspection of both the inner and outer)” (整體觀念), which refers to “the comprehensive consideration of human body (the inner) and the natural surrounding (the outer)”. It includes two aspects of health concept in TCM as “the human body as a whole” and “the unification of human body and surrounding”. The Holism concept in TCM emphasizes the importance of harmony relationship between human body with surrounding environment and also the transition from health to disease, which can be referred to *Huangdi Neijing* (《黃帝內經》素問·寶命全形論) described that:

“黃帝問曰：天覆地載，萬物悉備, 莫貴於人，人以天地之氣生，四時之法成，君王眾庶，盡慾全形，形之疾病，莫知其情，留淫日深，

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著與骨髓，心私慮之，餘慾針除其疾病，為之奈何？（《素問 寶命全形論》）(Yellow Emperor asked: Among all things between the heaven and earth, nothing is more precious than man. Man depends on the energies of heaven and earth to exist and grow along with the Law of the four seasons. All people, including Kings and common people, wish to have a healthy body, but occasionally, they feel a bit of unwell and neglect it, and the disease gradually accumulates and finally goes into hiding in the bone marrow which can hardly be removed. This is what I am worry about, and I wish to alleviate their pains with acupuncture, but how can I do it?) (Su Wen-Bao Ming Quan Xing Lun) (Following the Principle of Nature in Treating)".

The health concept in TCM is broad. Not only emphasize the importance of daily activities, physical functioning, emotion and diet, but also it deepens the perception of transition from health to disease. This concept coincides with the WHO health definition, as a conceptual base for Sub-heath. In maintaining health, *Huangdi Neijing* "《黃帝內經》" noted that:

"乃問於天師曰：餘聞上古之人，春秋皆度百歲，而動作不衰；今時之人，年半百而動作皆衰者，時世異耶? 人將失之耶? 岐伯對曰：上古之人，其知道者，發於陰陽，和於術數，食飲有節，起居有常，

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不妄作勞，故能形與神俱，而盡終其天年，度百歲乃去。今時之人不然也，以酒為漿，以妄為常，醉以入房，以欲竭其精，以耗散其真，不知持滿，不時禦神，務快其心，逆於生樂，起居無節，故半百而衰也。(Yellow Emperor asked the Taoist master Qibo, saying: “I am told the people in ancient times could all survive to more than one hundred years old, and they appeared to be quite healthy and strong in actions, but the people at present time are different, they are not so nimble in actions when they are only fifty, and what is the reason? Is it due to the change of spiritual principles or caused by the artificial behavior of men?” Qibo answered: “Those who knew the way of keeping a good health in ancient times always kept in their behavior in daily life in accordance with the nature. They followed the principle of Yin and Yang and kept in conformity with the art of prophecy based on the interaction of Yin and Yang. They were able to modulate their daily life in harmony with the way of recuperating the essence and vital energy, thus they could master and practice the way of preserving a good health a good health. Their behaviors in daily life were all kept in regular patterns such as their food and drink were of fixed quantity; their daily activities were all in regular times. They never overworked. In this way, they could maintain both in the body and in the spirit substantiality, and were able to live to the old age of more than one

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hundred years. But the people nowadays are quite different. They do not recuperate themselves according to the way of preserving a good health, but run in counter to it. They are addicted to drink without temperance, keeping idling as an ordinary, indulge in sexual pleasures and use of their vital energy and ruin their health. They do not protect their primordial energies carefully as handing a utensil full of valuable things. They don't understand the importance of saving their energy but waste them rashly by doing whatever to their liking. They know not the joy of keeping a good health and have no regular pattern of their daily food, drink and activities. Therefore, they become decrepit when they are only fifty.")".

2.2.2 Body constitution and Sub-health

As discussed above in 2.2.1, Chinese medicine practitioners (CMP) can assess the symptom/problem due to efficiency or deficiency of either Yin and Yang with the TCM four examinations (中醫四診法) (Qinghong 2004). The disease can be treated and the health may be reestablished individually based on the "Bianzheng Lunzhi" (辨證論治) (Xiaoning and Fangshi 2009), which is the comprehensive inspection

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of both the human body and surrounding. The Chinese Medicine Practitioner (CMP) usually makes an individualized prescription based on an overall assessment on individuals' health condition. Particularly, the Body Constitution (BC 體質) differentiation for the people is very significant in TCM.

The body constitution (BC 體質) concept derived from the NYI theory that was documented in the *Huangdi Neijing* (黃帝內經) (Callahan 1998; 王琦 2008), which includes structural and functional characteristics, temperament, adaptability to environmental changes and susceptibility to disease (Alford 1972). Based on the TCM theory, the body constitution (BC) is highly significant in determining a person's predisposition to certain illnesses (Merriam-Webster 2007). BC is partly genetically determined but partly modifiable by the environment.

A person's BC is unique. It can be broadly divided into balanced and imbalanced states (WHO 2007), either balanced type (neutral type 平和質) or imbalance types (Yin deficiency type 陰虛質, Yang deficiency type 陽虛質, Qi deficiency type 氣虛質, phlegm-damp

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type 痰濕質, damp-heat type 濕熱質, Qi stagnation type 氣鬱質, blood stasis type 血瘀質, specific allergic type 特禀質) (Qi 2005; Qi and Yanbo 2009; 楊志敏, 黃鸝 et al. 2009). In judging BC and preventing the occurrence of disease, *Huangdi Neijing* (黃帝內經) noted that：

“黃帝問於少師曰：餘聞人之生也，有剛有柔，有弱有強，有短有長，有陰有陽，願聞其方。少師答曰：陰中有陰，陽中有陽，審知陰陽，刺之有方。得病所始，刺之有理。謹度病端，與時相應。內合於五臟六腑，外合於筋骨皮膚。是故內有陰陽，外亦有陰陽。在內者，五臟為陰，六腑為陽，在外者，筋骨為陰，皮膚為陽。故曰，病在陰之陰者，刺陰之滎俞，病在陽之陽者，刺陽之合，病在陽之陰者，刺陰之經，病在陰之陽者，刺絡脈。故曰，病在陽者，名曰風，病在陰者，名曰痹，陰陽俱病，名曰風痹。病有形而不痛者，陽之類也；無形而痛者，陰之類也。無形而痛者，其陽完而陰傷之也。急治其陰，無攻其陽。有形而不痛者，其陰完而陽傷之也。急治其陽，無攻其陰。陰陽俱動，乍有形，乍無形，加以煩心，命曰陰勝其陽。此謂不表不裡，其形不久。 (《靈樞-壽夭剛柔》)

(Yellow Emperor asked Shaoshi:“I am told the human bodies are different in character: some are firm and some are soft; in constitution,

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some are strong and some are weak; in the type of build, some are tall and some are short; and some are of Yin and some are of Yang; I hope to know the reason.”Shaoshi answered: “There is Yin in Yang and there is Yang in Yin, when one knows the law of Yin and Yang and the mutual relation between them, he can treat the disease by pricking properly, know the initial condition of the disease and apply the pricking technique properly. In treating, one should also estimate the corresponding relation between the course of disease and the weather changes of the four seasons conscientiously. In human body, the Yin and Yang conform with the five solid and six hollow organs inside, and conform with the tendon, bone and skin outside. The five solid organs are Yin and the six hollow organs are Yang inside, the tendon and bone are Yin and the skin is Yang outside. So, when treating the disease of Yin in Yin, it should prick the Xing points on the Yin channel, when treating the disease of Yang in Yang, it should prick the He point of the Yang channel; when treating the disease of Yin in Yang, it should prick the Jing (River) point of the Yin channel; when treating the disease of Yang in Yin, it should prick the collateral points of the Yang channel. This is the fundamental rule of selecting the acupoints for pricking according to the relation between the disease and the internal and external Yin and Yang. The diseases can also be classified into Yin and Yang categories, when the disease is of the Yang channel, it is called

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wind, when it is of the Yin channel, it is called bi (disease) due to blocking of extremities, meridians and viscera by evils), when the disease is in both the Yin and Yang channels, it is called arthralgia due to wind-evil. When the disease has formal change but the patient has no pain, it belongs to the category of Yang channel, when the disease has no formal change but the patient is painful, it belongs to the category of Yin channel. When there is no formal change but the patient is painful, it shows only the Yin channel is injured, but the Yang is unharmed, so it should treat the acupoints on the Yin channel hastily by pricking, and the Yang channel must not be attacked. When there is formal change but the patient has no pain, it shows only the Yang channel in injured, but the Yin channel is unharmed, it should treat the acupoints on the acupoints on the Yang channel hastily, but the Yin channel must not be attacked. When the superficies and the interiors of both the Yin and Yang are diseased, the formal change appears all of a sudden and missing all of a sudden, and the patient is irritable, it is the so called Yin surpassing Yang and it is a disease of neither superficies nor interior which is hard to be cured. In this case, the physique of the patient can hardly exist long.”)” Ling Shu Shou Yao Gang Rou (On the Relation between Firmness and Softness of Body and One’s Life-span) (Wang 2000).

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Based on the TCM theory, the body constitution (BC) is highly significant in determining a person's predisposition to certain illnesses or implying the occurrence of disease (Wang 2000; Merriam-Webster 2007). The Body Constitution (BC 體質) differentiation for the people is very significant in TCM. The Chinese Medicine Practitioner (CMP) usually makes an individualized prescription based on an overall assessment on individuals' health condition. People with Sub-health generally can be classified into different imbalanced BC subtypes (岑澔 2007; 岑澔 and 王琦 2007; 王琦 2008; 楊志敏, 黃鸝 et al. 2009). Logically, BC may be taken as a latent indicator of SH. The SH concept implies the need of preventive measures (e.g. healthy diet, physical activity, *Qi Gong*（氣功導引）, non-smoking life, controlling alcohol consumption, stress management, access to TCM health care（中醫養生）facilities) may be taken before the occurrence of disease throughout classified people into balance and imbalanced BC (WHO 2007; 岑澔 and 王琦 2007; Haiwei 2009; Xiaoning and Fangshi 2009). People with BC imbalance have Sub-health resulting in symptoms or dysfunctions although they do not have any detectable disease (岑澔 and 王琦 2007; Zhimin, Li et al. 2009). SH also targets at enhancing the awareness of TCM scholars on the importance of BC

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classification in the context of TCM. According to the TCM theories, Chinese scholars such as Yang Zhiming (Zhimin, Li et al. 2009) and Su Yi-Chang (Yi-Chang 2008) have made invaluable contributions to the BC classification questionnaire BCQ-9 (in Putonghua) and BCQ-6 (in Taiwanese Hokkien) respectively. Although their question design is different, the content of questions and classification of BC is similar. However, there is still no official acknowledged standard for BC classification. Based on this literature review, we may conclude that 9-type BC system summaried by Wang Qi is well-known and frequently used in the SH studies to classify different BC types (Qi 2005; 岑澔 2007; 岑澔 and 王琦 2007; Qi and Yanbo 2009; Zhimin, Li et al. 2009; 楊志敏, 黃鸝 et al. 2009). Wang et al (Qi and Yanbo 2009) recruited 21,948 adults from 9 provinces of China to determine the epidemiology and distribution of BC subtypes in general Chinese population, also assessed the validity of the 9-type BC classification system.

2.2.3 The relationship and differences between the concepts of Sub-health, subjective health perception, poor mental health, malingering, disease mongering, normal vicissitudes of life,

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tiredness and chronic fatigue syndrome

As discussed above in Section 1.2 of Chapter 1, the SH is different from other well-documented states in western medicine, like subjective health perception, poor mental health (unhappiness/sadness), malingering, disease mongering, normal vicissitudes of life, tiredness and chronic fatigue syndrome.

Subjective health perception vs Sub-health

Both objective health status and its subjective health perception are the determinants of personal health status. Subjective health perception is self-reported satisfaction/expectations/complaints with health, which assesses against the objective determinant and associated with health care utilization (Filipkowski, Smyth et al. 2010). The description of subjective perception of personal health status may or may not coherent with the objective health condition. Even the healthy individuals may concern over modern health worries and report poorer health (mental and/or physical health) than their current health status (Filipkowski, Smyth et al. 2010), hampered the daily activities. That is to say, Subjective health perception may move in opposite direction with the objective health status, while the subjective health perception of SH individual is consistent with its objective status.

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Poor Mental Health vs Sub-health

Poor mental health problems are considered as an individual's inability to function, learn, work, or participate fully in daily life, which linked to reduced life expectancy. But generally they are not severe enough to be labeled by doctors as "disease", can still interfere with functioning across all areas of life. People who have poor mental health issues may also be sicker in physical health, associated with difficulties in sleeping, concentration and even suicide (Weitzman 2004). In pathology, a state of poor mental health may be diagnosed as mild psychological illness (like depression/anxiety). People with SH may stay in a state of feeling unwell or unhappy like poor mental health and life dissatisfaction, but it is unnecessary for everyone with SH to experience these emotional and mental discomfort. That is to say, people with SH may or may not stay in a state of poor mental health; while people with poor mental health may have SH, which depends on the clinical diagnosis. Sub-health is an intermediate state between perfect health and disease, concerned with three aspects (physical, psychological and social well-being) of a person's health conditions. On the other hand, poor mental health problems are concerned with "emotional and mental discomfort" which specified in particular mental/emotional/psychological aspect. Poor mental health problems are narrower than SH since it only focuses on mental or emotional

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discomfort like “feeling depressed”. By contrast, SH is a “holistically low perceived health state of physical, mental and social well-being”. This essentially means that the people with SH may or may not experience poor mental health. An alternative way to look at this relationship is by subdividing SH into physical SH subtype, mental SH subtype and social SH subtype. Also, SH largely relates to the health states of the general population but poor mental health focuses highly on reduced life expectancy and low work productivity which are more likely concerned with an individual or a small group of people.

Malingering vs Sub-health

Malingering is the act of pretend or exaggerate the physical or psychological symptoms/incapacity in order to avoid duty or work (Merriam-Webster 2012). People may feign physical or psychological illness for personal gain. Faked symptoms may vary and always be any way of getting the doctor to prescribe certain drugs, complaining of chronic pain from injury for insurance claims or lawsuits. People who malinger clearly have something tangible to gain and also appear to play the “sick” role, but for which objective tests such as MRI, CT, X-rays can find no physical cause. It is often impossible to determine who is malingering because it is a challenge to doctors (Rogers 2008). Doctors do not want to avoid a treatable disease, but the malingering

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person does not want to be cured if the symptoms are fakes. Malingering people fails to report any improvement with treatment, although the doctor may try many treatment without success. In a sense, malingering is fake and cannot be treated. However, people with SH generally report their factual low-perceived health condition in order to seek medical helps for health improvement. And early intervention/ individualized "maintenance self-care plan" (e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿） and dietary supplement etc.) can be used to handle SH problems.

Disease mongering vs Sub-health

In the medical context, disease mongering is described as telling healthy people they are sick, which is a challenge for everyone involved in healthcare (Dear and Webb 2007). The diagnostic boundaries of illnesses are widen in order to expand markets for those who sell and deliver treatments, especially pharmaceutical companies are actively involved in sponsoring the making of new diseases in the pursuit of profits (Moynihan, Heath et al. 2002; Wolinsky 2005) (Moynihan 2003). Disease mongering can include turning ordinary illness into medical disease, emphasizing mild symptoms as serious,

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treating personal problems as medical, seeing risk factors as diseases, and citing the prevalence to maximize the potential markets (Moynihan 2011). Actually a mild functional disorder may require little more than reassurance about its benign natural course (Wolinsky 2005). However, Sub-health is an intermediate state between perfect health and disease, concerned with three aspects (physical, psychological and social well-being) of a person's health conditions as "symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease (China Association of Chinese Medicine. 2006)". People with SH generally self-report their factual low-perceived health condition in order to seek medical treatment and medication for health improvement. And early intervention/ individualized "maintenance self-care plan" (e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿）and dietary supplement etc.) can be used to handle SH problems, rather than expand markets for those who sell and deliver treatments/medication.

<u>*Normal vicissitudes of life vs Sub-health*</u>

In the medical context, normal vicissitudes of life has consequences for

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people's health status (Weiner 1992; Pert 1997). Everyone must decide for themselves if what they are experiencing is just a normal part of life or serious medical problem (Smith 2002). Some medical sociologists and psychologists advocate that "good health is just as much a part of having a good attitude towards life as it is about having a physically fit body" (Smith and Moynihan 2002). In their eyes, health can even be defined as being successful in coping with pain, sickness and death as a normal vicissitude of life (Smith and Moynihan 2002). The normal vicissitudes of life are not usually a clinically observable health conditions with no detectable disease. However, SH is an intermediate state between perfect health and disease, concerned with three aspects (physical, psychological and social well-being) of a person's health conditions as "symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease (China Association of Chinese Medicine. 2006)". People with SH generally self-report their factual low-perceived health condition in order to seek medical treatment and medication for health improvement. That is to say, SH is generally clinically observable health conditions, results in repeated consultations and wastage of medical resources. And early intervention/ individualized "maintenance self-care plan" (e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal

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tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿）and dietary supplement etc.) can be used to handle SH problems.

Tiredness, Chronic fatigue syndrome vs Sub-health

Tiredness can be a symptom of many different diseases and conditions, rather than a symptom that defines any one particular disease. Medically, fatigue refers to a state of reduced capacity for mental or physical activity for a period. The lack of energy associated with fatigue can always cause tiredness. Most of the causes of tiredness are associated with fatigue (Fauci 2008). Chronic fatigue syndrome (CFS) is a debilitating and complex disorder characterized by persistent severe fatigue that is not improved by bed rest and that may be worsened by physical activity or mental exertion. CFS usually accompanied by weakness, muscle or joint pain, impaired memory and/or mental concentration, and insomnia, sore throat, tender lymph nodes, and headache unrelated to any preexisting medical condition. These symptoms should have persisted or recurred during 6 or more consecutive months of illness, and they cannot have first appeared before the fatigue. People with CFS often function at a substantially low level of daily activity and work (Chaudhuri, Majeed et al. 1997).

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The primary symptom of CFS is medically unexplained fatigue and lasts for at least 6 consecutive months. The cause of CFS has not identified and there is no clinical test to diagnose CFS. A clinician should consider a diagnosis of CFS if an individual meets three criteria below: a) has unexplained, persistent and severe fatigue for 6 months or longer that is not due to ongoing exertion, is not substantially relieved by rest, has begun recently (is not lifelong); b) the fatigue significantly interferes with daily activities and work; c) has at least 4 of the 8 symptoms of CFS: ①post-exertion malaise lasting more than 24 hours; ② unrefreshing sleep; ③ significant impairment of short-term memory or concentration; ④muscle pain; ⑤pain in the joints without swelling or redness; ⑥a sore throat that is frequent or recurring; ⑦tender lymph nodes in the neck or armpit; ⑧headaches of a new type, pattern, or severity. Currently, there is still no cure and CFS-specific drugs to manage the varied symptoms. An individualized treatment program that best meets the needs of the patient with CFS, based on a combination of therapies that address symptoms, coping techniques, and managing normal daily activities. However, SH is an intermediate state between perfect health and disease, concerned with three aspects (physical, psychological and social well-being) of a person's health conditions as "symptoms or suboptimal vitality leading

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to reduced functional and adaptive capacity relative to health without any detectable disease (China Association of Chinese Medicine. 2006)". To some extent, people with SH may or may not have persistent profound tiredness. That is to say, SH is generally clinically observable health conditions, results in repeated consultations and wastage of medical resources. And early intervention/individualized "maintenance self-care plan" (e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿）and dietary supplement etc.) can be used to handle SH problems.

2.3 Measures of Sub-health

In order to measure Sub-health, the concept must be clearly defined and outlined. During the past decades, several methods have been used in Sub-health investigation, mainly encompassing the following four areas (Xin, Jiaxu et al. 2011):

2.3.1 Symptoms diagnostic criteria for Sub-health

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Several Sub-health-specific diagnostic measures have been developed with Delphi methods in their study. Chen et al conducted a qualitative survey on medical specialists' understanding of diagnostic criteria (18-item symptom/problem/difficulty checklist) of Sub-health concluded that the enthusiasm, authority and harmony of specialty are good and their diagnostic standard of Sub-health (18-item checklist consists of 5 items on physical symptom, 6 on mental problem, 3 on vatility, 2 on social difficulty, 1 on immunity and 1 on medical consultation) with Delphi method can be used in epidemiology study (Chen, Wang et al. 2003). Two screening indicator systems for Sub-health were developed with Delphi method and proved effectively in quantization and evaluation method of Sub-health (Qi, Jinghong et al. 2006; Jun, Jinhua et al. 2010). A 38-item screening indicator of SH was established, which consists of general body systematic manifestations, somatic manifestations, work ability and quality of life (Qi, Jinghong et al. 2006). A 119-item screening indicator of SH was developed, which includes 40 items on physical facet, 41 items psychological facet, 35 items social facet and 3 items on general health (Jinhua 2010). Ye consulted clinical and epidemiological experts by modified Delphi method to assess the definition and diagnostic criteria of Sub-health successfully (Fang 2008).

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2.3.2 Rating scale assessment method for Sub-health

The concept of "Sub-health" in Chinese cultural contexts is important and suggests that disease and health is not an all-or-none classification. However, this may not convince people that Sub-health should be classified independently because this view is usually different from western-trained doctors.

The generic rating scales were used as a common standard tool for the assessment of the Sub-health. The Symptom Checklist 90 (SCL-90) was applied in China among frontier defense servicemen to assess the Sub-health by TCM practitioner judgment and finally more mental stresses are reported upon the servicemen with Sub-health (Yongguang, Yijun et al. 2005). Yang et al found that SCL-90 was an efficient measurement for diagnosis and severity assessment of Sub-health (Pingting, Zhijun et al. 2006). Zhao et al assessed the mental Sub-health with Cornell Medical Index (CMI) and found it statistically significant (Hong, Ping et al. 2008). Ma et al explored the risk factors affecting psychological Sub-health with CMI, Eysenck Personality Questionnaire (EPQ), Self-esteem Scale (SES) and Spheres of Control (SOC) (Haiying, Rong et al. 2006). They found that psychological Sub-health associated with the environmental, physical and

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sociopsychological factors in officers and soldiers in navy submarine units (Haiying, Rong et al. 2006). Zhang et al assessed the mental Sub-health condition of college students with CMI, SCL-90 and Self-rating Anxiety Scale (SAS) (張姝 and 郝善學 2009). Qiu used SAS and Self-rating Depression Scale (SDS) on Sub-health outpatients to assess their mental condition (邱彩花 2004). However, these scales are generic for well-being rather than for Sub-health specifically.

2.3.3 Physiological and Biochemical diagnosis method for Sub-health

Some researchers used modern physiological and biochemical diagnosis methods to assess Sub-health. Wang et al detected the Sub-health condition by Quantitative electroencephalography (QEEG) (Wang Dekun and Junli 2002). Electrocardiogram (ECG) was used to detect and assess the Sub-health with unrecognized heart problem (殷淑珍 1999; 李霞, 白净 et al. 2006). However, they are still not precise enough to detect Sub-health condition because Sub-health may be asymptomatic and no standard norm for clinical laboratory tests, even mismatched with Sub-clinical condition (吕敏, 師綠江 et al.

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2004).

2.3.4 Chinese Sub-health Questionnaire

Logically, international standard methods should also be applied to develop the Sub-health diagnostic questionnaires combined with clinical assessment and medical laboratory examination (Fang 2000; 賴世隆 and 郭新峰 2000; Lohr 2002; Yongyan, Baoyan et al. 2003; Zhengkun, Fengbin et al. 2011).

Several TCM-specific Sub-health measures have been developed. The TCM syndrome Questionnaire of Sub-health State "亞健康狀態中醫基本證候調查問卷" was developed and validated to measure Sub-health specific to the TCM syndrome by the TCM theory (Baoyan, Liyun et al. 2004; 何麗雲, 劉保延 et al. 2004; Baoyan, Yanming et al. 2006; Liu Baoyan, He Liyun et al. 2007). TCM inventory on Sub-health "亞健康狀態測評表" was developed with qualitative and quantitative methods based on "Sub-health TCM clinical guide" (Runru 2008). Zhao et al developed and validated a TCM syndrome questionnaire of Sub-health state "亞健康狀態中醫證候調查問卷" to

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evaluate Sub-health state by TCM syndrome concept (Hui, Jiaxu et al. 2011; Hui, Jiaxu et al. 2011). Xu et al developed and validated a Sub-health Measurement Scale “亞健康評定量表” to detect and assess people with Sub-health (Jinhua 2010). The Chinese Sub-health Evaluation Indicator System (SHMS) “亞健康評定指標體系” was developed to measure Sub-health (Jun, Liyi et al. 2011; Liyi, Jun et al. 2011). Xu developed and validated the Chinese Sub-health scale (CSHS) “中國人亞健康量表” for Chinese aged from 20 to 60 years old (Li 2008). Tao et al developed and validated a multidimensional Sub-health questionnaire of adolescents (MSQA) “青少年亞健康多維評定問卷” for adolescents in 2008 that consists of 71 items (32 items in “physical domains” and 39 items in “mental domains”). (Tao, Hu et al. 2008; Xing, Tao et al. 2008). Yan et al also developed and validated a Suboptimal Health Status Questionnaire (SHSQ-25) “亞健康狀態評價問卷” and established the cutoff points for the diagnosis of suboptimal health status (SHS) (Yuxiang, Jing et al. 2011). Wang et al developed and applied a 120-item health status questionnaire “健康狀態調查問卷”, together with a 24- “*zheng* (證)” form for TCM syndrome (“*zheng* (證)” in Chinese) evaluation by TCM practitioners (Ming 2012).

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These Chinese Sub-health measures may be relevant and sensitive for people with Suboptimal health status, but there is mismatch between TCM syndrome ("*zheng* (證)" in Chinese) and disease. Also, there is a fundamental difference between the concept of Sub-health and "*zheng* (證)". They may serve mainly the purpose of classifying symptoms into "*zheng* (證)" and does not capture the subjective evaluation of the impact on well-being from the symptoms or health problems. The results obtained by these Chinese Sub-health questionnaires are difficult to interpret without a clear distinction between the concepts of Sub-health, sub-clinical disease, disease and Chinese medicine Body Constitution subtypes (Liu Baoyan, He Liyun et al. 2007; Chen. 2009). They are TCM syndrome ("*zheng* (證)" in Chinese)-focused and may not differentiate between people with disease and those with SH because the exclusion criteria for disease is not clear enough (Liu Baoyan, He Liyun et al. 2007; Chen. 2009; Ming 2012). They also has the limitation of requiring the administration by a TCM practitioner (Liu Baoyan, He Liyun et al. 2007; Ming 2012). Thus, the current Chinese Sub-health measures served as a preliminary model for Sub-health diagnosis and assessment, but they may not really recognize Sub-health.

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The optimal measure for Sub-health state may combine the qualitative and quantitative methods mentioned above in 2.3.1-2.3.4 together as a diagnosis package “Subjective symptom rating scale assessment” and “objective medical examination with trained doctor’s diagnosis”. Therefore it is uncertain whether they can effectively detect and assess Sub-health. This had called for the development of standardized classification measure specific for Sub-health.

2.4 Relationship between the concept of Sub-health and Health-related Quality of Life (HRQOL)

Sub-health is a rapidly evolving field of research. In order to understand more clearly the intermediate health state between full health and disease as described by the WHO health concept, Sub-health must be identified easily and clearly. An area of attention has been in the relationship between Sub-health and HRQOL, as narrative by the literature review on numerous articles (範純武, 周剛 et al. 2006; 範純武, 周鋒 et al. 2008). However, current Sub-health measures may not diagnose Sub-health logically concise and unified because the estimated prevalence of Sub-health varied among 20-75% depends on

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different diagnostic criteria and healthcare setting.

The concept of Health-related Quality of life is broad and classified by multi-criteria evaluation, which shares the same dimensions in health. However, HRQOL reflects not only “overall quality of life”, but also can encompass physical or psychological functioning. These elements of physical or psychological HRQOL may or may not reflect health or well-being holistically. Medical researchers prefer to adopt HRQOL into Sub-health study in recent years.

Either Sub-health or HRQOL includes physical, psychological and social functioning/well being, subjective perception, and vitality. But not all subjects are ‘patients’ that appear ill; it is also suggested that HRQOL could mean person-reported outcome (Fayers and Machin 2007). Most HRQOL questionnaires focus on health status or well-being, which may encompass Sub-health (Fayers and Machin 2007). In a sense, the outcomes for HRQOL and those of Sub-health are comparable. A study by Fan et al published in 2008 discussed and explored the possible relationship between Sub-health and HRQOL (範純武, 周剛 et al. 2006; 範純武, 周鋒 et al. 2008). They pointed out that people with Sub-health may have statistically significant lower

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HRQOL scores than healthy subjects. The assessment of physical and psychological symptoms based on Sub-health subjects' subjective perception. Qi et al applied their expert panel's Sub-health criteria and recruited 726 adults with Sub-health and evaluated their HRQOL by WHOQOL-BREF measure, the results showed that person with Sub-health has impaired HRQOL (齊蘭芳, 王紅玉 et al. 2006). Also, Liu et al created a Sub-health questionnaire and assessed the HRQOL of 1134 college students by WHOQOL-BREF and found that Sub-health correlated with HRQOL impairment statistically significant in all domains (劉小娟, 楊思 et al. 2010).

Surveys have found that people with SH have a significantly lower HRQOL. A mainland China study of 1301 adults showed that 838 (69.7%) people diagnosed by CMSHQ to have SH had significantly lower quality of life scores measured by the SF-36 Health Survey compared with 199 (16.5%) healthy subjects (Zhimin, Li et al. 2009). Another study also found people with SH have similar impairment of HRQOL, suggesting a possible relationship between HRQOL and SH (Chen. 2009).

A Dutch study of 9963 patients using the SF-36 Health Survey showed

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that patients with persistent MUS had significantly lower HRQOL in all domain scores measured by the SF-36 Health Survey than non-MUS group (Dirkzwager and Verhaak 2007).

However, the exact relationship between Sub-health and HRQOL is still not clear because the Sub-health was measured by different methods in different studies. A standardized measure of Sub-health is needed in order to systematically examine the relationship between Sub-health and HRQOL was to inform us on how important Sub-health is, and what aspects of range may affect the most.

Another important measure of clinical significance is health service utilization. A recent health care cost analysis showed that 561 Sub-health subjects identified by self-made Sub-health questionnaire had consulted a clinical service (31%) or psychological counseling (57%) (Du Cen and Huiqing. 2003), placing a significant burden on the health care system. The impact of Sub-health on consultation, hospitalization and medication usage rates deserves more investigations. Such information is important to guide the estimation of the health service needs of the population.

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The studies listed above used different self-made questionnaires to diagnose Sub-health, which were supposedly to be valid and reliable. But those Sub-health questionnaires were not generally unified or easily administrated. To evaluate the relationship between HRQOL and Sub-health more scientifically, international standard HRQOL measures are suggested to be applied in Sub-health condition studies by standard methodology (Xin, Jiaxu et al. 2011).

Holistically HRQOL measures focus on physical, psychological and social well-being in order to show the magnitude of illness and the individual experience of illness or treatment (Bullinger 2002; Lohr 2002). However, the HRQOL instruments may not include some perspective Sub-health condition specific function like *Qi* deficiency (氣虛) based on TCM theory.

2.5 Summary

The literature on the concept of Sub-health is numerous but overlapping between the different concepts as below. The term "Not-yet-ill (未病)" (Callahan 1998) has been used in traditional

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Chinese medicine (TCM) to represent a state of reduced health condition when a person is not ill but is unhealthy (Rauch 1993; Tianfang Wang and Sun 2009). It is a concept for describing an intermediate state between full health and disease which has been developed since Warring States period (475-221 B.C.) (Callahan 1998). A similar concept of "non-disease" has been described in western medicine since 1960 (Meador 1965) as a clinically observable health conditions with no detectable disease (Smith 2002; Daschuk 2010). Many people consult doctors for symptoms, for which an organic pathology or disease cannot be identified and the term "medically unexplained symptom (MUS)" has been used to describe these conditions (Rosendal, Fink et al. 2007). Conceptually, Sub-health involves not only the TCM "Not-yet-ill" condition but also "non-disease" and MUS of Western medicine as well. To some extent that Sub-health may commonly manifest as subjective perception of ill health, somatic symptoms and bodily dysfunctions. Apart from the assessment of morbidities, physical and psychological symptoms should be included to assess their relationship with HRQOL domains. Therefore, conceptually the standard classification system could help professionals to categorize people with SH along with their HRQOL condition. To some extent, the TCM Sub-health (SH) concept may help us understand the pathophysiology of MUS better because TCM has a

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long history of focusing on subjective perceptions, somatic symptoms and bodily dysfunctions instead of diseases.

Sub-health supposedly imposes a huge burden on our healthcare service and affects our lives: physical functioning, psychological well-being and social functioning. All these aspects may contribute to impaired HRQOL. Worldwide recognized diagnosis and classification system of Sub-health are still unavailable and the magnitude of its influence on HRQOL is still limited. A wide variety of self-reported symptoms questionnaires and generic HRQOL measures were used in previous SH studies, which may not explained why the results varied considerably across different studies. Socio-demographic and socio-economic factors might also have an effect on SH. The relationship between HRQOL and SH could be independent, interrelated or reciprocal, which have not been fully explored. With a clear understanding of the relationship between SH and HRQOL, and their inter-relationship with service utilization, we could better manage people with Sub-health, and meet their health care needs.

There is some but still limited evidence reporting the association between Sub-health and Health-related Quality of Life. People who reported Sub-health are more likely to report HRQOL impairment.

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There are a number of studies available for showing that Sub-health people identified by the self-made Sub-health questionnaire/checklist have impaired HRQOL using international generic HRQOL instruments like SF-36, SCL-90 and WHOQOL-BREF. However, considerable difficulty still remains in diagnosing and classifying Sub-health easily and clearly. And the exact relationship between Sub-health and HRQOL is still complicated and unclear.

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Chapter 3

Development and Content Validation of a Sub-health Questionnaire (SHQ)

3.1 Background and Aim of Study

The WHO defines health as "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO 2010)", which is an ideal state difficult to attain. Sub-health (SH) is an intermediate state between health and disease defined as symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease. Surveys have supposedly suggested that Sub-health is very common but still no standardized diagnosis method for Sub-health. A 124-item Chinese medicine Sub-health questionnaire (CMSHQ) was developed by Liu et al.(Liu Baoyan, He Liyun et al. 2007) base on the traditional Chinese medicine (TCM) symptom-*zheng* classification (Liu Baoyan, He Liyun et al. 2007) but there is a fundamental difference between the concept of Sub-health and "*zheng*

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(證)". The CMSHQ serves mainly the purpose of classifying symptoms into "*zheng* (證)" and does not capture the subjective evaluation of the impact on well-being from the symptoms or health problems. The results obtained by the CMSHQ are difficult to interpret without a clear distinction between the concepts of Sub-health, sub-clinical disease, and Chinese medicine Body Constitution subtypes (Liu Baoyan, He Liyun et al. 2007; Chen. 2009). The CMSHQ also has the limitation of requiring the administration by a TCM practitioner (Liu Baoyan, He Liyun et al. 2007). And there is no consensus on Sub-health and nowadays people focus more on HRQOL instead of quantity of life.

In order to measure Sub-health, several methods have been used in Sub-health investigation during the past decades (Xin, Jiaxu et al. 2011) (discussed in 2.3.1-2.3.4 of Chapter 2). Several Sub-health-specific symptoms diagnostic measures have been developed with Delphi methods in their study (Chen, Wang et al. 2003; Qi, Jinghong et al. 2006; Fang 2008; Jinhua 2010). However, they are emphasizing on different TCM specialists' understanding and judgment on Sub-health to develop their own diagnostic standard of Sub-health. And these symptoms diagnostic criteria for Sub-health are not unanimous and may not easily use by WM practitioners because the

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symptom/problem/difficulty checklist are specific for TCM syndrome ("*zheng* (證)") differentiation. The generic rating scales were used as a common standard tool for the assessment of the Sub-health (邱彩花 2004; Yongguang, Yijun et al. 2005; Haiying, Rong et al. 2006; Pingting, Zhijun et al. 2006; Hong, Ping et al. 2008; 張姝 and 郝善學 2009). However, this may not convince WM practitioners that Sub-health is independently existing because these scales are generic for well-being rather than for Sub-health specifically. Some researchers used modern physiological and biochemical diagnosis methods to assess Sub-health (殷淑珍 1999; Wang Dekun and Junli 2002; 吕敏, 師綠江 et al. 2004; 李霞, 白净 et al. 2006). However, they are still not precise enough to detect Sub-health condition because Sub-health may be asymptomatic and no standard norm for clinical laboratory tests, even mismatched with Sub-clinical condition (吕敏, 師綠江 et al. 2004). Several Chinese TCM-specific Sub-health measures have been developed by recommended international standard methods combined with clinical assessment and medical laboratory examination (mentioned above in 2.3.4 of Chapter 2) (Fang 2000; 賴世隆 and 郭新峰 2000; Lohr 2002; Yongyan, Baoyan et al. 2003; Baoyan, Liyun et al. 2004; 何麗雲, 劉保延 et al. 2004; Baoyan, Yanming et al. 2006;

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Liu Baoyan, He Liyun et al. 2007; Li 2008; Runru 2008; Tao, Hu et al. 2008; Xing, Tao et al. 2008; Jinhua 2010; Hui, Jiaxu et al. 2011; Hui, Jiaxu et al. 2011; Jun, Liyi et al. 2011; Liyi, Jun et al. 2011; Yuxiang, Jing et al. 2011; Zhengkun, Fengbin et al. 2011). Those Chinese Sub-health measures may be relevant and sensitive for people with Suboptimal health status, but there is mismatch between TCM syndrome ("*zheng* (證)") and disease. Also, there is a fundamental difference between the concept of Sub-health and "*zheng* (證)". They may serve mainly the purpose of classifying symptoms into "*zheng* (證)" and does not capture the subjective evaluation of the impact on well-being from the symptoms or health problems. The results obtained by these Chinese Sub-health questionnaires are difficult to interpret without a clear distinction between the concepts of Sub-health, sub-clinical disease, disease and Chinese medicine Body Constitution subtypes (Liu Baoyan, He Liyun et al. 2007; Chen. 2009). They are TCM syndrome ("*zheng* (證)" in Chinese)-focused and may not differentiate between people with disease and those with SH because the exclusion criteria for disease is not clear enough (Liu Baoyan, He Liyun et al. 2007; Chen. 2009; Ming 2012). They also has the limitation of requiring the administration by a TCM practitioner (Liu Baoyan, He Liyun et al. 2007; Ming 2012). There is some but still

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limited evidence reporting that people with imbalanced TCM syndrome ("*zheng* (證)" in Chinese) are more likely to have Sub-health.Thus, the current Chinese Sub-health measures served as a preliminary model for Sub-health diagnosis and assessment, but they may not really recognize Sub-health clearly and exactly.

The recognition of Sub-health is important so that early intervention/ individualized "maintenance self-care plan" (e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿） and dietary supplement etc.) can be given to restore health if health service is to be truly intended to promote person-centered health instead of only disease focused treatments. However, no objective diagnostic method is currently available for Sub-health (Lombardo and Nezu 2005), so the identification relies on subjective reporting. For these reasons, we wanted to develop and validate a new diagnostic tool for Sub-health that could be used in epidemiologic studies and health promotion evaluation. The measure should be able to accurately detect people in the Sub-health state and easy to administer.

The background and significance of Sub-health have been described in

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previous chapters. The aim of this study was to develop a short diagnostic Sub-health Questionnaire (SHQ) to screen for Sub-health validly, reliably and efficiently.

This chapter presents the development and results of the evaluation of the content validity of a Sub-health questionnaire (SHQ). The objectives were to: 1) construct the SHQ, 2) evaluate the content validity of the Sub-health items.

3.2 Methods and Subjects

The methodology proposed by the Scientific Advisory Committee of the Medical Outcomes Trust (Lohr 2002) and a standardized procedure in the development and validation of a new measure (Lynn 1986) was adopted in the development and validation of the SHQ: (1) establishment of a framework for assessment that classified different health states (Health, Sub-health and Disease); (2) generation of items that measure the concepts of health, Sub-health and disease respectively; (3) development of the draft SHQ; (4) evaluation on face validity by an expert panel; (5) content validity evaluation by both lay persons and experts by cognitive debriefing; (6) refinement of the draft

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SHQ by an expert panel; and (7) pilot testing on the psychometric properties of the SHQ.

This chapter presents the results of the development and validation steps 1 to 6. The results of step 7 on pilot psychometric testing are described in Chapter 4.

Development of the SHQ (steps 1 to 4)

Items for the SHQ were developed from WHO health concept and literature review with 2 Health State (HS) Scales (Health scale and Sub-health scale).

Base on the WHO concept of health (WHO 1947), the concept of Sub-health (亞健康) (China Association of Chinese Medicine. 2006) and the U.S. National Center for Health Statistics definition of disease (chronic or acute) (Daschuk 2010; Welfare 2010; WHO 2011), a theoretical framework of different health states (Health, Sub-health & Disease) was established as shown in Figure 3-1.

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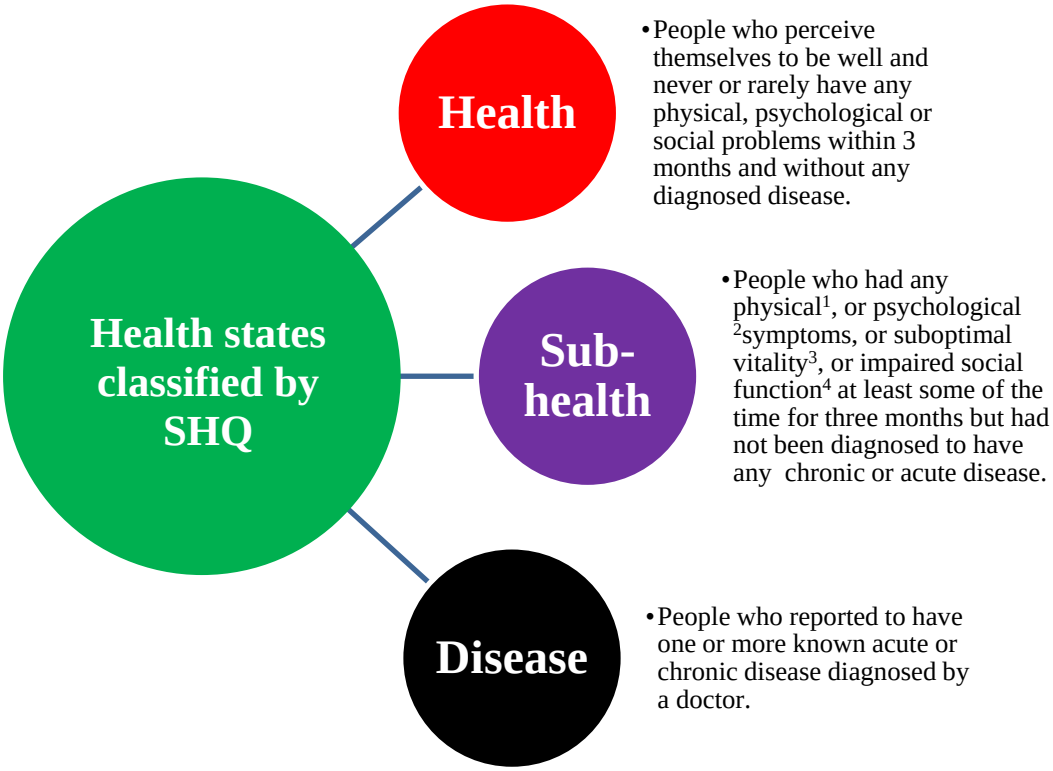
Figure 3-1 Theoretical Framework of Sub-health Questionnaire (SHQ).



[1] *'physical symptoms' = any physical symptom such as bodily pain, gastrointestinal discomfort, insomnia or headache, etc. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）*

[2] *'psychological symptoms' = Any emotional or psychological symptom such as feeling anxious, frightened, unhappy, depressed, or irritable, etc.*
任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）

[3] *'suboptimal vitality' = Feeling a lack of vitality such as easy fatigue, poor concentration, or slow in response, etc. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）*

[4] *'impaired social function' = Any difficulty in social interactions with family, friends, colleagues or other people. 與家人、朋友、同事或其他人的社交活動有任何困難*

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The items of SHQ are required to be the representation of the concepts of three health states (health, Sub-health, and disease). The author chose to represent the WHO health concept that most frequently included in widely-used health surveys (physical, social and role functioning, mental health, and general health perceptions) (Ware Jr and Sherbourne 1992) along with one additional problem that is strongly supported by Sub-health concept defined by the China Association of Chinese Medicine in 2006 (China Association of Chinese Medicine. 2006).

The China Association on Chinese Medicine group defined Sub-health (SH) as "*symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease*" (China Association of Chinese Medicine. 2006). The Sub-health scale was conceived to be such a screening tool specific to persons with the symptom/problem constellations of Sub-health and including the human concerns related to these symptoms of low perceived health.

The Sub-health survey can be shortened by the excluding disease criteria (acute or chronic disease). The common clinical acute are chronic diseases are used for disease screening, although there is no gold standard definition of chronic diseases. They usually refer to

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diseases that persist for a long period (e.g. 3 months) or being recurrent as defined by the U.S. National Center for Health Statistics (Daschuk 2010; Welfare 2010; WHO 2011). An acute disease can develop rapidly with intense symptoms and signs but last for only a short time. Items for the SHQ were developed from WHO health concept and literature review with 2 Health State (HS) Scales (Health scale and Sub-health scale).

The Health State (HS) Scale on Sub-health was constructed using this conceptual framework that distinguishes generally low perceived health perceptions, self-reported frequency in physical symptoms/psychological problems/suboptimal vitality/reduced social functioning and adaptive capacity and screening for commonly detectable diseases. While construction of Sub-health symptom frequency and bothersomness involve professional consensus of items to include, the definition and assessment of Sub-health condition is grounded in the "clinical guidelines on Sub-health" issued by the China Association on Chinese Medicine in 2006 (China Association of Chinese Medicine. 2006). Also, the development of perceived Sub-health scale must ground in previous studies reporting persons with Sub-health as closely as possible. This approach is similar to that developed by the Scientific Advisory Committee of the Medical

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Outcomes Trust (SAC-MOT 2002), also discussed in the FDA PRO Guidance (FDA 2009). The result is the SHQ survey described in this study.

As summarized in Appendix A, 8 items were generated to form two health state (HS) scales (health and Sub-health) from a literature review on the health concept, the Chinese medicine concept of Sub-health and "Not-yet-ill" (China Association of Chinese Medicine. 2006; Li Xueling, Han Ninglin et al. 2010) and medically unexplained symptoms (Lombardo and Nezu 2005) and diagnostic criteria of disease (Australian Institute of Health & Welfare 2010; WHO 2010). An expert focus group consisted of 6 western medicine doctors, 2 Chinese medicine practitioners and 3 HRQOL researchers evaluated the face validity of the first draft Sub-health items, revisions were made to the wording and lay out. The 8 items were grouped into two Health State (HS) scales, combined with a module on doctor consultation and a module on chronic morbidity to form the second draft SHQ, consisting of 20 items grouped under 6 questions (see Appendix B).

Cognitive Debriefing on Content Validity of the SHQ (steps 5 & 6)

The cognitive debriefing process commonly comprises of three steps. The first step is the collect consent from every subjects. The second

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step is to ask them to complete the SHQ and record the starting and end time. The third step is to collect comments from a small group of experts and/or target subjects by completing the cognitive debriefing table (see Appendix C & D).

A convenient sample of 8 lay persons Age ⩾ 18 years old who can read Chinese; in different age/sex groups were recruited from university students and patients of a primary care clinic in Hong Kong. Eight primary care doctors and HRQOL researchers were recruited as health experts. The characteristics of the subjects are shown in Table 3-1.

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Table 3-1 Characteristics of Subjects in Cognitive Debriefing

Characteristics	Lay persons (n=8)	Professional advisors (n=8)
Age (yr), Mean	41.4	32.1
± SD	17.4	9.55
Range of age (yr)	19-68	24-50
Men (%)	3 (37.5%)	3 (37.5%)
Education level (%)		
No formal school	-	-
Primary school	1 (12.5%)	-
Secondary school (including matriculation)	4 (50%)	-
University or above	3 (37.5%)	8 (100%)
Occupation (%)		
Associated Professionals/professionals	1 (12.5%)	8 (100%)
Skilled worker	2 (25%)	-
Semi-skilled workers	-	-
Housewife	3 (37.5%)	-
Students	2 (25%)	-
Retired/unemployed	-	-
Marital Status (%)		
Single	N.A.	N.A.
Married	N.A.	N.A.
Time to complete SHQ(min)	2.25	2.25

N.A.- data on marital status were not collected from subjects of cognitive debriefing study. Time for completion of questionnaire was not collected in the psychometric study.

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We evaluated the content validity of the eight items that form the two HS scales (Q1 *a* to *d* and Q2 *a* to *d* of the SHQ) by cognitive debriefing with experts and lay persons. The items (Q3 to Q5) on doctor consultations and those (Q6 *a* to *i*) on the presence of chronic disease are factual items that have been used in previous population surveys in Hong Kong, cognitive debriefing was not carried out on these questions (Lam, Fong et al. 2002; Lam, Tse et al. 2005; Lam C.L.K. 2008; Hong Kong SAR: Census and Statistics Department 2009).

The cognitive debriefing with each lay subject was conducted by individual face-to-face interviews with the answers recorded verbatim, while each expert answered the cognitive debriefing questions independently by self-completion. Each subject first completed the SHQ. He/she then gave general impression of the SHQ by responding to 4 questions:

1) Are the questions generally clear, easy to understand, easy to answer?

2) Overall, is the measure relevant to your situation? (Are the items meaningful and important to you?)

3) Are the instructions clear and easy to understand?

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4) Is the format easy to follow? (Is it easy to complete on your own?).

Finally, each item was rated individually by 5 structured questions as shown in the cognitive debriefing table in Appendix D.

Data analysis

The content validity index (CVI) on clarity and relevance were calculated as the proportion of respondents who endorsed the item as clear and relevant, respectively. The CVI of each of the eight HS items of the SHQ was calculated and the standard of 80% or above as proposed by Lynn et al. (Lynn 1986) was set to indicate good content validity. The CVI, a proportion agreement procedure, allows 8 lay persons and eight professional advisors to independently review and evaluate the clarity and relevance of the 8 items under two health state (HS) scales (health and Sub-health) (see Appendix A) to the domain of content represented in the SHQ. Based on Lynn et al.'s calculation for CVI, the proportion of cases in which the lay persons and professional advisors agreed and determined the stability of their agreement respectively (Lynn 1986). The responses like "relevant/very relevant", "clear/very clear", "yes/absolutely yes" and "agree/absolutely agree" of the content to the raters with the specific condition/item are considered to be "*content valid*," whereas responses like "not/somewhat relevant",

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“not clear/somewhat clear”,“no/absolutely no” and “disagree/somewhat disagree” are considered “*content invalid*” (Wynd, Schmidt et al. 2003) (Lynn 1986). Then responses were categorized into either “*content invalid*” or “*content invalid*” and the CVI became a proportion agreement as an index of interrater agreement about each item matches the content that item was developed to elicit.

The equation for CVI is:

$$CVI = \frac{number\ of\ raters\ making\ the\ comment\ "content\ valid"}{total\ number\ of\ raters} * 100\%$$

The interpretation and suggested rewordings by subjects in the cognitive debriefing were reviewed by the authors to identify items that were unclear or being misinterpreted, which were then revised to form the final SHQ for pilot psychometric testing. .

3.3 Results

Cognitive debriefing results

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Clarity of items

All lay persons and experts agreed in general the questions of the SHQ were clear, easy to understand and answer; the measure was relevant to their situation; the instructions were clear and easy to understand; and the format was easy to follow.

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Table 3-2 CVI rating of SHQ items on clarity and relevance by 8 lay persons and 8 Chinese experts

No. of SHQ	Items	CVI on clarity		CVI on relevance	
		Lay persons	Chinese Experts	Lay persons	Chinese Experts
Title:	亞健康問卷 (SHQ) (Sub-health Questionnaire (SHQ))	75%	75%	100%	75%
SHQ: Instruction Line 1	說明： 這項調查是詢問您的健康狀況和您日常生活的情況。(This survey asks about your health and how well you are able to do your usual activities.)	100%	100%	87.5%	87.5%
SHQ: Instruction Line 2	請回答下列每一個問題。問題並沒有對或錯的答案。(Please answer every question. There is no right or wrong answer.)	100%	100%	NA	NA
SHQ: Instruction Line 3	如果您對某一個問題不能做出肯定的回答，請按照您的理解選擇最合適的答案。(If you are unsure about how to answer a question, please give the best answer you can.)	100%	100%	NA	NA
SHQ: Q1	如果用下列的句子來形容您在過去四個星期裏的健康情況，您認為有多正確？(How TRUE or FALSE is <u>each</u> of the following statements in describing your health status <u>in the past four weeks</u>?)	100%	100%	100%	100%
SHQ: Q1a	a. 您的身體健康狀態良好 (a. Your physical health condition was good.)	100%	100%	100%	100%
SHQ: Q1b	b. 您的情緒和精神狀態良好 (b. Your mental and emotional condition was good.)	100%	100%	100%	100%
SHQ: Q1c	c. 您有充足的精力 (c. Your energy was good.)	100%	100%	100%	
SHQ: Q1d	d. 您在日常的社交活動裏表現良好 (d. You were able to carry out your usual social activities well.)	100%	100%	87.5%	

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SHQ:Response Options for Q1	肯定對(Definitely True) 大致對(Mostly True) 不知道(Not Sure) 大致不對(Mostly False) 肯定不對(Definitely false)	100%	100%	NA	NA
SHQ: Q2	2.在過去四個星期裏，您的日常工作或生活有多少時間會因為以下的問題而受到妨礙？ (How much of the time during the past 4 weeks have your daily function or activities been interfered by each of the following?)	100%	100%	100%	87.5%
SHQ: Q2a	a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等） (a. Any physical symptom such as bodily pain, gastrointestinal discomfort, insomnia or headache, etc.)	100%	100%	100%	100%
SHQ: Q2b	b. 任何情緒或精神問題(例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等） (b. Any emotional or psychological symptom such as feeling anxious, frightened, unhappy, depressed, or irritable, etc.)	100%	100%	100%	100%
SHQ: Q2c	c. 與家人、朋友、同事或其他人的社交活動有任何困難(c. Any difficulty in social interactions with family, friends, colleagues or other people.)	100%	100%	87.5%	87.5%
SHQ: Q2d	d. 感覺精力不足(例如容易疲勞、注意力不集中、反應遲鈍等） (d. Feeling a lack of vitality such as easy fatigue, poor concentration, or slow in response, etc.)	100%	100%	100%	100%
SHQ:Response Options for Q2	常常如此(All of the time) 大部分時間(Most of the time) 有時(Some of the time) 偶爾(A little of the time) 從來沒有(None of the time)	100%	89%	NA	NA

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Table 3-2 shows the CVI of each item of the SHQ evaluation by lay persons and experts. All items had CVI on clarity > 80% among both lay persons and experts except the title "亞健康問卷 (SHQ) (Sub-health Questionnaire)", which was rated by 75% only. All items had CVI on relevance > 80% among lay persons, and the CVI rated by experts on relevance were above 80% for all except the title "亞健康問卷 (Sub-health Questionnaire)" and item 1d "您在日常的社交活動裏表現良好 (You were able to carry out your usual social activities well.)" which had a CVI of 75% only.

Two lay persons and 2 experts misinterpreted the SHQ as "亞洲健康量表 (Asian Health Questionnaire)". The expert panel decided to add a definition of Sub-health to the introduction "亞健康是指人體處於健康和疾病之間的一種狀態 (Sub-health State is an intermediate state between health and disease)" in order to improve the clarity. The research panel decided to retain item 1d: "您在日常的社交活動裏表現良好 (You were able to carry out your usual social activities well)", because it is an important aspect of health although some Chinese people may not regard socialization important (Lam, Gandek et al. 1998).

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One lay person and 2 experts commented that it was a bit difficult to differentiate between the response options “有時 (Some of the time)” and “偶爾 (A little of the time)”. They were then revised into “間中 (Sometimes)” and “很少時間 (Seldom)” respectively in order to make it easier to differentiate between the options. The revisions to the SHQ items after cognitive debriefing are summarized in Table 3-3. The final SHQ is attached (see Appendix E).

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Table 3-3 Items that required revision after cognitive debriefing

Original Item	Items after revision	Comments
Title: 亞健康問卷 (SHQ) (Sub-health Questionnaire (SHQ))	亞健康問卷 (SHQ) 說明：亞健康是指人體處於健康和疾病之間的一種狀態。 (Sub-health Questionnaire (SHQ) INSTRUCTIONS: Sub-health State (SHS) is an intermediate state between health and disease.)	Five lay persons and 3 medical experts had difficulties in understanding this title. Two lay persons and 2 experts interpreted the SHQ as 亞洲健康量表 (Asian Health Questionnaire).
Response Options for Q2 常常如此 (All of the time); 大部分時間 (Most of the time); 有時 (Some of the time); 偶爾 (A little of the time); 從來沒有 (None of the time)	常常如此 (All of the time); 大部分時間 (Most of the time); 間中 (Sometimes); 很少時間 (Seldom); 從來沒有 (None of the time)	One lay person and 2 medical experts said it was a bit difficult to differentiate '有時' from '偶爾'.

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3.4 Discussion and Summary

The recognition of Sub-health is important so that early intervention/ individualized "maintenance self-care plan" can be given to restore health if health service is to be truly intended to promote person-centered health instead of only disease focused treatments. Furthermore, this is realistically feasible and cost-effective to develop the individualized "maintenance self-care plan" refers to the activities identified helpful for health and well being, e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿） and dietary supplement etc. However, no objective diagnostic method is currently available for Sub-health (Lombardo and Nezu 2005), so the identification relies on subjective reporting.

The Sub-health Questionnaire (SHQ), based on the WHO health definition and the TCM "Not-yet-ill" concept, was developed and shown to have sufficient content and construct validity and reliability as an instrument for classifying people into different health states. 8 items were generated to form two health state (HS) scales (health and Sub-health) from a literature review on the health concept, the Chinese

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medicine concept of Sub-health and “Not-yet-ill” (China Association of Chinese Medicine. 2006; Li Xueling, Han Ninglin et al. 2010) and medically unexplained symptoms (Lombardo and Nezu 2005) and diagnostic criteria of disease (Australian Institute of Health & Welfare 2010; WHO 2010). An expert focus group that consisted of 6 western medicine doctors, 2 Chinese medicine practitioners and 3 HRQOL researchers evaluated the face validity of the first draft SH items, revisions were made to the wording and lay out. The 8 items were grouped into two HS scales, combined with a module on doctor consultation and a module on chronic morbidity to form the second draft SHQ, consisting of 20 items grouped under 6 questions.

Sub-health is a latent construct that cannot be directly or objectively measured, because we hypothesized that Sub-health was a fugitive state that is poorly defined and lack of any objective features. It can only be inferred by the measurement of its observable indicators as reported by the person. It is essential that these indicators are valid for measuring Sub-health. Although it is a tedious process, cognitive debriefing is important to confirm that both experts and lay persons recognize the concept of Sub-health and that the indicators are clear and relevant.

In conclusion, the study indicated that the SHQ is conceptually valid

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with confirmed content validity. SHQ is now ready to be used for actual data collection to confirm its psychometric properties.

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Chapter 4

Construct Validity and Psychometric Properties of the Sub-health Questionnaire (SHQ)

4.1 Background and Aim of study

The background and significance of Sub-health have been described in previous chapters. The aim of this pilot study was to evaluate the construct validity and psychometric properties of the Sub-health Questionnaire (SHQ) for the screening of Sub-health.

The development and content validity of the Sub-health Questionnaire (SHQ) was confirmed by cognitive debriefing, as described in Chapter 3. As a diagnostic tool for Sub-health, SHQ needs to be valid, reliable and sensitive to be useful in classifying different health states as a diagnostic measure.

The objectives of this study were to: 1) evaluate the construct validity of the SHQ, 2) determine the reliability of the SHQ, and 3) test the

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sensitivity and responsiveness of the SHQ.

4.2 Methods and Subjects

The SHQ was constructed and validated using the methodology proposed by the Scientific Advisory Committee of the Medical Outcomes Trust (Lohr 2002) and a standardized procedure in the development and validation of a new measure (Lynn 1986), as described in Chapter 3.

4.2.1 Study design, setting and subjects

The pilot study aims at testing the validity of the questionnaire and to test the methodology and assumptions before the actual data collection begins. SSRC set a similar sample size of at least 50 completed interviews of randomly selected Hong Kong Chinese adults (aged 18 or above). All questions were tested during the pilot survey to ensure that all questions were understood by respondents, can be properly administered by interviewers and do not have any biases affecting the survey results. The cases obtained during pre-pilot study would not be

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included as part of the main survey report. This sample size was an estimation of HKU SSRC to previous researches in the same area but maybe under-powered. In addition, the validity of the SHQ was hopefully strengthened by enrolling a large sample size in the main cross-sectional study.

Pilot study on 55 Chinese adults conducted by SSRC

A pre-pilot study comprising 55 successfully completed interviews was conducted by SSRC on 17th and 18th March 2009. Ten interviewers participated in the pilot survey in the form of telephone interviews using the CATI system, calling from 4:00pm to 10:30pm. All interviewers studied the questionnaire instructions and completed a practice interview before making phone calls. The supervisor reviewed the interviews to see whether they are employing proper question-asking and probing techniques and conducting the interview in a professional manner. General problems were also noted and instructions were clarified for every interviewer.

Main study on 1231 Chinese adults conducted by SSRC

1231 Chinese adults were recruited randomly by SSRC from the general Chinese population in Hong Kong by telephone and all completed the baseline survey with the SHQ, the SF-12v2 Health

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Survey and a structured questionnaire on sociodemographic data, and health service utilization Among 1231 subjects recruited at baseline, 455 subjects agreed to have repeat surveys. 353 Chinese adults completed the SHQ, the SF-12v2 Health Survey and a structured questionnaire on health service utilization again at, 2 to 4 weeks and then 3 months. Data of the 353 subjects was used for final data analysis on validity and psychometric properties (see Figure 4-1). The demographic characteristics of the subjects who completed both baseline and follow-up surveys are shown in Table 3-1.

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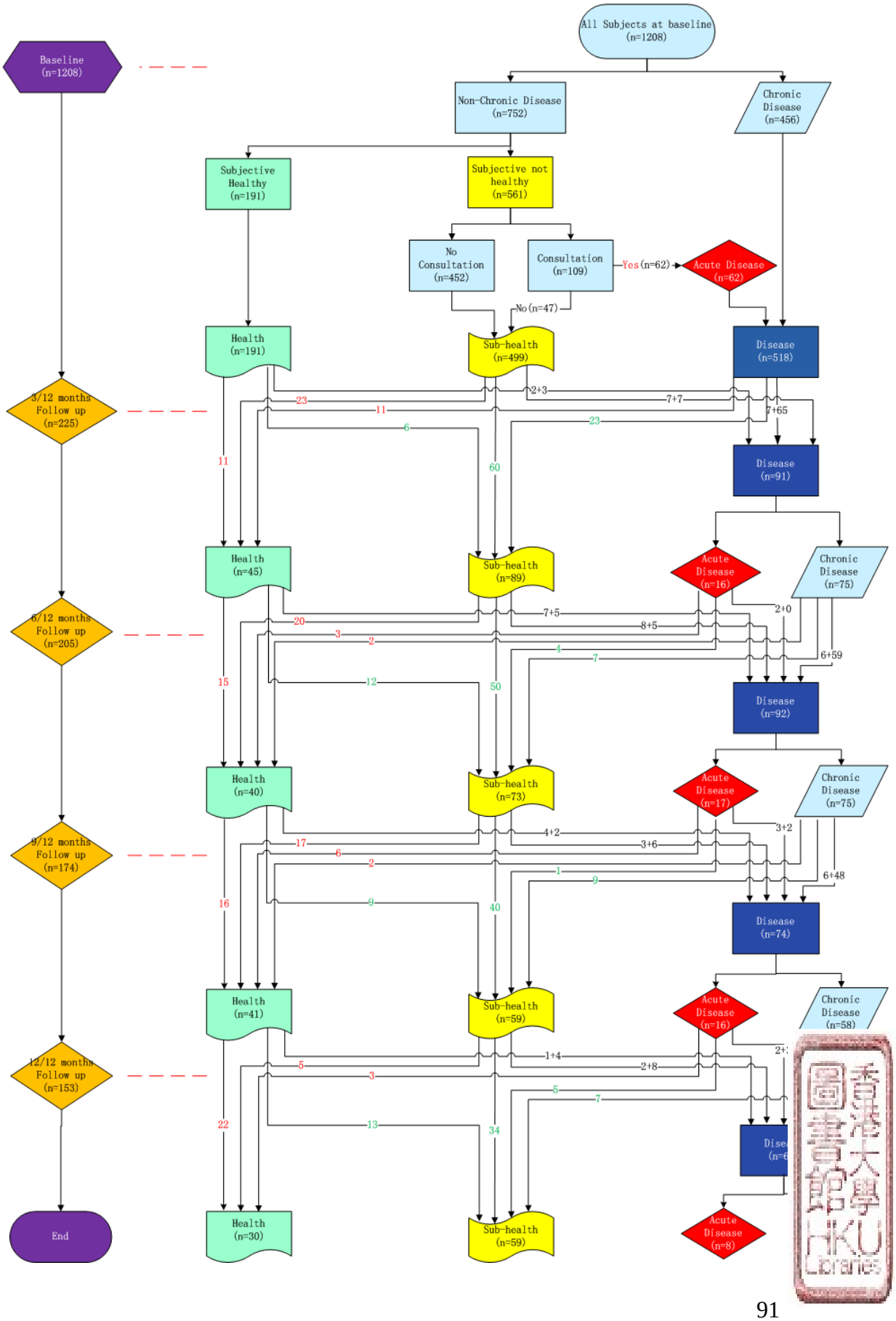
Figure 4-1 Subjects were recruited for data analysis



Pilot testing on psychometric properties

We recruited 455 subjects randomly from the general Chinese population in Hong Kong by telephone who agreed to have a baseline and repeat surveys. Psychometric testing by a longitudinal survey on 353 Chinese adults who completed the SHQ, the SF-12v2 Health Survey and a structured questionnaire on sociodemographic data, and health service utilization at baseline, 2 to 4 weeks and then 3 months. Data of the 353 subjects was used for final data analysis on validity and psychometric properties (discussed in Chapter 4). The demographic characteristics of the subjects who completed both baseline and retest surveys are shown in Table 3-1.

4.2.2 Data analysis

The analysis on psychometric properties were carried out by the SPSS 17.0 (SPSS. Statistical Package for the Social Sciences Base 17.0 User's Guide. USA).

Item coding and different caseness categories defined

The China Association on Chinese Medicine issued the 'clinical guidelines on Sub-health' in 2006 to define Sub-health (SH) as

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symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease (China Association of Chinese Medicine. 2006). Base on the WHO concept of health (WHO 1947), the concept of Sub-health (亞健康) (China Association of Chinese Medicine. 2006) and the U.S. National Center for Health Statistics definition of disease (chronic or acute) (Daschuk 2010; Welfare 2010; WHO 2011), Sub-health category was defined as people who had any physical, or psychological symptoms, or suboptimal vitality, or impaired social function at least some of the time for three months but had not been diagnosed to have any chronic or acute disease (see Figure 3-1).

The subjects were classified into 3 groups by the SHQ: 1) the Health group who reported no physical or psychological symptom or social limitations and without any diagnosed disease (response value to every item of question 1 < 3, every item of question 2 >3, question 3=2 and every item of question 6 >1); 2) the Sub-health group who had any physical, or psychological symptoms, or suboptimal vitality, or impaired social function for three or more months but had not been diagnosed to have any chronic or acute disease (response value to every item of question 6>1, any item of question 2 ≤ 3, and question 3

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⩾2 or question 4⩾2); and 3) the Disease group who reported any known acute or chronic disease diagnosed by a doctor (question 4=1 or any question 6=1). Test-retest reproducibility after 2 to 4 weeks of the health state classification by SHQ was examined by Cohen’s Kappa Coefficients (standard ⩾0.4) (Cantor 1996) (we assumed that HS classified by SHQ of each person would not change in a 2-4 weeks period).

The items of Q1a-d were recoded so that higher scores indicate healthier states. Cronbach’s alpha of the eight items of Each HS scale (Q1 and Q2) and in total was calculated to assess internal consistency (Cronbach 1951). An alpha of 0.70 or above was considered as good (Nunnally and Bernstein ; Cronbach 1951; Lohr 2002).

Analysis of psychometric properties

An item was hypothesized to correlate more strongly (convergent) or more weakly (discriminant) according to *a priori* expectations based on the content and theoretical relationship among constructs and what an item measured. Under the assumptions, we hypothesized that: a) physical HS item scores (Q1a, Q2a) should correlate significantly with the Physical Functioning, Role Physical and PCS summary score on the

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SF-12v2; b) psychological HS item scores (Q1b and Q2b) should correlate significantly with the Role Emotional, Mental Health and MCS summary score on the SF-12v2; c) vitality HS item scores (Q1c, Q2c) should correlate significantly the Vitality and MCS summary scores of the SF-12v2; and d) social HS item scores (Q1d, Q2d) should correlate significantly with the Social Functioning score of SF-12v2.

Construct validity was further assessed by known groups comparison. We hypothesized that the SF-12v2 PCS and MCS scores of the Sub-health group should be higher than those of the disease group but lower than those in the healthy group. The difference between groups was tested by the one-way ANOVA method.

The responsiveness of the SHQ was assessed by the proportion of subjects detected to have a change in the health state from the baseline to 3 months. The difference in the proportion of health states between the two time points was tested by *Chi-square* test for homogeneity of distributions.

4.3 Results

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Psychometric properties of SHQ

Reliability and Test-retest Reproducibility

Among the 353 subjects at baseline, 48 (13.6%) subjects were classified as healthy, 136 (38.5%) classified as having Sub-health, 146 (41.4%) were classified as having disease(s) and 23 (6.5%) could not be classified. 230 (70%) subjects were classified into the same health states on test-retest. The test-retest reliability of health state classification showed moderate agreement with an overall Cohen's Kappa of 0.572 (Table 4-1).

The eight HS items showed high internal consistency with a Cronbach's alpha of 0.82.

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Table 4-1 Test-retest reliability and 3-month responsiveness of SHQ

Health Categories classified by SHQ standard at baseline	2-4 week retest Health Categories				Kappa by group[a]
	Health	Sub-health	Disease	Total	
Health	**37 (77.1%)**	5 (10.4%)	6 (12.5%)	48	0.52
Sub-health	30 (22.1%)	**94 (69.1%)**	12 (8.8%)	136	0.52
Disease	8 (5.5%)	29 (19.9%)	**109 (74.6%)**	146	0.67
Total	75	128	127	330	-
Overall Kappa*			0.572		
Health Categories classified by SHQ standard at baseline	**3-month retest Health Categories**				**P value by Chi-square Tests[b]**
	Health	Sub-health	Disease	Total	
Health	11 (50.0%)	6 (27.3%)	5 (22.7%)	**22**	0.009
Sub-health	23 (23.7%)	60 (61.9%)	14 (14.4%)	**97**	
Disease	11 (10.4%)	23 (21.7%)	72 (67.9%)	**106**	
Total	**45**	**89**	**91**	225	

[a] *Cohen's Kappa is used to assess the SHQ diagnostic methods for different health categories (Health, Sub-health & Disease).*
[b] *0 cells (.0%) have expected count less than 5. The minimum expected count is 33.50.*

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Table 4-2 shows the Spearman correlations between SHQ item scores and SF-12v2 scores. Most HS items had significant and moderate (correlation coefficient around 0.4) with the relevant SF-12v2 scores as hypothesized. This would suggest that for the homogeneous (stationary) item-field correlations. The physical item (1a) did not correlate highly with SF-12v2 physical functioning but most highly with PCS. The social items (1d) did not correlate most highly with the SF-12v2 social functioning score but more with the SF-12v2 role-emotional score.

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Table 4-2 Correlations between SHQ item and SF-12v2 scale scores

	Spearman Correlation (r)									
	SF-12v2 domains								SF-12v2 Summaries	
SHQ	**PF**	**RP**	**BP**	**GH**	**VT**	**SF**	**RE**	**MH**	**PCS**	**MCS**
A-1a	0.274*	0.311*	0.367*	0.511*	0.320*	0.197*	0.153*	0.290*	0.448*	0.190*
A-1b	0.168*	0.255*	0.255*	0.319*	0.345*	0.262*	0.312*	0.433*	0.201*	0.380*
A-1c	0.221*	0.359*	0.353*	0.441*	0.421*	0.233*	0.317*	0.436*	0.354*	0.367*
A-1d	0.174*	0.259*	0.243*	0.256*	0.198*	0.227*	0.263*	0.262*	0.246*	0.228*
A-2a	0.301*	0.428*	0.425*	0.497*	0.345*	0.321*	0.307*	0.414*	0.441*	0.316*
A-2b	0.172*	0.377*	0.301*	0.339*	0.338*	0.389*	0.465*	0.511*	0.216*	0.483*
A-2c	0.188*	0.388*	0.350*	0.434*	0.411*	0.302*	0.426*	0.498*	0.263*	0.452*
A-2d	0.145*	0.331*	0.189*	0.282*	0.196*	0.338*	0.425*	0.304*	0.205*	0.362*

PF=physical functioning; RP=role-physical; BP=bodily pain; GH=general health; VT=vitality; SF=social functioning; RE=role emotional; MH=mental health; PCS=physical components score; MCS=mental components score.
Notes:
Spearman Correlations: strong ($r \geq 0.7$), moderate ($0.7 > r > 0.3$), and weak ($r \leq 0.3$).
** Statistically significant correlations ($p<0.01$)*
- Hypothesized correlations between SHQ item & SF-12v2 scores are highlighted (expected $r > 0.3$).

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Table 4-3 shows the SF-12v2 summary scores (PCS & MCS) by different health groups at baseline. As hypothesized, the PCS score of the Sub-health were intermediate between Health and Disease, but the MCS of Sub-health group was the lowest among three groups. The differences in SF-12 PCS and MCS scores between groups were statistically significant by one-way ANOVA.

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Table 4-3 HRQOL Scores of SF-12v2 by Health States

Baseline		SF-12v2-PCS[b,d]		SF-12v2-MCS[a,c,d]	
		Mean	**SD**	**Mean**	**SD**
HC	**Health group (n=43)**	55.11	4.01	56.80	5.53
	Sub-health group (n=139)	52.05	7.46	45.48	11.49
	Disease group (n=165)	42.91	12.18	48.93	11.52
2008 HK population (n=1350)		50.00	9.20	50.10	9.50

[a] *Statistical difference between Health & Sub-health groups by ANOVA, $p<0.01$.*
[b] *Statistical difference between Sub-health & Disease groups by ANOVA, $p<0.01$.*
[c] *Statistical difference between Sub-health & Disease groups by ANOVA, $p<0.05$.*
[d] *Statistical difference between Health & Disease groups by ANOVA, $p<0.01$.*

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Responsiveness to change

A total of 225 subjects completed the both baseline and 3-month follow-up surveys. 36.4% subjects showed a change in the health state measured by SHQ (see Table 4-1). The changes in the proportion in health states from baseline to 3-month reassessment was statistically significant (p=0.009), indicating SHQ is responsive to change.

4.4 Discussion

Sub-health is a latent construct that cannot be directly or objectively measured. It can only be inferred by the measurement of its observable indicators as reported by the person. It is essential that these indicators are relevant, important and effective for measuring Sub-health. Although it is a tedious process, cognitive debriefing is important to confirm that both experts and lay persons recognize the concept of Sub-health and that the indicators are clear and relevant.

As hypothesized, there were significant correlations between relevant HS item and SF-12v2 scores. The correlations were mostly moderate implying the HS scales and the SF-12v2 measure different although related concepts. It is interesting to note that the two SHQ items on

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social function had quite different correlations with the SF-12v2 social functioning score. The former on social well being (1-d: *You were able to carry out your usual social activities well*) had only weak correlation (0.227) but the latter on social problems (2-d: *Any difficulty in social interactions with family, friends, colleagues or other people*) had a moderate correlation (0.37). Both the SHQ 2-d and SF-12v2 social functioning item ask about limitations in social functioning but the SHQ 1-d asks about well being (*you were able to carry out your usual social activities well)*. The findings showed that positive and negative health are different concepts, the absence of problems does not always imply well being.

Exploratory factor analysis (EFA) is commonly used statistical method for construct validity assessment, which is used to uncover the underlying structure among sets of many interrelated variables (Norris and Lecavalier 2010). However, EFA does not appear to be relevant to the design of the SHQ which is used for classification of health status but not assessment.

Another interesting finding was that the SHQ item on social well being (1-d) has weak correlation with the SF-12v2 mental health (MH) score, while the SHQ item on social problems (2-d) correlated the most with

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the SF-12v2 role-emotional (RE) score, consistent with previous finding that social functioning (SF) is often affected by mental health (MH) (Lam, Tse et al. 2005).

The SHQ is intended to be used as an easy-to-use screening instrument to classify people into the health, Sub-health and disease states. This pilot study showed that 20-item questionnaire could be completed in less than 5 minutes by adults from all ages up to 89 years old. This is a great advantage in acceptability and feasibility over the long (124-item) Chinese Medicine Sub-health questionnaire (CMSHQ) used in previous studies (Liu Baoyan, He Liyun et al. 2007).

Our results demonstrated that the SHQ could be preliminarily considered valid and reliable for classifying over 90% of people into one of the three health, Sub-health and disease groups that had distinctly different quality of life (SF-12v2 scores).

An essential characteristic of a classification measure is reproducibility, which was also pretest and preliminary explored can for the SHQ with an statistically acceptable Cohen's Kappa. The test-retest agreement was only moderate probably because some people might have changed their health status over 2-4 weeks. The SHQ was also responsive to a

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change in the health state with time. These are important psychometric properties of a measure to be applied to epidemiological studies and clinical trials.

The SHQ is a generic health measure that could be applicable to different cultures and health settings, in contrast from the CMSHQ that is TCM specific. The SHQ will be most useful as a screening measure to identify people with Sub-health while the CMSHQ may be used to establish the syndrome-*zheng* (證) in the TCM setting.

More than one third (38.5%) of our subjects were classified as having Sub-health, which suggest many people in the general population have physical or psychological symptoms, suboptimal vitality, or impaired social functioning in at least some of the time for at least three months although they have not been found to have any chronic or acute disease. These findings validate the WHO's health concept and challenge the traditional medical focus on diseases. Studies by Huo et al (Yunhua 2007) in Mainland and Liang et al. (Xinghua 2009) in Hong Kong showed higher (65.1% and 84% respectively) prevalence of Sub-health. The difference in the prevalence may be the result of the use of different diagnostic criteria. A lower prevalence found in our study could be due to the exclusion of those diagnosed to have an acute

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disease.

One question is why is there a need to detect Sub-health even though it is common? A recent health care cost analysis showed that 561 subjects with Sub-health symptoms had consulted a clinical service (31%) or psychological counseling (57%) (Du Cen and Huiqing. 2003), which could place significant burden on the health care system. Our results showed that people with Sub-health had significantly lower quality of life than the healthy group. Their SF-12v2 mental component summary score (MCS) score was even lower than that of the disease group indicating significant mental stress. People can be worrying and depressing for their subjective symptoms, especially if the doctor find no cause to explain their health problem. The other possible explanation is that people with mental stress are more likely to perceive symptoms and problems (Kirmayer, Groleau et al. 2004). Yao et al assessed the relation between Sub-health and family environmental factors among 3320 university students in Bengbu city with the multidimensional Sub-health questionnaire of adolescents (MSQA) "青少年亞健康多維評定問卷" MSQA (Tao, Hu et al. 2008; Xing, Tao et al. 2008) and found that the prevalence of overall Sub-health state among students was 46.0% (30% categorized into physical Sub-health

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subtype and 36.5% categorized into mental Sub-health subtype, respectively) and the risk factors for Sub-health symptoms were single-parent family and lower health level of parents (Yao, Tao et al. 2010). They also found that university students with Sub-health reported physical inactivity, physiological dysfunction, immunity decline, emotional symptoms, behavioral symptoms and social adaptation problems (Yao, Tao et al. 2010). Their studies showed the supposedly conceptual and cross-cutting relationship between physical Sub-health and mental Sub-health (Yao, Tao et al. 2010). A mainland China study of 1301 adults also showed that 838 (69.7%) people diagnosed by CMSHQ to have Sub-health had significantly lower quality of life scores measured by the SF-36 Health Survey compared with 199 (16.5%) healthy subjects (Zhimin, Li et al. 2009). Another study also found people with imbalanced BC in 9 provinces of China have somewhat impairment of HRQOL, suggesting a possible relationship between HRQOL and Sub-health (Kefan. 2009).

4.5 Limitations

This telephone survey relied on the patients' subjective reporting of disease without objective validation by doctors. Some people classified

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as Sub-health could have a sub-clinical disease. Further studies comparing the SHQ classification against the doctor's diagnosis should be done to confirm the accuracy of the instrument.

4.6 Conclusion

The Sub-health Questionnaire (SHQ), base on the WHO health definition and the TCM "Not-yet-ill" concept, was shown to be acceptable and feasible for application to the general population. The construct validity and reliability of the SHQ for classifying people into different health states were confirmed. It is very easy to use with a potential application to large epidemiological studies. The SHQ can be used for evaluation of population health to inform health service needs. It can also be used for comparison of population health between countries, cultural groups, and over time. Our pilot data have shown significant impairment in the quality of life associated with Sub-health, the results on the natural history and impact on service utilization of SH will be described in the next two chapters. There is also a need for clinical trials to identify interventions that may be beneficial for Sub-health.

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4.7 Summary

The overall objective of this chapter was to confirm the validity and reliability of the Sub-health Questionnaire (SHQ) for classifying people to the Sub-health group among the general population. The psychometric properties of the SHQ have been shown to be adequate in discriminating health state groups and the two Health State (HS) Scales also satisfied the standards of the measurement model in internal consistency, construct validity and responsiveness. The results supported the application of the SHQ to investigate the impact of Sub-health on health-related quality of life, which are described in later chapters.

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Chapter 5

Prevalence, Risk Factors, HRQOL and Service Utilization of Sub-health in the Chinese General Population

5.1 Introduction

According to a survey by China News Agency (Beijing), 75% of the Chinese population did not have optimal health, especially in large cities like Beijing and Shanghai (Wang 2005). It was estimated that 56% Hong Kong population suffered from sub-optimal health and most of them were in their 20-40s (Xie Yanming, Liu Baoyan et al. 2006; Liu Baoyan, He Liyun et al. 2007; Welfare 2010). Among the 353 subjects who participated in both baseline and 2-4 weeks retest, 136 (38.5%) classified as having Sub-health. We noted that Sub-health was common associated with statistically significant HRQOL impairment. These results may suggest that disease and health is not an all-or-none classification (discussed in Chapter 4). The results presented in Chapter 4 suggest that Sub-health may be clinically relevant, which may challenge our persistence in disease-focused research.

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However, there is still some uncertainty on the differentiation between the three health states (Health, Sub-health and Disease) because of a lack of objective physiological or pathological indicators of health and Sub-health. The clinical significance of Sub-health is also not fully clear.

Health-related quality of life (HRQOL), based on the same WHO health concept as Sub-health, should be a valid outcome measure to evaluate the existence and significance of Sub-health. It gives an indication on whether Health-related quality of life (HRQOL), based on the same WHO health concept as Sub-health, should be a valid outcome measure to evaluate the existence and significance of Sub-health. It gives an indication on whether Sub-health is a distinct state from health or disease in terms of its impact on the person's life, which will then justify medical attention. Most studies were carried out in Mainland China with little data on the population in Hong Kong.

As a special administration region of China, the demographics and health situation of HKSAR is different from that of mainland China. The population of Hong Kong was estimated to be over 7 million; over 90% of people are Chinese and also Indonesian, Filipino and other populations (Department 2011). The population in Hong Kong is

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reflected an aging population than those in mainland. Free medical care is provided by Hong Kong public medical settings, which is very different in mainland China. People in mainland are requested to pay for total or partial health expenditure themselves. Hong Kong is a developed region with a highly efficient healthcare system but mainland China is a developing country with developing health outcomes for its population. TCM and WM contribute to the health service of the Hong Kong public separately, but in mainland China they are integrated together for public medical service. TCM accounts for a bigger contribution to the public medical service in mainland than that in HKSAR. However, Hong Kong has a high quality of health care and medical technology, and the morbidity in HKSAR is different from that in mainland China. The Centre for Health Protection (CHP) of Hong Kong serves as the government agency responsible for emergency service and management. And different people have different view on health/well being. So we expect groups with SH to differ in mainland China and Hong Kong SAR.

Another important measure of clinical significance of SH is health service utilization. The impact of Sub-health on consultation, hospitalization and medication usage rates is not fully known. Such information is important to guide the estimation of the health service

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needs of the population. Some studies conducted in Mainland China have reported the possible relationship between Sub-health and health service utilizations.

This Chapter presents the results of a cross-sectional study on the epidemiology, health-related quality of life (HRQOL) and the clinical significance of Sub-health (SH) in the Hong Kong Chinese population.

5.2 Aim and Objectives

The aim of this study is to determine the epidemiology and the clinical significance of Sub-health.

The objectives are

1) To determine the prevalence of Sub-health, and differentiate it from health and disease states among people in the general population;
2) To explore the risk factors of Sub-health in the Hong Kong Chinese adult population;
3) To evaluate any difference in HRQOL between the health, Sub-health and disease state;
4) To determine any difference in the service utilization rates between health, Sub-health and disease.

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To the best of our knowledge, this is the first study to systematically investigate the epidemiology and clinical significance of the Sub-health state in the population in Hong Kong. This research project builds on our previous research on population health, quality of life and service utilization to expand our knowledge on the transition from health to disease. The results can

1) provide evidence on the existence of Sub-health;

2) provide information on whether Sub-health is clinically important;

3) provide information on the health services needs of people with Sub-health;

4) give an estimate on the minimally clinical important difference (MCID) (Hays and Woolley 2000; Hays, Farivar et al. 2005; de Vet, Ostelo et al. 2007) in HRQOL anchored on the difference between the healthy and Sub-health state, and between Sub-health and disease state.

5.3 Methods and Subjects

This chapter presents the results of the baseline cross-sectional random telephone survey of the general adult (age 18 and above) Chinese population in Hong Kong in the period of Mar 17th, 2009-Aug 13th, 2009.

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SSRC set a similar sample size of at least 50 completed interviews of randomly selected Hong Kong Chinese adults (aged 18 or above). All questions were tested during the pilot survey to ensure that all questions were understood by respondents, can be properly administered by interviewers and did not have any biases affecting the survey results.

The cases obtained during pre-pilot study would not be included as part of the main survey report. This sample size was an estimation of HKU SSRC to previous researches in the same area but maybe under-powered. In addition, the validity of the SHQ was hopefully strengthened by enrolling a large sample size in the cross-sectional study.

Households in Hong Kong were be randomly selected by computerized random digital dialing, and the adult who firstly had the upcoming birthday were selected to answer the survey after verbal consent had been obtained. The interviews were conducted in either Cantonese or Putonghua. Non-Chinese households, commercial numbers, persons who cannot communicate and telephone numbers that were not answered after 3 callings will be excluded from the study.

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5.3.1 Sample size calculation

Previous studies found that MCID in HRQOL corresponded to an effect size difference of 0.3 to 0.5. A sample size of 176 per group is needed to detect an effect size difference of 0.3 by independent t test, with a power of 80% and a confidence interval of 95% (Florey 1993). Previous population surveys found 15% of people were healthy (Xie Yanming, Liu Baoyan et al. 2006), 38% suffered from chronic diseases (Lam, Lauder et al. 2003), and it is estimated that 30% may be classified as SHS. A sample size of 1173 is needed to include the required number of at least 176 in each group. 1200 subjects will be surveyed.

5.3.2 Response rate

A total of 16,703 telephone numbers randomly generated by the computer system were attempted, but 14835 had to be excluded because 7237 telephone numbers were not answered despite three attempts, there were no eligible subjects in 278 households, and 7320 were commercial or invalid numbers. There were 1868 eligible subjects but 453 refused to participate; 1415 subjects were surveyed and 1231

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completed the whole interview, giving a final response rate of 65.9% (1231/1868). These numbers are grouped by contact status as follows in Table 5-1:

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Table 5-1 Numbers were grouped by contact status

Type	Final status of contacts	Number of case
1	Success	1,231
2	Partial	184
3	Refusal	453
4	Fail to qualify	23
5	Business number	930
6	No Answer	7,237
7	Busy tone	276
8	Fax/Answering Machine	411
9	Invalid	5,703
10	Language	255
	Total	**16,703**

<u>Overall Response Rate</u>

= (success) / (success + refusals by targeted respondents + partial)

= 1,231 / (1,231 + 453 + 184)

= 65.9%

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5.3.3 Subjects

(see Figure 4-1)

Table 5-2 compares the sociodemographic characteristics of the subjects to that of the Hong Kong General Population 2006 By-census (Census & Statistics Department Hong Kong, 2006). The proportion of young adults was lower and that of the elderly was higher than those of the By-census. The proportion of males was lower and that of the females was higher than those of the By-census. The distribution in occupation of our subjects was not directly comparable to that of the By-census in that different classification methods of occupation were applied. We used the British Registrar General classification of occupation in order to indicate social class (General Registrar Office, 1966) instead of the International Standard Classification of Occupation used by By-census. The characteristics of the three groups of subjects at different time slots (baseline, 3-month, 12-month) are shown and compared to the Hong Kong general population (2006) in Table 6-1. Subjects had a wide range of age from 18 to 89 years old at the beginning or the longitudinal study and 18-77 years old when the whole study completed, and were generally old than the 2006 general population (mean age 46, 45 vs. 40 years). The sex distribution of our samples was more likely to be female, in comparison with the 2006

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Hong Kong general population. The educational level of our samples was more likely to be higher compared with the Hong Kong general population in 2006. The marital status of our samples was more likely to be married, in comparison with the Hong Kong general population. The income range of our samples was more likely to be higher compared with the Hong Kong general population.

Table 6-1 compares the sociodemographic characteristics of the sample in the longitudinal study to that of the Hong Kong General Population 2006 By-census (Census & Statistics Department Hong Kong, 2006). The proportion of young adults was lower and that of the elderly was higher than those of the By-census.

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Table 5-2 Sociodemographic characteristics of study sample compared to the Hong Kong General Population By-census (2006)

Characteristics	Subjects at baseline study	Hong Kong General population (2006)
N	1231	5722500
Age (yr), Mean	45.65	39.6 [a]
± SD	16.25	11.17
Range of age (yr)	18-89	18-85
Sex (%)		
Male	36.1	47.7[b]
Female	63.9	52.3
Education level (%)		
No formal school	3.2	7.1[c]
Primary school	15.4	18.3
Secondary school (including matriculation)	53.9	51.6
University or above	27.2	23.0
I don't know	0.3	-
Occupation (%)		
Associated Professionals/professionals	14.3	N.A.
Skilled worker	14.9	N.A.
Semi-skilled workers	18.7	N.A.
Housewife	20.3	N.A.
Students	8.9	N.A.
Retired/unemployed	20.6	N.A.
I don't know	2.3	N.A.
Marital Status, (%)		
Single	25.6	32.4[d]
Married	65.0	57.8
Widowed	4.1	6.0
Divorced/Separated	4.5	3.8
I don't know	0.8	-
Income range, n (%)		
< $5,000	11.4	10.9[e]
$5,000-10,000	14.2	17.7
$10,000-20,000	26.2	27.9
$20,000-30,000	16.6	17.4
$30,000-40,000	10.8	9.8
> $40,000	20.8	16.3

Note:
[a] *- Mean age was significantly different between the three groups by Chi-square test (p<0.05)*
[b] *- Sex was significantly different between the three groups by Chi-square test (p<0.05)*

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[c] *- Education level was significantly different between the three groups by Chi-square test ($p<0.05$)*
[d] *- Marital Status was significantly different between the three groups by Chi-square test ($p<0.05$)*
[e] *- Income range was significantly different between the four groups by Chi-square test ($p<0.05$)*
N. A. - No available information for comparison

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5.3.4 Data Collection and Study Instruments

The aim and plan of the study were explained and oral consent was obtained from each subject. Each subject answered a structured questionnaire (see Appendix F) that consists of three parts: 1) The Sub-health Questionnaire (SHQ); 2) The Chinese (Hong Kong) SF-12v2 Health Survey (ETP Lam, CLK Lam et al. 2008); 3) A questionnaire on sociodemographic data, chronic morbidity and health service utilization (Lam, Fong et al. 2002; Lam, Lauder et al. 2003). Service utilization was measured by self-reported monthly consultation rate (number of outpatient consultations with a registered medical practitioner in the past one month), and monthly hospitalization rate (any admission into the hospital in the past one month). Each subject was asked if he/she had ever been used any medications (medicine or treatment) over the past one month. Sociodemographic variables that were collected included age, gender, educational level, marital status, social class by occupation and income range (General Register Office 1966).

The SF-12v2 was chosen as the measure of HRQOL because it is commonly used and has been translated, validated and norm on our Chinese population (Lam, Gandek et al. 1998; Lam, Tse et al. 2005;

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Lam, Tse et al. 2005) (ETP Lam, CLK Lam et al. 2008);. The SF-12v2 is a subset of the SF-36 and the SF-12v2 physical and mental health summary measures are referred to as PCS-12 and MCS-12, respectively (Ware Jr, Kosinski et al. 1996). It has eight scales: physical functioning (PF), role limitation due to physical problems (RP), bodily pain (BP), general health (GH), vitality(VT), social functioning (SF), role limitation due to emotional problems (RE) and mental health (MH) (see Figure 5-1). Each scale has a score that ranges from zero to 100; a higher score indicates better HRQOL (Ware Jr, Kosinski et al. 1996).

5.3.5 Outcome Measures and Data Analysis

Primary outcomes

1) The prevalence of Sub-health, defined as the presence of physical, psychological symptoms or social difficulties that have affected a person's life at least some of the time for four weeks or more in the absence of any known chronic disease.

2) The SF-12v2 Health Survey scores of subjects of the Health, Sub-health and Disease groups.

Secondary outcomes

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Monthly rates of consultation, hospitalization, Accident & Emergency Department visit, use of medication and sick leave.

Data analysis

1) The subjects were classified into 3 groups: ① the Health group of people who report physical, psychological and social well-being and without any symptom or chronic disease ② the Sub-health group of people who had any symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease (China Association of Chinese Medicine. 2006); and ③ the Disease group of people reporting one or more chronic disease that has been diagnosed by a doctor for more than one month or acute disease that was recognized by a medical doctor;

2) The differences in the SF-12v2 scores between the groups were tested by independent *t* tests;

3) The difference in the monthly consultation, hospitalization, A&E visit, use of medication and sick leave rates between the three groups were tested by chi square tests;

4) The effect size difference in the SF-12v2 scores between the Health and Sub-health, and between the Sub-health and disease groups were estimated by the dividing the score difference by the standard deviation

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of the whole population, which were used as an estimate of the MCID of the SF-12v2 scales;

5) Multi-variable linear or logistic regressions were used to test the effect of Sub-health on SF-12v2 scores and monthly consultation, hospitalization, A&E visit, use of medication and sick leave rates, controlling for sociodemographic variables.

Statistical significance level is $P<0.05$. SPSS version 17.0 (SPSS. Statistical Package for the Social Sciences Base 17.0 User's Guide. USA) was be used for all statistical analyses.

We hypothesized that sociodemographic factors (age, sex, marital status, educational level, social class and family income) were possible determinants of Sub-health. Subjects with any disease were excluded from this analysis. Both healthy and Sub-health subjects were used as a dependent variable of health state. The independent variables were sociodemographic variables including age (1 = (18-39 yr) [reference level], 2 = (40-64 yr) and 3 = (≧65 yr)), sex (1 = male [reference level], 2 = female), marital status (1 = single [reference level], 2 = married, 3 = divorced and 4 = widower), educational level (1 = no schooling [reference level], 2 = primary, 3 = secondary and 4 = tertiary or above), social class (1 = managerial/administrative [reference level],

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2 = professional, 3 = employer, 4 = white-collar worker, 5 = blue-collar worker, 6 = service and sales worker, 7 = student, 8 = home-maker and 9 = retired/unemployed) and family income (1 = (< $5,000) [reference level], 2= ($5,000-10,000), 3 = ($10,000-20,000), 4 = ($20,000-30,000), 5 = ($30,000-40,000) and 6 = (> $40,000)).

All independent variables were entered into a logistic regression model to determine the independent effect of each factor on Sub-health state. We hypothesized that sociodemographic variables may have a sequential causal relationship with Sub-health.

Theoretically, a logistic regression model might result in confounded inference of sociodemographic variables and Sub-health. The difference in model R2 between the Sub-health and sociodemographic variables was calculated. Our hypothesis on a sequential causal relationship between sociodemography and Sub-health might be an over-simplified one, but the testing for more complicated causal or interactive relationships is beyond the scope of this study. The HS category consisted of Health and Sub-health (Health=0, Sub-health=1) was grouped under a hypothesis that probability of Sub-health will increase with female. We carried out the analysis for healthy and Sub-health subjects and by sex in order to see if there was any gender

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difference in the effects of possibility on Sub-health.

Multi-variable linear regressions of the difference in SF-12v2 scores or WM or TCM consultation rates on SHQ groups were carried out, controlling for socio-demographic variables, SHQ groups and other service utilization variables.

All data analyses were done by the SPSS-windows 17.0 (SPSS. Statistical Package for the Social Sciences Base 17.0 User's Guide. USA). Variable entry and exclusion criteria for the logistic regression model were p-values of 0.05. Subjects with unknown or missing data in any variable included in the model were excluded from the relevant regression analysis.

5.4 Results

5.4.1 Characteristics of Subjects

The characteristics of the three groups of subjects are shown and compared to the Hong Kong general population (2006) in Table 5-2.

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Subjects had a wide range of age from 18 to 89 years old, and were generally older than the 2006 general population (mean age 46, 45 vs. 40 years). The sex distribution of our samples was more likely to be female, in comparison with the 2006 Hong Kong general population. The educational level of our samples was more likely to be higher compared with the Hong Kong general population in 2006. The marital status of our samples was more likely to be married, in comparison with the Hong Kong general population. The income range of our samples was more likely to be higher compared with the Hong Kong general population.

5.4.2 Prevalence of Sub-health

Among the 1231 subjects at baseline, 188 (15.3%) subjects were classified as healthy, 484 (39.3%) classified as having Sub-health, 518 (42.1%) were classified as having disease(s) and 41 (3.3%) could not be classified.

5.4.3 Risk factors of Sub-health

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Table 5-3 shows the independent effects of sociodemographic variables on Sub-health state by logistic regressions. The result is an odds ratio of 1.94 (1/0.515), which suggests that females are 1.94 times more likely to have Sub-health than males. Subjects aged among 40-64 years old are less likely to have Sub-health than those aged among 18-39 years old. Subjects whose family income below $5,000 are more likely to have Sub-health.

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Table 5-3 Logistic regressions of SH on sociodemographics, excluding subjects with disease (n=515)

	Sub-health State			
	Coefficients[a]	Beta[b]	95% C.I.for EXP(B)[c]	P value
Age (year)				
Age (18-39) (n=249)				0.018
Age (40-64) (n=248)	0.478	-0.737	(0.277, 0.825)	0.008
Age (≥65) (n=18)	0.257	-1.358	(0.062, 1.069)	0.062
Sex				
Male (n=209)				
Female (n=306)	1.673	0.515	(1.007, 2.781)	0.047
Marital Status				
Single (n=313)				0.697
Married (n=174)	1.245	0.219	(0.636, 2.437)	0.522
Divorced (n=12)	4.054	1.400	(0.482, 34.097)	0.198
Widower (n=13)	1.486	0.396	(0.321, 6.872)	0.612
Educational Level				
Nil (n=6)				0.496
Primary (n=47)	0.36	-1.008	(0.03, 4.21)	0.419
Secondary (n=289)	0.28	-1.283	(0.03, 3.06)	0.295
Tertiary or above (n=173)	0.38	-0.962	(0.03, 4.38)	0.439
Social Class				
Managerial/administrative (n=12)				0.588
Professional (n=71)	0.57	-0.56	(0.13, 2.42)	0.448
Employer (n=13)	0.45	-0.79	(0.07, 2.79)	0.395
White-collar worker (n=103)	0.83	-0.19	(0.19, 3.64)	0.802
Blue-collar worker (n=58)	1.07	0.07	(0.22, 5.13)	0.930
Service and sales worker (n=59)	0.58	-0.54	(0.12, 2.76)	0.497
Student (n=63)	0.43	-0.85	(0.08, 2.16)	0.303
Home-maker (n=91)	0.46	-0.78	(0.10, 2.08)	0.313
Retired/unemployed (n=45)	0.51	-0.67	(0.10, 2.52)	0.408
Family Income				
< $5,000 (n=24)				0.07
$5,000-10,000 (n=70)	2.36	0.86	(0.66, 8.42)	0.19
$10,000-20,000 (n=159)	1.45	0.37	(0.46, 4.61)	0.53
$20,000-30,000 (n=84)	1.86	0.62	(0.52, 6.70)	0.34
$30,000-40,000 (n=54)	1.88	0.63	(0.47, 7.50)	0.37
> $40,000 (n=124)	0.79	-0.24	(0.23, 2.72)	0.71
Constant	11.878	2.475		.110
R2[d]		0.155		<0.001

Note: Nil means the variable was included in the model but p was >0.05.
[a] Unstandardised regression coefficients of variables that were included in the model with p-values < 0.05.
[b] Beta is the standardised regression coefficient, indicating the change in standard units of the dependent variable for each increase of one standard unit in the independent variable, controlling for all other independent variables.
[c] The odds ratio (EXP(B)) of variables that were included in the model with p-values < 0.05.
[d] R2 is the proportion of variance in the dependent variable explained by the independent variables included in the regression model.

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5.4.4 HRQOL of people with Sub-health in cross-sectional study

Table 5.4 shows the SF-12v2 scores of different health states classified by SHQ and the 2008-2009 Hong Kong population norm. The domain and summary scores were compared between SHQ groups by one-way ANOVA. It shows the SF-12v2 summary scores (PCS & MCS) by different health groups. The PCS score of the Sub-health were intermediate between Health and Disease, but the MCS of Sub-health group was the lowest among three groups. The differences in SF-12 PCS and MCS scores between groups were statistically significant by one-way ANOVA. As hypothesized, the SF-12v2 domain scores of Sub-health group should be higher than those of disease group but lower scores than those of health group, which was confirmed by the results of all but the MCS scales. The difference between groups was tested by the one-way ANOVA method in order to check the significant difference. The p values of statistical significance between Sub-health and Health is lower than 0.05 (even <0.01) in all domain and summary scores (PF, RP, BP, GH, VT, SF, RE, MH, PCS-12 and MCS-12). And the difference was statistically significant between Sub-health and Disease in 5 domain and summary scores (PF, RP, BP, GH, VT, PCS-12 and MCS-12). No statistical significant difference was found between Sub-health and Disease in the SF-12v2 domain (SF,

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RE and MH) scores.

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Table 5-4 Comparison of the SF-12v2 scores between SHQ groups and Hong Kong population norm (2008-2009)

SF-12v2	Groups	N	Mean	SD	95% CI	ANOVA Sig. between SHQ groups*
PF	Health	182	97.12	8.83	(95.82, 98.41)	<0.001[acf]
	Sub-health	479	92.07	17.18	(90.52, 93.61)	
	Disease	535	80.65	27.32	(78.33, 82.97)	
	Total	1196	87.73	22.51	(86.45, 89.01)	
	HK population norm	2533	87.30	22.40	(86.40, 88.20)	
RP	Health	182	94.92	10.99	(93.31, 96.52)	<0.001[ace]
	Sub-health	478	84.70	17.76	(83.11, 86.30)	
	Disease	533	75.52	25.23	(73.37, 77.66)	
	Total	1193	82.16	21.81	(80.92, 83.40)	
	HK population norm	2533	79.80	22.80	(78.90, 80.70)	
BP	Health	182	95.74	9.42	(94.36, 97.12)	<0.001[ace]
	Sub-health	482	85.84	19.15	(84.13, 87.55)	
	Disease	539	76.58	26.22	(74.36, 78.80)	
	Total	1203	83.19	22.68	(81.91, 84.47)	
	HK population norm	2533	77.60	25.00	(76.60, 78.60)	
GH	Health	182	75.05	20.27	(72.09, 78.02)	<0.001[ace]
	Sub-health	482	52.51	25.48	(50.23, 54.79)	
	Disease	540	40.56	27.10	(38.26, 42.85)	
	Total	1204	50.56	28.07	(48.97, 52.14)	
	HK population norm	2533	47.80	27.80	(46.80, 48.90)	
VT	Health	182	80.49	18.69	(77.76, 83.23)	<0.001[bce]
	Sub-health	480	61.41	24.31	(59.23, 63.59)	
	Disease	536	57.56	27.37	(55.23, 59.88)	
	Total	1198	62.58	26.17	(61.10, 64.07)	
	HK population norm	2533	62.40	25.40	(61.40, 63.40)	
SF	Health	182	94.64	11.55	(92.95, 96.33)	<0.001[ce]
	Sub-health	481	84.20	22.18	(82.21, 86.19)	
	Disease	536	81.53	25.24	(79.39, 83.67)	
	Total	1199	84.59	22.84	(83.30, 85.89)	
	HK population norm	2533	81.80	23.80	(80.90, 82.70)	
RE	Health	182	93.27	11.12	(91.64, 94.90)	<0.001[ce]
	Sub-health	477	79.66	18.84	(77.97, 81.36)	
	Disease	534	79.94	22.40	(78.03, 81.84)	
	Total	1193	81.86	20.21	(80.72, 83.01)	
	HK population norm	2533	77.20	21.50	(76.30, 78.00)	
MH	Health	182	82.14	13.29	(80.20, 84.09)	<0.001[ce]
	Sub-health	479	64.09	18.29	(62.45, 65.73)	
	Disease	536	62.94	20.25	(61.22, 64.66)	
	Total	1197	66.32	19.72	(65.20, 67.44)	
	HK population norm	2533	68.80	18.70	(68.10, 69.50)	
PCS	Health	182	54.71	4.28	(54.09, 55.34)	<0.001[ace]
	Sub-health	473	51.28	7.66	(50.59, 51.97)	
	Disease	521	44.32	12.00	(43.29, 45.35)	
	Total	1176	48.73	10.34	(48.14, 49.32)	
	HK population norm	2533	50.10	9.10	(49.70, 50.40)	
MCS	Health	182	56.09	6.51	(55.14, 57.04)	<0.001[bce]
	Sub-health	473	46.79	10.29	(45.86, 47.72)	
	Disease	521	48.45	11.36	(47.47, 49.43)	

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Total	1176	48.96	10.77	(48.35, 49.58)
HK population norm	2533	50.00	9.50	(49.60, 50.40)

PF = Physical Functioning; RP = Role Physical; BP = Bodily Pain; GH = General Health; VT = Vitality; SF = Social Functioning; RE = Role Emotional; MH = Mental Health;
PCS-12 = Physical Component Summary score; MCS-12 = Mental Component Summary score
Notes:
**Significance among 3 SHQ groups (Health, Sub-health & disease groups)*
[a] *The statistical significance between SHS & Disease groups is lower than 0.01.*
[b] *The statistical significance between SHS & Disease groups is lower than 0.05.*
[c] *The statistical significance between Health & Disease groups is lower than 0.01.*
[d] *The statistical significance between Health & Disease groups is lower than 0.05.*
[e] *The statistical significance between SHS & Health groups is lower than 0.01.*
[f] *The statistical significance between SHS & Health groups is lower than 0.05.*

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5.4.5 Relationship between Sub-health, HRQOL and Health Services Utilization

Health service utilization rates

When asked whether they had consulted a doctor during one month before interview, some 415 (34.5%) gave an affirmative answer (see Table 5-5). The difference in proportions between these three groups was statistically significant ($p<0.01$) by Chi-square tests (SPSS. Statistical Package for the Social Sciences Base 17.0 User's Guide. USA).

The reported mean monthly consultation rate was 0.43 and 13.6% of Sub-health subjects said that they had been hospitalized in the previous one month. The CMP consultation rates tended to increase with the suffering of Sub-health (see Table 5-6 and Table 5-7).

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Table 5-5 Persons who had consulted a doctor during the previous one month by SHQ groups

SHQ group	No. of persons consulted a doctor (%)	No. of persons did not consult a doctor (%)	Total	Rate*
Health	25 (6.0%)	157 (94.0%)	182 (15.3%)	13.7
Sub-health	127 (30.6%)	371 (69.4%)	498 (41.7%)	25.5
Disease	263 (63.4%)	250 (26.6%)	513 (43.0%)	51.3
Overall	415 (100%)	778 (100%)	1193 (100%)	34.5

Notes:
** As a percentage of all persons in the SHQ groups. For example, all subjects with Sub-health had consulted a doctor during the previous one month before interview.*
- Difference in proportions was significantly different between the three groups by Chi-square test (p<0.01)

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Health Services Utilization Pattern

Table 5-6 shows 1231 subjects' health services utilization pattern. There were significant differences in the results between different SHQ health state groups (Sub-health and Disease, Health and Disease) but the difference of HRQOL between the two Health and Sub-health states did not meet the statistical significance. It should be noted that service utilization rates of SH group were closer to those of the Disease group than Healthy group.

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Table 5-6 Service Utilization Rates by type of Service and Sick Leave Rates by SHQ groups over the past 4-week one month

	Type of medical practitioners having consulted and related rates																				
	WMP*						CMP						A&E			Hospitalization			Sick leave		
	Regular			Episodic			Regular			Episodic											
	No.	%	95% CI	No.	%	95% CI	No.	%	95% CI	No.	%	95% CI	No.	%	95% CI	No.	%	95% CI	No.	%	95% CI
Health (n=188)	7	2.8	(0.00,0.56)	17	4.7	(0.42,0.94)	4	4.8	(-0.17,0.49)	11	6.5	(0.03,0.85)	1	2.1	-	1	4.5	-	3	1.4	(0,0.05)
Sub-health (n=484)	34	13.5	(0.13,0.40)	118	32.3	(0.77,1.09)	29	34.5	(0.05,0.41)	42	25.0	(0.14,0.52)	11	23.4	(0.94,1.81)	3	13.6	(1.00,1.00)	104.5	47.1	(0.08,0.50)
Disease (n=518)	211	83.7	(0.66,0.93)	230	63	(0.74,1.00)	51	60.7	(0.07,0.31)	115	68.5	(0.29,0.58)	35	74.5	(0.97,1.36)	18	81.8	(0.86,1.39)	114.5	51.6	(0.28,0.81)
Total (n=1190)	252	100	(0.51,0.70)	365	100	(0.78,0.98)	84	100	(0.11,0.30)	168	100	(0.29,0.51)	47	100	(1.04,1.37)	22	100	(0.89,1.31)	222	100	(0.18,0.46)

*Notes: * Including private practitioners of Western medicine, whether registered or not, and doctors in out-patient departments of private hospitals, exempted clinics and clinics of institutions and charitable organizations.*

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The main significant difference between Sub-health and Disease groups was found in the rates of total number of regular consultations with Western medicine practitioners (WMP) in the last one month or both Chinese medicine practitioners (CMP) and WMP. Significant difference ($P<0.01$) was also found in the rates of episodic consultations with CMP in the last one month but there is little difference ($P=0.158$) in the rates of episodical consultation with WMP among the health groups (Sub-health vs. Disease). There was statistically significant difference in the rates of using Accident and Emergency Department services in the last one month between the health groups (Sub-health vs. Disease). The significant difference was also found in the rate of hospitalization in the last one month between Sub-health and Disease groups. The difference in the rate of sick leave day was just short of statistical significance between SH and other groups ($P=0.052$).

There were significant rates who need regular follow-up by doctors among different health state groups indicating that the 482 (40.0%) subjects were taking long-term medicine prescribed by WMP or CMP or double consultations. There was significantly higher rates who need episodic CMP consultation than WMP in the same 482 (40.0%) Sub-health subjects indicating that the presence of doctors-shopping

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or double consultations.

5.4.6 Type of medical practitioners consulted

As shown in Figure 5-1, Western medicine practitioners turned out to be the most common type of medical practitioner consulted. Some 64.1% of those 152 consultations were attributed to people with Sub-health, followed by Chinese medicine practitioners (30.0%), and doctors in Accident and Emergency departments of clinics under Department of Health and of hospitals under Hospital Authority (5.9%).

In Table 5-6, Western medicine practitioners turned out to be the most common type of medical practitioner consulted regularly for diseases (83.7%). However, compared to WMP, Chinese medicine practitioners were the most common type of regular consultation for Sub-health (34.5% vs. 13.5%). Some 23.4% of those 47 consultations in Accident and Emergency departments of clinics under Department of Health and of hospitals under Hospital Authority (13.6%) for Sub-health. Some 47.1% of those 104.5 sick leave days of Sub-health subjects was similar to that of 51.6% of those 114.5 sick leave days of

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Disease subjects. (See Figure 5-1 and Table 5-6)

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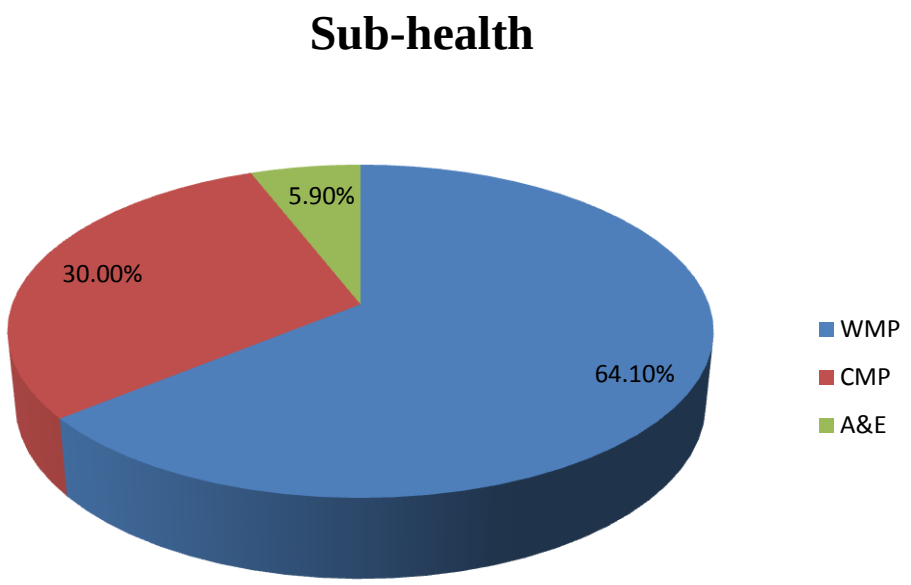
Figure 5-1 Percentage distribution of consultations made during the past one month before interview by type of medical practitioners consulted for Sub-health



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As the initial action when they were ill, about one third of episodic WMP or CMP consultations was of Sub-health group (32.3% vs. 25.0%). A small proportion of subjects with Sub-health would use Accident and Emergency departments of clinics under Department of Health and of hospitals under Hospital Authority (23.4% and 13.6% respectively) initially when they were ill. (See Table 5-6)

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Table 5-7 Health service utilization rates of different SHQ health states

	Groups	N	Mean	Sd	95% CI	ANOVA Sig. between groups
C-4. How many times have you consulted a doctor in the last one month?	Health	182	0.19	0.596	(0.11, 0.28)	<0.001 [ac]
	Sub-health	482	0.43	1.257	(0.32, 0.54)	
	Disease	534	1.20	1.768	(1.05, 1.35)	
	Total	1198	0.74	1.503	(0.65, 0.82)	
C-4a. How many times have you consulted a western medicine doctor for follow up?	Health	182	0.02	0.147	(0.00, 0.04)	<0.001 [ac]
	Sub-health	482	0.06	0.395	(0.03, 0.10)	
	Disease	536	0.41	0.888	(0.33, 0.48)	
	Total	1200	0.21	0.670	(0.17, 0.25)	
C-4b. How many times have you consulted a western medicine doctor for episodic illness?	Health	182	0.02	0.296	(-0.02, 0.07)	0.158
	Sub-health	482	0.05	0.478	(0.00, 0.09)	
	Disease	538	0.10	0.735	(0.04, 0.17)	
	Total	1202	0.07	0.589	(0.04, 0.10)	
C-4c. How many times have you consulted a Chinese medicine doctor for follow up?	Health	182	0.09	0.321	(0.04, 0.13)	<0.001 [ac]
	Sub-health	482	0.23	0.618	(0.18, 0.29)	
	Disease	535	0.45	0.889	(0.37, 0.52)	
	Total	1199	0.31	0.734	(0.26, 0.35)	
C-4d. How many times have you consulted a Chinese medicine doctor for episodic illness?	Health	182	0.06	0.396	(0.00, 0.12)	0.001 [ad]
	Sub-health	482	0.09	0.570	(0.04, 0.14)	
	Disease	536	0.24	0.930	(0.16, 0.31)	
	Total	1200	0.15	0.739	(0.11, 0.19)	
C-5. Have you used the Government or Hospital Authority Accident and Emergency Department in the last one month?	Health	182	0.006	0.074	(-0.005, 0.016)	<0.001[ac]
	Sub-health	481	0.013	0.111	(0.003, 0.022)	
	Disease	538	0.058	0.233	(0.038, 0.077)	
	Total	1201	0.032	0.175	(0.022, 0.042)	
C-5a. How many times have you used the Government or Hospital Authority Accident and Emergency Department in the last one month?	Health	182	0.01	0.074	(-0.01, 0.02)	<0.001 [ac]
	Sub-health	481	0.02	0.157	(0.00, 0.03)	
	Disease	538	0.07	0.298	(0.04, 0.09)	
	Total	1201	0.04	0.226	(0.02, 0.05)	
C-6. Have you ever been hospitalized in the last one month?	Health	182	0.006	0.074	(-0.005, 0.016)	0.006 [a]
	Sub-health	481	0.006	0.079	(-0.001, 0.013)	
	Disease	537	0.030	0.170	(0.015, 0.044)	
	Total	1200	0.017	0.128	(0.009, 0.024)	
C-6a. How many times have you ever been hospitalized in the last one month?	Health	182	0.01	0.074	(-0.01, 0.02)	0.008 [b]
	Sub-health	481	0.01	0.079	(0.00, 0.01)	
	Disease	537	0.03	0.209	(0.02, 0.05)	
	Total	1200	0.02	0.152	(0.01, 0.03)	
C-7. How many days of sick leave have you taken in the last one month?	Health	118	0.017	0.1296	(-0.007, 0.041)	[d]
	Sub-health	353	0.288	2.0903	(0.069, 0.506)	
	Disease	223	0.522	1.9224	(0.269, 0.776)	
	Total	694	0.317	1.8535	(0.179, 0.455)	

[a] *The statistical significance between SHS & Disease groups is lower than 0.01.*
[b] *The statistical significance between SHS & Disease groups is lower than 0.05.*
[c] *The statistical significance between Health & Disease groups is lower than 0.01.*
[d] *The statistical significance between Health & Disease groups is lower than 0.05.*

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Determinants of health service utilizations

Table 5-8 shows the structured multivariate linear regression model for SF-12v2 scores on SHQ groups controlling for sociodemographics factors. SHQ group was the strongest determinant of the differences in all HRQOL scores with more impairment found in people with lower baseline scores. Sub-health was associated with higher HRQOL score than disease but lower than that of Health group.

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Table 5-8 Structured Multivariate Linear Regressions of SF-12v2 scores on health groups, controlling for sociodemographics

	Regression coefficients by linear regression	
	SF-12v2-PCS (n=920)	**SF-12v2-MCS (n=920)**
SHQ groups [a]	-0.31**	-0.24**
Age [a]	-0.14**	0.27**
Sex [a]	-0.13**	
Social class [a]		
Education [a]		
Marital status [a]		-0.07*
Family income [a]	0.09**	0.07*
R square [a]	0.12	0.095

Notes:
Health group is the reference category
[a] Unstandardised regression coefficients of variables that were included in the model with p-values <0.05.Only variables that had a significant effect in the final model are shown. Data are presented as un-standardized coefficients by multivariable linear regression.
** Significant difference by general linear model (p<0.05)*
*** Significant difference when comparing with the indicator (p; <0.05)*

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Multi-variable linear regressions on total or acute consultation rate were carried out to test the dependence of service utilization rates on the change in SHQ groups, controlling for socio-demographic variables. Statistical significance was set at $p<0.05$. SPSS version 17.0 was used for all statistical analyses.

Table 5-9 shows the effect of SHQ groups by the linear regression analysis on monthly total or acute consultation rates controlling for sociodemographics. SHQ group was the strongest determinant of the differences in both monthly total and acute consultation rates with higher total consultation rate found in people with worse health condition but lower acute consultation rate in people with worse health status. Sub-health was associated with higher total consultation rate than Health group but lower than that of Disease group. However, SHQ groups had weak but significantly inverse effects on the acute consultation rate.

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Table 5-9 Structured regression model for monthly total or acute consultation rates on health groups, controlling for sociodemographics

	Regression coefficients by linear regression	
	Total consultation rate	**Acute consultation rate**
SHQ groups [a]	0.262**	-0.030**
Age [a]		
Sex [a]	0.085**	
Social class [a]		
Education [a]	-0.119**	
Marital status [a]		-0.022**
Family income [a]	0.075*	0.012**
R square [a]	0.094	0.040
Constant [b]	-0.436	2.022

Notes:
Health group is the reference category
[a] Unstandardised regression coefficients of variables that were included in the model with p-values <0.05.Only variables that had a significant effect in the final model are shown. Data are presented as un-standardized coefficients by multivariable linear regression.
[b] Beta is the standardised regression coefficient, indicating the change in standard units of the dependent variable for each increase of one standard unit in the independent variable, controlling for all other independent variables.
** Significant difference by general linear model (p<0.05)*
*** Significant difference when comparing with the indicator (p; <0.05)*

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5.5 Discussions

5.5.1 Prevalence and Risk Factors of Sub-health

To the best of our knowledge, this was the first study to systematically investigate the epidemiology and clinical significance of the Sub-health state in a general Chinese population in Hong Kong. And it was the first study to show a gradient relationship between the SF-12v2 scores across the spectrum of health state groups classified by the SHQ. Among the 1231 subjects at baseline, 188 (15.3%) subjects were classified as healthy, 484 (39.3%) classified as having Sub-health, 518 (42.1%) were classified as having disease(s) and 41 (3.3%) could not be classified. The findings were consistent with those of previous population surveys showing 15% of people were healthy (Xie Yanming, Liu Baoyan et al. 2006) and 38% suffered from chronic diseases (Chen. 2009), and an estimate of 30% classified as Sub-health. The prevalence of Sub-health was 39.3% classified by SHQ, which is similar as found by some studies in mainland Chinese population (蔡旭玲, 张冠群 et al. 2004; Chen. 2009), but much lower than those reported in studies by Huo et al (Yunhua 2007) in

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Mainland and Liang et al. (Xinghua 2009) in Hong Kong (65.1% and 84% respectively). The difference in the prevalence may be the result of the use of different diagnostic criteria. A lower prevalence found in our study could also be due to the exclusion of those diagnosed to have an acute disease.

The effects of the sociodemographic factors (age, sex, marital status, educational level, social class and family income) on the determinants of Sub-health were also explored. Females tend to have higher probability on Sub-health than males, which was also reported in other previous studies in mainland China (张素炎, 常群英 et al. 2003; Hui, Jiaxu et al. 2011). Subjects aged among 40-64 years old are less likely to have Sub-health than those aged among 18-39 years old. This may imply that people aged among 40-64 years old are more likely to have one or more disease due to aging. The other possible explanation is that people aged 40-64 years old are more adaptive to subjective perceptions, somatic symptoms and bodily dysfunctions instead of doctor-shopping. Subjects whose family income below $5,000 are more likely to have Sub-health. Financial burden can be worrying and depressing, especially if the financial difficulties present but people cannot lessen or solve it. The other possible explanation is that people

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in low-income households are more likely to perceive Sub-health symptoms and problems. The findings were consistent with those of previous population surveys reporting that correlation between Sub-health and family environmental factors among 3320 university students in Bengbu city with the multidimensional Sub-health questionnaire of adolescents (MSQA) “青少年亞健康多維評定問卷” MSQA (Tao, Hu et al. 2008; Xing, Tao et al. 2008).

5.5.2 HRQOL and Sub-health

As hypothesized, the SF-12v2 domain scores of Sub-health group were higher than those of disease group but lower scores than those of health group. No statistical significant difference was found between Sub-health and Disease in the SF-12v2 domain (SF, RE and MH) scores.

Similar to the findings from previous studies (Chen. 2009; Zhimin, Li et al. 2009), this study showed that Sub-health was a distinct state between Health and Disease in terms of its impact on a person’s life. HRQOL and Sub-health might be closely correlated in that the

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presence of Sub-health might impair HRQOL and adverse HRQOL might predispose to Sub-health especially symptom somatic or psychological problems, we found that HRQOL (the SF-12v2 scores) and Sub-health were two independent determinants of service utilization.

Our results showed that people with Sub-health had significantly lower quality of life than the healthy group. Their SF-12v2 mental component summary score (MCS) score was even lower than that of the disease group indicating significant mental stress. Subjective symptoms and health problems can be worrying and depressing, especially if they present but no cause can be found by the doctor. The other possible explanation is that people with mental stress are more likely to perceive symptoms and problems (Kirmayer, Groleau et al. 2004). A mainland China study of 1301 adults also showed that 838 (69.7%) people diagnosed by CMSHQ to have Sub-health had significantly lower quality of life scores measured by the SF-36 Health Survey compared with 199 (16.5%) healthy subjects (Zhimin, Li et al. 2009). Another study also found people with Sub-health have similar impairment of QOL, (Kefan. 2009).

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5.5.3 Health Services Utilization associated with Sub-health and HRQOL

The impact of Sub-health on consultation, hospitalization and medication usage rates deserves more investigations. Our results supported our hypotheses that the Sub-health is important to guide the estimation of the health service needs of the population, correlated with HRQOL scores.

The effects of the Sub-health on the consultation rates were stronger than those of sociodemographic associated with HRQOL impairment. Consulting CMP was the second preferred initial reaction to Sub-health chosen by a higher proportion of Sub-health people than those in the Health and Disease groups. The main difference in the illness behavior between consulting the CMP and WMP was a 2.6 times (34.5% vs. 13.5%) greater tendency to consult CMP for regular illness follow-up in Sub-health adults who seemed to be more CMP dependent, associated with similar sick leave rates (47.1% vs. 51.6%) between Sub-health and Disease groups (see Table 5.6). That may be one reason to support that Sub-health is common and clinically important to both TCM and WM.

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Sub-health Subjects had higher total rates of consultations (49.0 %) in the last one month when compared with the general population (22.7%) (HKSAR 2007b). The study samples were older and therefore they were more likely to have more requests for medical services. Up to 213 Sub-health subjects had consulted doctor within one month including 142 with Sub-health consulted for WMP and 71 asked for CMP. The proportion of subjects consulted CMP was 484 (14.7%) Sub-health subjects was higher than the 13.2% reported in the general population (HKSAR 2007b), although the proportion consulted for CMP was only about one half of that for WMP. This suggested more and more subjects with Sub-health consulted at least one kind of medical consultations, either WMP or CMP within last one month. 84 (31.7%) subjects with disease used both WMP and/or CMP consultations, which is relatively lower than the 40% prevalence of doctor-shopping in Hong Kong general outpatient departments (GOPDs) (Lo, Hedley et al. 1994) because this is a cross-sectional telephone survey instead of clinical studies. However, only 14 (6.6%) subjects with Sub-health used both WMP and/or CMP services, conflicted with their significant lower SF-12v2 MCS score than that of the disease group. As already discussed, people with Sub-health can be worrying and depressing for their subjective symptoms, especially if the doctor find no cause to explain their health problem. The other

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possible explanation is that Chinese avoid open expressing their emotions due to their fear of being stigmatized as “mental” patients (Lo, Hedley et al. 1994). The emotional factors may lead to incorrect perception of illness severity, a delay in seeking medical help (Rizzardo, Borgherini et al. 1991) (Lo, Hedley et al. 1994), or even treatment refusals (Connelly and Campbell 1987) (Lo, Hedley et al. 1994). Since the fundamental cause of the Sub-health problems is not find out, it is not surprising that psychosomatic symptoms persist. Furthermore, the doctor-shopping pattern for Sub-health still remains uncertain because people with Sub-health may use multiple over-the-counter (OTC) products for self-medication instead of professional consultations.

5.6 Limitations

This telephone survey relied on the patients’ subjective reporting of disease and service utilization without objective validation by doctors. Some people classified as Sub-health could have a sub-clinical disease, and there could be recall bias in the reporting of service utilization rates. Further studies comparing the SHQ classification against the doctor’s diagnosis and service utilization records should be done to

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confirm the accuracy of our results.

We used the monthly total and acute consultation rates and hospitalization rate as indicators of service utilization because they directly measure clinical workload (Hulka and Wheat 1985; Nelson, McHorney et al. 1998; Dunlop, Coyte et al. 2000; Lam, Fong et al. 2002).

Theoretically, we can estimate health service utilization for Sub-health in Hong Kong by total health care expense but it is complex because payment methods and prices of clinical governmental and private WMP and CMP consultation services are diverse (William Hsiao and Yip 1999; Lam, Fong et al. 2002). We have measured the effectiveness of TCM in our study because TCM plays an important role as an indispensible part of the overall health services currently. It is possible to compare the consultation rates directly because the determinants of the service utilization of TCM are different from those of Western medicine (Lam, Fong et al. 2002).

A limitation of our analysis was that it excluded the adults who could not be classified by SHQ, therefore, the results may not be applicable to these “unclassifiable” people. This bias might have affected the

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reported utilization rates and HRQOL but should not have much effect on the results of the regression analyses that were controlled for sociodemographic variables.

Another limitation in the cross-sectional study is the possible problem of reverse causality bias in determining cause and effect of Sub-health. As discussed already, the SF-12v2 mental component summary score (MCS) of people with Sub-health was even lower than that of the disease group indicating significant mental stress. People can be worrying and depressing for their subjective symptoms, especially if the doctor find no cause to explain their health problem. The other possible explanation is that people with mental stress are more likely to perceive symptoms and problems (Kleinman 1982). However, the emotional factors, such as fear or anxiety, may lead to incorrect perception of illness severity, a delay in seeking medical help (Rizzardo, Borgherini et al. 1991; Lo, Hedley et al. 1994), or even treatment refusals (Connelly and Campbell 1987; Lo, Hedley et al. 1994). Since the fundamental cause of the psychosomatic symptoms is not find out, it is not surprising that Sub-health somatization problems persist and impair the HRQOL.

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5.7 Summary

The recognition of Sub-health is important so that early intervention/ individualized "maintenance self-care plan" (e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿） and dietary supplement etc.) can be given to restore health if health service is to be truly intended to promote person-centered health instead of only disease focused treatments. Over 96.7 % of people in the general population could be classified by SHQ into health, Sub-health and disease groups successfully. The prevalence of Sub-health is 40.67% (484 subjects of the total 1231) in Hong Kong Chinese population. And there were significant differences in SF-12v2 scores in that Sub-health group had higher scores than those of disease group but lower scores than those of health group. Not only impair the HRQOL, Sub-health also resulted in excessive use of medical outpatient consultations, Accident and Emergency, and in-patient service implying higher medical resource expenditure.

The results may provide evidence supporting the conceptual bases for Sub-health, and its significance to the person as well as the health care

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system.

Further research by a longitudinal study to examine the changes of HRQOL associated with the changes of SHQ states, especially the change between Sub-health and Healthy states was carried out and the results will be presented in the next Chapter.

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Chapter 6

Relationship between Change in Health State (HS) and Change in Health-related Quality of Life (HRQOL)

6.1 Introduction

The cross-sectional association between HS and HRQOL has been demonstrated in Chapter 4, however cross-sectional association does not necessarily imply longitudinal association or causality. The epidemiology, health-related quality of life (HRQOL) and the clinical significance of Sub-health have been determined and the results of the cross-sectional survey have been shown and discussed in Chapter 5. They indicate that nearly 40% Chinese adults had Sub-health (SH) in Hong Kong. Subjects with Sub-health had significantly lower health-related quality of life scores (SF-12v2) than those of healthy subjects. As hypothesized, the PCS score of the Sub-health were intermediate between Health and Disease, but the MCS of Sub-health group was the lowest among three groups. The differences in SF-12 PCS and MCS scores between groups were statistically significant by one-way ANOVA.

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In addition to the originally planned cross-sectional survey to estimate the prevalence, HRQOL and the clinical significance of Sub-health, the study was extended to include a longitudinal study to follow up 454 subjects on 2-week retest after their baseline in order to assess the reliability of the Sub-health questionnaire (SHQ) for classifying different health states (HS) into Health, Sub-health and Disease state (see Chapter 4).

There is still some uncertainty on the change between the three health states (Health, Sub-health and Disease) because of a lack of detectable quantified indicators of health and Sub-health. In order to explore the relationship between change in health states (HS) and change in HRQOL, we planned and proceeded with a one-year follow-up of 289 individuals to measure the change of SHQ, SF-12v2 and SF-6D with time.

This Chapter presents the results of a one-year longitudinal study to explore the relationship between the change in the HS and the change in the HRQOL in the Hong Kong Chinese population. To our knowledge, it is clinical important for us to understand the natural history of Sub-health better and it had never been tested.

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6.2 Aim and Objectives

The aim of this study is to explore the longitudinal relationship between health states (HS) and HRQOL.

The objectives are

1) To understand the natural history of Sub-health better;
2) To explore the change of HRQOL associated with the change of SHQ health states;
3) To determine any difference in the service utilization rates associated with the change of SHQ health states;
4) To estimate the clinically important difference (CID) of HRQOL scores (SF-12v2 and SF-6D) between different time points.

6.3 Methods and Subjects

6.3.1 Response rate

A total of 289 subjects (out of 1231) (23.5%) agreed in the earlier cross-sectional study to participate the one-year longitudinal study.

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Each subject completed the SHQ, the SF-12v2 Health Survey and a structured questionnaire on sociodemographic data, and health service utilization at 3, 6, 9, 12 months after the baseline survey. 255 subjects were attempted and finished the 3-month survey, 244 completed the 6-month survey, 228 finished the 9-month survey and finally 205 subjects competed the final 12-month follow-up, giving a final response rate of 70.9% (205/289). These numbers are grouped by contact status as follows in Table 6-1:

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6.3.2 Study Design, Setting and Subjects

As discussed above in 5.4.1, previous studies found that MCID in HRQOL corresponded to an effect size difference of 0.3 to 0.5. A sample size of 176 per group is needed to detect an effect size difference of 0.3 by independent t test, with a power of 80% and a confidence interval of 95% (Florey 1993). Previous population surveys found 15% of people were healthy (Xie Yanming, Liu Baoyan et al. 2006), 38% suffered from chronic diseases (Lam, Lauder et al. 2003), and it is estimated that 30% may be classified as SHS. A sample size of 1173 is needed to include the required number of at least 176 in each group. 1200 subjects will be surveyed.

The longitudinal data of 289 subjects who had agreed to participate the 3 to 12 months follow up surveys to determine the change in health states and the associated change in HRQOL. Telephone numbers that are not answered after 3 callings were excluded from the study.

6.3.3 Data Collection

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The aim, procedures and prospective longitudinal nature of the study were explained and oral consent was obtained from each subject (see Appendix C). Each subject answered a structured questionnaire (see Appendix G) that consists of three parts: 1) The Sub-health Questionnaire (SHQ); 2) The Chinese (Hong Kong) SF-12v2 Health Survey (ETP Lam, CLK Lam et al. 2008); 3) A questionnaire on sociodemographic data, chronic morbidity and health service utilization (Lam, Fong et al. 2002; Lam, Lauder et al. 2003). The study questionnaire has been introduced in Chapter 3 (3.2.1). The survey instrument consisted of a structured questionnaire on service utilization rates, sociodemographic characteristics, chronic morbidity and the Chinese (HK) version of the SF-12v2 (Lam, Tse et al. 2005). Service utilization was measured by self-reported monthly consultation rate (number of outpatient consultations with a registered medical practitioner in the past one month), and monthly hospitalization rate (any admission into the hospital in the past one month). Each subject was asked if he/she had ever used any medications (medicine or treatment) over the past one month. Demographic variables that were collected included age, gender, educational level, marital status, social class by occupation and income range (General Register Office 1966).

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The differences between known groups (e.g. people with or without diseases, placebo and treatment groups in a clinical trial) were be used to some measures of variability, comparing the change over time in one group to the standard deviation (SD) at baseline (Hays and Woolley 2000). Different indicators have been proposed: the effect size (ES) (change divided by baseline standard deviation) (Wewers and Lowe 1990), which can be correlated with Cohen's (Krueger, McClain et al. 2004) classification (small, moderate and large effects). Cohen's effect size, which is the ratio of the mean change over time in one group to the standard deviation (SD) at baseline (Cohen 1988; Hays and Woolley 2000). The effect size (ES) statistic [Effect size = (Mean of the active (treatment) group - Mean of the control group)/Standard deviation of the QOL baseline scores (Wyrwich, Bullinger et al. 2005). In previous studies, effect size > 0.3 have been considered to indicate clinically-significant effects (Cohen 1988; Florey 1993; Wyrwich, Bullinger et al. 2005). In our studies, a (HS) effect size based on means usually considers the standardized mean difference between two SHQ health states.

6.3.4 Data Analysis

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Data analysis

1) The subjects were classified into 3 groups: 1. the Health group of people who report physical, psychological and social well-being and without any symptom or chronic disease 2. the Sub-health group of people who had any symptoms or suboptimal vitality leading to reduced functional and adaptive capacity relative to health without any detectable disease (China Association of Chinese Medicine. 2006); and 3. the Disease group of people reporting one or more chronic disease that has been diagnosed by a doctor for more than one month or acute disease that has been recognized by a clinical doctor (see Chapter 4.4.1 - data analysis);

2) The differences in the SF-12v2 scores between the groups were tested by independent *t* tests associated with the change in different health states;

3) The difference in the monthly consultation, hospitalization, A&E visit, use of medication and sick leave rates between the three groups will be tested by chi square tests;

4) The effect size difference in the SF-12v2 scores between the Health and Sub-health, and between the Sub-health and disease groups will be estimated by the dividing the score difference by the standard deviation of the whole population, which will be used as an estimate of the CID.

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Statistical significance level is P<0.05. SPSS version 17.0(SPSS. Statistical Package for the Social Sciences Base 17.0 User's Guide. USA) was be used for all statistical analyses.

6.4 Results

6.4.1 Characteristics of Subjects

The characteristics of the three groups of subjects at different time slots (baseline, 3-month, 12-month) are shown and compared to the Hong Kong general population (2006) in Table 6-1. Subjects had a wide range of age from 18 to 89 years old at the beginning or the longitudinal study and 18-77 years old when the whole study completed, and were generally old than the 2006 general population (mean age 46, 45 vs. 40 years). The sex distribution of our samples was more likely to be female, in comparison with the 2006 Hong Kong general population. The educational level of our samples was more likely to be higher compared with the Hong Kong general population in 2006. The marital status of our samples was more likely to be married, in comparison with the Hong Kong general population.

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The income range of our samples was more likely to be higher compared with the Hong Kong general population.

Table 6-1 compares the sociodemographic characteristics of the sample in the longitudinal study to that of the Hong Kong General Population 2006 By-census (Census & Statistics Department Hong Kong, 2006). The proportion of young adults was lower and that of the elderly was higher than those of the By-census. The proportion of males was lower and that of the females was higher than those of the By-census. The distribution in occupation of our subjects was not directly comparable to that of the By-census in that different classification methods of occupation were applied. We used the British Registrar General classification of occupation in order to indicate social class (General Registrar Office, 1966) instead of the International Standard Classification of Occupation used by By-census.

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Table 6-1 Sociodemographic characteristics of study sample compared to the Hong Kong General Population By-census (2006)

Characteristics	Subjects at baseline study	Subjects attempted in longitudinal study at 3-month	Subjects completed the whole longitudinal study at 12-month	Hong Kong General population (2006)
N	1231	255	205	5722500
Age (yr), Mean	45.7	44.8	44.3	39.6 [a]
± SD	16.3	16.3	15.95	11.17
Range of age (yr)	18-89	18-89	18-77	18-85
Sex (%)				
Male	36.1	34.1	33.5	47.7[b]
Female	63.9	65.9	66.5	52.3
Education level (%)				
No formal school	3.2	0.8	1.0	7.1[c]
Primary school	15.4	13.2	11.2	18.3
Secondary school (including matriculation)	53.9	51.6	52.1	51.6
University or above	27.2	33.3	34.5	23.0
I don't know	0.3	1.1	0.5	-
Occupation (%)				
Associated Professionals /professionals	14.3	15.1	11.2	N.A.
Skilled worker	14.9	14.0	17.5	N.A.
Semi-skilled workers	18.7	17.8	18.9	N.A.
Housewife	20.3	21.3	9.2	N.A.
Students	8.9	10.5	20.9	N.A.
Retired/unemployed	20.6	16.7	18.0	N.A.
I don't know	2.3	3.7	4.3	N.A.
Marital Status, (%)				
Single	25.6	26.7	27.2	32.4[d]
Married	65.0	64.0	61.7	57.8
Widowed	4.1	4.3	5.8	6.0
Divorced/Separated	4.5	4.3	3.9	3.8
I don't know	0.8	0.8	1.4	-
Income range, n (%)				
< $5,000	11.4	13.0	14.1	10.9
$5,000-10,000	14.2	13.5	11.0	17.7
$10,000-20,000	26.2	32.1	29.4	27.9
$20,000-30,000	16.6	15.3	16.6	17.4

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$30,000-40,000	10.8	7.9	10.4	9.8
> $40,000	20.8	18.1	18.4	16.3

Note:

[a] *Mean age was significantly different between the three groups by Chi-square test (p<0.05)*

[b] *Sex was significantly different between the three groups by Chi-square test (p<0.05)*

[c] *Education level was significantly different between the three groups by Chi-square test (p<0.05)*

[d] *Marital Status was significantly different between the three groups by Chi-square test (p<0.05)*

[e] *Income range was significantly different between the four groups by Chi-square test (p<0.05)*

N. A. - No available information for comparison

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6.4.2 Change in Health State over one year

Table 6-2 shows the changes in different health states among every 3-month over one year follow-up. There were many different changes between the results of different SHQ health states but the percents of unchanged subjects among every three months over a year are similar. Among 255 subjects attempted in the 3-month, 6-month, 9-month and 12-month follow ups, 225 cases can be classified by SHQ into three health states and finally 153 subjects completed all the follow-ups.

As shown in the Table 6-2, at least some 60.6% subjects with Sub-health were unchanged into other health states. Some 20% subjects with Sub-health changed into Healthy state and the remaining 20% subjects with Sub-health changed into Disease state indicating that Sub-health is an independent and stable condition for person's health. The prevalence of Sub-health was still about 40%.

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Table 6-2 Change in health state with number and percent in every three months over one-year period*

Health States (HS) classified by SHQ standard at baseline	3-month retest Health States (HS)			
	Health	Sub-health	Disease	Total
Health	**11 (50.0%)**	6 (27.3%)	5 (22.7%)	22
Sub-health	23 (23.7%)	**60 (61.9%)**	14 (14.4%)	97
Disease	11 (10.4%)	23 (21.7%)	**72 (67.9%)**	106
Total	45 (20.0%)	89 (39.6%)	91 (40.4%)	225
	6-month retest Health States (HS)			
HS at 3-month	Health	Sub-health	Disease	Total
Health	**15 (38.4%)**	12 (30.4%)	12 (30.8%)	39
Sub-health	20 (20.1%)	**50 (60.2%)**	13 (15.7%)	83
Disease	5 (6.0%)	11 (13.3%)	**67 (80.7%)**	83
Total	40 (19.5%)	73 (35.6%)	92 (44.9%)	205
	9-month retest Health States (HS)			
HS at 6-month	Health	Sub-health	Disease	Total
Health	**16 (51.6%)**	9 (29.0%)	6 (19.4%)	31
Sub-health	17 (25.8%)	**40 (60.6%)**	9 (13.6%)	66
Disease	8 (10.4%)	10 (13.0%)	**59 (76.6%)**	77
Total	41 (23.6%)	59 (33.9%)	74 (42.5%)	174
	12-month retest Health States (HS)			
HS at 9-month	Health	Sub-health	Disease	Total
Health	**22 (55.0%)**	13 (32.5%)	5 (12.5%)	40
Sub-health	5 (10.2%)	**34 (69.4%)**	10 (20.4%)	49
Disease	3 (4.7%)	12 (18.7%)	**49 (76.6%)**	64
Total	30 (19.6%)	59 (38.6%)	64 (41.8%)	153

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Table 6-3 summaries the transition patterns of SHQ model,

showing subject counts and proportion of 153 individuals who experienced each health transition during the one-year follow up period. We grouped the transition patterns into 4 trajectories: stable (5 waves in a same state), declining (Health at start to SH/Disease at end; SH at start to Disease at end), improved (SH at start to Health at end; Disease at start to SH/Health at end), and intermittent change (all other combination). The largest group was those that remained in disease state during the whole period. Next came a large minority in people who stayed in Sub-health state. Considerably a large majority healthy individuals had declining health trajectories, and less than 4% Sub-health subjects were in the declining trajectories. Less than 5% of the Sub-health individuals and less than 6% of the subjects in disease state were in the improved trajectories, respectively. About two third people of Sub-health group had indeterminate trajectories, and it was approximate 50% and 30% for health group and disease group, respectively. A few participants (< 2%) with SH might expect to get colds easily from September in the study, but not later than December. Many other possible trajectories had not happened in this study, so they are not discussed further.

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Table 6-3 Subject counts (proportion) for trajectory pattern of the same subjects of each baseline health state group over 3,6,9 and 12 months (n=153)

Trajectory Groups*	Latent Health State Pattern					N (%)
	Baseline (in June)	3-month (in Sept)	6-month (in Dec)	9-month (in Mar)	12-month (in June)	
Health State						
Stable health	Health	Health	Health	Health	Health	3(1.96)
Declining	Health	Health	Health	Health	SH	2(1.31)
	Health	SH	Disease	Disease	Disease	1(0.65)
	Health	Disease	Disease	Disease	Disease	1(0.65)
Intermittent change	Health	Health	Health	Disease	Health	1(0.65)
	Health	Health	SH	Health	Health	1(0.65)
	Health	Health	Disease	Health	Health	1(0.65)
	Health	Health	Disease	Disease	SH	1(0.65)
	Health	SH	Health	SH	SH	1(0.65)
	Health	SH	SH	SH	Health	1(0.65)
	Health	Disease	Disease	Health	SH	1(0.65)
	Health	Disease	Disease	Disease	Health	1(0.65)
	Health	Disease	Disease	Disease	SH	1(0.65)
Sub-health State						
Stable Sub-health	SH	SH	SH	SH	SH	21(13.7)
Declining	SH	Disease	Disease	Disease	Disease	3(1.96)
	SH	SH	SH	Disease	Disease	2(1.31)
	SH	SH	SH	SH	Disease	1(0.65)
Improved	SH	SH	Health	Health	Health	3(1.96)
	SH	SH	SH	Health	Health	2(1.31)
	SH	SH	SH	SH	Health	1(0.65)
	SH	Health	Health	Health	Health	1(0.65)
Intermittent change	SH	SH	SH	Health	SH	2(1.31)
	SH	SH	Health	Health	SH	2(1.31)
	SH	SH	SH	Health	Disease	2(1.31)
	SH	SH	SH	Disease	SH	2(1.31)
	SH	SH	Health	SH	SH	1(0.65)
	SH	SH	Health	SH	Disease	1(0.65)
	SH	SH	Health	SH	Health	1(0.65)
	SH	SH	Disease	Disease	SH	1(0.65)
	SH	Health	Health	SH	SH	1(0.65)
	SH	Health	SH	SH	SH	1(0.65)
	SH	Health	SH	SH	Health	1(0.65)
	SH	Health	SH	Health	Health	1(0.65)
	SH	Health	SH	Health	Health	1(0.65)
	SH	Health	Health	SH	Disease	
	SH	Health	Disease	Health	Health	
	SH	Health	Health	Health	Disease	
	SH	Health	Disease	Disease	SH	
	SH	Health	Disease	SH	SH	
	SH	Health	Disease	Health	Health	
	SH	Health	Disease	SH	SH	
	SH	Disease	SH	SH	SH	
	SH	Disease	Health	Health	SH	
	SH	Disease	Disease	SH	Health	

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	SH	Disease	Health	Disease	Health	1(0.65)
	SH	Disease	SH	Health	Health	1(0.65)
	SH	Disease	SH	SH	SH	1(0.65)
	SH	Disease	SH	Health	Health	1(0.65)
	SH	Disease	SH	SH	Disease	1(0.65)
	SH	Disease	Disease	Health	Health	1(0.65)
Disease State						
Stable disease	Disease	Disease	Disease	Disease	Disease	38(24.8)
Improved	Disease	SH	SH	SH	SH	3(1.96)
	Disease	Disease	Disease	Disease	SH	2(1.31)
	Disease	Disease	Disease	SH	SH	1(0.65)
	Disease	Disease	SH	Health	Health	1(0.65)
	Disease	Disease	Health	Health	Health	1(0.65)
	Disease	SH	SH	Health	Health	1(0.65)
Intermittent change	Disease	Disease	Disease	SH	Disease	2(1.31)
	Disease	SH	SH	Health	SH	2(1.31)
	Disease	SH	Disease	Disease	SH	2(1.31)
	Disease	Disease	SH	Disease	Disease	2(1.31)
	Disease	Health	Health	Health	SH	2(1.31)
	Disease	Disease	Health	Disease	Disease	1(0.65)
	Disease	SH	Disease	SH	Disease	1(0.65)
	Disease	SH	SH	Disease	SH	1(0.65)
	Disease	SH	SH	Disease	SH	1(0.65)
	Disease	SH	Disease	Health	Health	1(0.65)
	Disease	Health	SH	Health	Disease	1(0.65)
	Disease	Health	SH	SH	SH	1(0.65)
	Disease	Health	SH	Health	SH	1(0.65)
	Disease	Health	Disease	Health	Disease	1(0.65)
	Disease	SH	Disease	SH	Disease	1(0.65)
	Disease	SH	SH	SH	Disease	1(0.65)
	Disease	SH	Health	SH	SH	1(0.65)
	Disease	SH	Disease	Disease	Disease	1(0.65)
Total						153(100)

** Transition pattern were grouped into 4 trajectories: stable (5 waves in a same state), declining (Health at start to SH/Disease at end; SH at start to Disease at end), improved (SH at start to Health at end; Disease at start to SH/Health at end), and intermittent change (all other combination).*

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Figure 6-1 and Figure 6-2 show the natural history of different health states (percent unchanged and changed) in every 3-month over a one-year period. Some 60% subjects' Sub-health condition was unchanged within a 3-month time slot. Half of the remaining 40% subjects with Sub-health condition were changed into either Health or Disease state.

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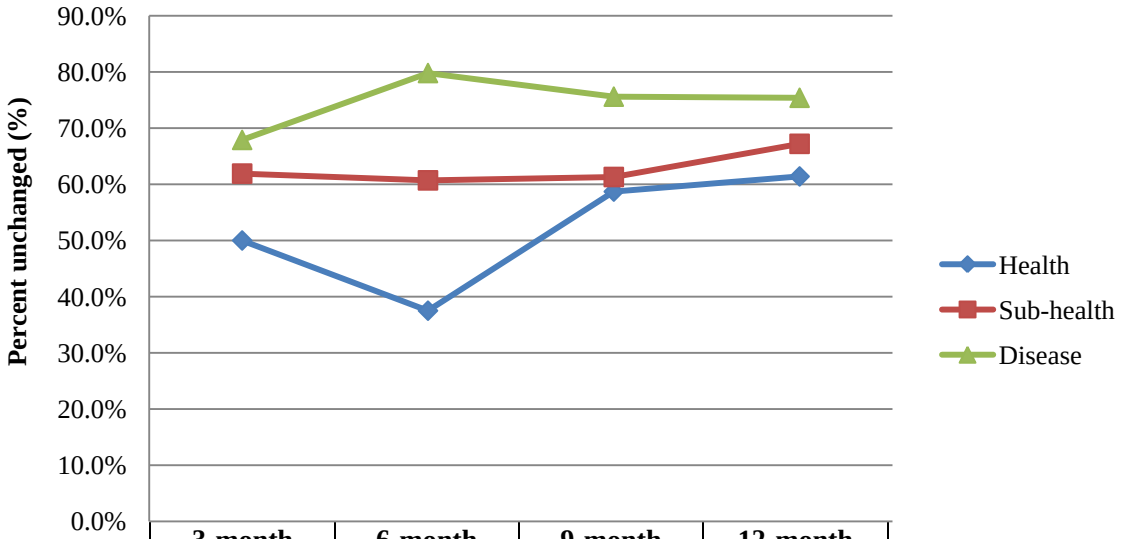
Figure 6-1 The percentage of respondents with health states classified by SHQ unchanged in every 3 months over one year



	3-month (%, 95%CI)	6-month (%, 95%CI)	9-month (%, 95%CI)	12-month (%, 95%CI)
Health	50.0% (27.3%, 72.7%)	37.5% (21.8%, 53.2%)	58.7% (43.9%, 73.5%)	61.4% (48.4%, 74.4)
Sub-health	61.9% (52.0%, 71.7%)	60.7% (50.1%, 71.4%)	61.3% (50.1%, 72.6%)	67.2% (55.1%, 79.3%)
Disease	67.9% (58.9%, 77.0%)	79.8% (71.0%, 88.5%)	75.6% (66.1%, 85.1%)	75.4% (64.9%, 85.8%)

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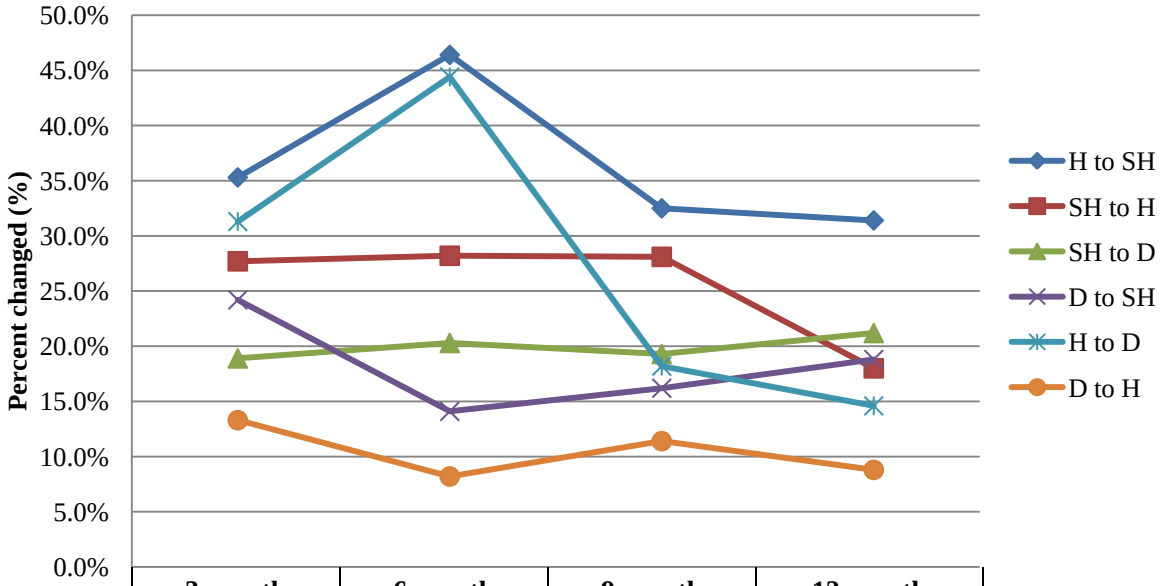
Figure 6-2 Among health states classified by SHQ, percent changed in every 3 months over one year period



	3-month (%, 95%CI)	6-month (%, 95%CI)	9-month (%, 95%CI)	12-month (%, 95%CI)
H to SH	35.3% (10.0%, 60.6%)	46.4% (26.7%, 66.1%)	32.5% (17.3%, 47.7%)	31.4% (18.2%, 44.6%)
SH to H	27.7% (17.9%, 37.5%)	28.2% (17.5%, 38.9%)	28.1% (16.8%, 39.4%)	18.0% (7.0%, 29.0%)
SH to D	18.9% (9.8%, 28.1%)	20.3% (10.2%, 30.4%)	19.3% (8.7%, 29.9%)	21.2% (9.7%, 32.6%)
D to SH	24.2% (15.4%, 33.0%)	14.1% (6.2%, 22.0%)	16.2% (7.6%, 24.8%)	18.8% (8.9%, 28.6%)
H to D	31.3% (5.7%, 56.8%)	44.4% (24.4%, 64.5%)	18.2% (4.3%, 32.1%)	14.6% (3.3%, 25.9%)
D to H	13.3% (5.8%, 20.7%)	8.2% (1.8%, 14.7%)	11.4% (3.8%, 19.1%)	8.8% (1.2%, 16.3%)

Notes:
H = Health state; SH = Sub-health state; D = Disease state

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Table 6-4 shows the numbers (percents and 95% CI) of changes in different health states with at least 2 3-month time slots over one year in order to assess the changes of HRQOL scores associated with the changes in Health states. Any subject may be double counted or missing in this analysis because the health state may be changed during a one-year period. And any subject may not complete all 3-month follow-ups and he/she may skip any slot during the whole year.

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Table 6-4 Change in health state with number and percent over at least 6 months in a one-year period*

Health States (HS) classified by SHQ standard at baseline	6-month retest Health States (HS)			
	Health	Sub-health	Disease	Total
Health (N, %, 95% CI)	**17 (54.8%) (36.3%, 73.4%)**	4 (12.9%) (0.5%, 25.3%)	10 (32.3%) (15.4%, 49.3%)	31
Sub-health (N, %, 95% CI)	27 (26.7%) (18.2%, 35.2%)	**58 (57.4%) (47.6%, 67.2%)**	16 (15.9%) (8.83%, 23.0%)	101
Disease (N, %, 95% CI)	7 (7.1%) (2.0%, 12.2%)	20 (20.2%) (12.3%, 28.2%)	**72 (72.7%) (63.8%, 81.7%)**	99
Total	51 (22.1%)	82 (35.5%)	98 (42.4%)	231
Health States (HS) classified by SHQ standard at baseline	**9-month retest Health States (HS)**			
	Health	Sub-health	Disease	Total
Health (N, %, 95% CI)	**14 (50.0%) (30.3%, 69.7%)**	6 (21.4%) (5.7%, 37.1%)	8 (28.6%) (11.4%, 45.7%)	28
Sub-health (N, %, 95% CI)	27 (30.0%) (20.7%, 39.3%)	**49 (54.4%) (44.0%, 64.9%)**	14 (15.6%) (8.2%, 23.1%)	90
Disease (N, %, 95% CI)	13 (15.3%) (7.7%, 23.0%)	16 (18.8%) (10.5%, 24.0%)	**56 (65.9%) (55.6%, 76.2%)**	85
Total	54 (26.6%)	71 (35.0%)	78 (38.4%)	203
Health States (HS) classified by SHQ standard at baseline	**12-month retest Health States (HS)**			
	Health	Sub-health	Disease	Total
Health (N, %, 95% CI)	**15 (50.0%) (31.0%, 69.0%)**	11 (36.7%) (19.1%, 54.4%)	4 (13.3%) (0.6%, 26.0%)	30
Sub-health (N, %, 95% CI)	29 (33.3%) (23.7%, 43.0%)	**44 (50.6%) (39.9%, 61.3%)**	14 (16.1%) (8.6%, 23.7%)	87
Disease (N, %, 95% CI)	4 (5.0%) (0.02%, 9.8%)	19 (23.7%) (14.2%, 33.2%)	**57 (71.3%) (61.1%, 81.4%)**	80
Total	48 (24.4%)	74 (37.6%)	75 (38.0%)	197
Health States (HS) classified by SHQ standard at 3-month	**9-month retest Health States (HS)**			
	Health	Sub-health	Disease	Total
Health (N, %, 95% CI)	**20 (57.1%) (39.9%, 74.4%)**	8 (22.9%) (8.6%, 37.1%)	7 (20.0%) (6.4%, 33.7%)	35
Sub-health (N, %, 95% CI)	20 (27.8%) (17.6%, 38.0%)	**40 (55.5%) (43.8%, 67.3%)**	12 (16.7%) (8.1%, 25.2%)	72
Disease (N, %, 95% CI)	9 (11.7%) (4.4%, 18.9%)	12 (15.6%) (7.4%, 23.7%)	**56 (72.7%) (62.6%, 82.9%)**	77
Total	49 (26.6%)	60 (32.6%)	75 (40.8%)	184
Health States (HS) classified by SHQ standard at 3-month	**12-month retest Health States (HS)**			
	Health	Sub-health	Disease	Total
Health (N, %, 95% CI)	**16 (44.5%) (27.4%, 61.5%)**	13 (36.1%) (20.6%, 51.7%)	7 (19.4%) (6.4%, 32.4%)	36

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Sub-health (N, %, 95% CI)	15 (20.3%) (11.2%, 29.5%)	**44 (59.4%)** **(48.1%, 70.9%)**	15 (20.3%) (11.2%, 29.5%)	74
Disease (N, %, 95% CI)	8 (11.8%) (4.0%, 19.6%)	9 (13.2%) (5.0%, 21.4%)	**51 (75.0%)** **(64.4%, 85.6%)**	68
Total	39 (21.9%)	66 (37.1%)	73 (41.0%)	178

Health States (HS) classified by SHQ standard at 6-month	**12-month retest Health Categories**			
	Health	Sub-health	Disease	Total
Health (N, %, 95% CI)	**24 (51.1%)** **(25.2%, 77.0%)**	18 (38.3%) (24.4%, 52.2%)	5 (10.6%) (1.6%, 19.7%)	47
Sub-health (N, %, 95% CI)	16 (22.5%) (12.8%, 32.2%)	**43 (60.6%)** **(50.1%, 71.0%)**	12 (16.9%) (8.2%, 25.7%)	71
Disease (N, %, 95% CI)	8 (10.1%) (3.3%, 16.9%)	13 (16.5%) (8.2%, 24.8%)	**58 (73.4%)** **(63.0%, 83.8%)**	79
Total	48 (24.4%)	74 (37.5%)	75 (38.1%)	197

** Numbers (percent) unchanged in every 3-month retest had been highlighted.*

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6.4.3 Changes in Health Related Quality of Life associated with changes in Health States

Table 6-5 summaries the mean changes (effect sizes) of HRQOL scores associated with the changes of health states over one year. The mean and effect size changes in the HRQOL scores at every 3-month point after baseline were summarized. The effect size difference/change of HRQOL > 0.3 was considered clinically significant. The scores of SF-12v2 PCS, MCS and SF-6D are all significantly improved from Sub-health to Health state, with significant effect sizes of 0.28, 0.50 and 0.52 respectively. The scores of SF-12v2 and SF-6D are significantly increased in which an improvement of 1.98, 3.81 and 0.06 respectively. The scores of SF-12v2 and 6D are impaired significantly except for the PCS of the SF-12v2 in which a deterioration of -3.43 (ES=-0.49) and -0.7 (ES=-0.74) points was found in the MCS of the SF-12v2 and SF-6D, respectively. The greatest improvement of 4.30-point was found in the SF-12v2 MCS score with effect size of 0.43 transforming from Disease to Disease. for both TCM and WMGOPCs patients. Subjects from Health to Sub-health (n=45) had similar impairment in SF-12v2 MCS and SF-6D, except SF-12v2 PCS was associated with smaller effect size -0.25, but the reverse was found in the transforming from

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Sub-health to Health. There was no significant difference in the HRQOL score changes from Sub-health to Disease and Health to Disease.

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Table 6-5 Mean changes (effect size) of HRQOL scores associated with the changes of health states over one year

SHQ Health States	Mean change (effect size) in HRQOL scores		
	SF-12v2 PCS	SF-12v2 MCS	SF-6D
Changed HS			
H → SH (n=45)	-0.97 (-0.25)	-3.43 (-0.49) †	-0.07 (-0.74) ‡
SH → H (n=66)	1.98 (0.28) *	3.81 (0.50) †	0.06 (0.52) ‡
SH → D (n=43)	-0.55 (-0.07)	-0.69 (-0.06)	-0.02 (-0.16)
D → SH (n=26)	-0.03 (-0.002)	3.66 (0.42)	0.05 (0.33) ‡
H → D (n=28)	-1.80 (-0.32)	-1.86 (-0.37)	-0.04 (-0.70)
D → H (n=27)	2.96 (0.33)	4.30 (0.43) †	0.07 (0.52) ‡

Notes:
Effect sizes are generally defined as small (d=0.2), medium (d=0.5) and large (d=0.8). Most previous studies showed that the minimal clinically important difference (MCID) in HRQOL was an effect size of 0.3-0.5.
** - Significant difference in SF-12v2 PCS means between the two groups by paired-sample t-test (* - p<0.05)*
† - Significant difference in SF-12v2 PCS means between two groups by paired-sample t-test († - p<0.05)
‡- Significant difference in SF-6D index between two groups by paired-sample t-test (‡ - p<0.05)

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6.4.4 Changes in Health Service Utilization associated with Changes in Health State and HRQOL

To our best knowledge, the variance of regression model may be explained sufficiently based on the enough large sample size. As discussed above in 5.4.1, previous studies found that a sample size of 176 per group is needed to detect an effect size difference of 0.3 by independent t test, with a power of 80% and a confidence interval of 95% (Florey 1993). The power (1-β error probability) given the sample size in each subgroup in Table 6-5 were not statistically significant ($p>0.05$, $0.80>power>0.45$) for a multi-variable linear regressions of the difference in SF-12v2 scores or total consultation rates on SHQ groups were carried out by *G*Power* 3.1.5 (Erdfelder, Faul et al. 1996; Faul, Erdfelder et al. 2007), controlling for socio-demographic variables, SHQ groups and other service utilization variables. Obviously, the total number of subjects in each subgroup recruited in the one-year longitudinal study may not large enough to analyze by commonly used regression analyses. However, we still may explore the latent relation among Sub-health, HRQOL and consultation rates.

As previous studies (Lam, Fong et al. 2002; Du Cen and Huiqing.

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2003; Wong 2009), the relation between HRQOL scores and consultation rates may theoretically be reversed but it is unlikely. When people had lower HRQOL scores, they consulted medical doctors more because they were ill or somewhat sick. It is logically reasonable to assume that there is a logical link among Sub-health, HRQOL and medical service utilizations. This could be preliminary recognized by the results of either WM or TCM primary care settings by the self-reported consultation rates (see Chapter 5.5.5). For example, an increase in the health service utilization rates associated with significant impairment or reduction in HRQOL of the relevant SF-36 scale scores on by multivariate regression analyses was explored by Lam (Lam and Lauder 2000; Lam, Fong et al. 2002; Lam, Lauder et al. 2003; Lam 2003) and similar outcomes found in TCM clinical settings in Hong Kong (Du Cen and Huiqing. 2003; Wong 2009). It was preliminary recognized that Sub-health placing a significant burden on the health care system and the impact of Sub-health on consultation, hospitalization and medication usage rates deserves more investigations (Du Cen and Huiqing. 2003). Such information is important to guide the estimation of the health service needs of the population, associated with the significant difference or change in HRQOL scores, respectively. HRQOL scores improved significantly after WM or TCM consultation with effect sized greater

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than the MCID of 0.3 SD or above in the general population (Krueger, McClain et al. 2004) (Wyrwich, Bullinger et al. 2005), which is in further support of the 0.3 SD as a benchmark indicator of MCID.

The differential change in the HRQOL scores suggested that the changes were not random measurement variations but an indication of real changes. It was recognized that a clear and real condition treated in primary care both by WM and TCM (Lam and Lauder 2000; Lam, Fong et al. 2002; Lam, Lauder et al. 2003; Wong 2009). A general population survey in Hong Kong found that Western medical service were the main source of health care and 7% of the outpatient health services were provided by Chinese medicine practitioners including herbalist, acupuncturist and bone-setters in the 1999 Harvard Team (William Hsiao and Yip 1999) report on Hong Kong health care reform. In the 2007 Bauhinia Foundation Research Centre report on preliminary findings on Hong Kong's future health care and reported that Western medicine practitioners and Chinese medicine practitioners constituted for designated medical condition, providing choice of providers - Department of Health Hospital Authority for public as well as private WM and TCM services for health care (B.F.R.Centre 2007). And the TCM practitioners constitute the largest group expenditure on outpatient service constitutes around 50% of the

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total health care expenditure for designated medical conditions (B.F.R.Centre 2007), consistent with the 2007 general population census report (HKSAR 2007b). Generic and disease specific HRQOL measures were chosen as an reliable outcome measure suitable for service evaluation as a whole. It was shown that most people consulted for illness or somewhat sickness resulted from their global rating on change in health condition (GRS) score further confirmed the clinical impact of Sub-health condition. The correlations between the changes in HRQOL scores and the GRS was logically significant found by clinical WMP or CMP evaluation and the patients' global rating. This raised a concern that HRQOL may not be the only valid determinant and assessment of the consultation rates of TCM but there is good external construct validity from the magnitude of difference and change between health and disease. And the expected clinical significant difference and change in the scores of HRQOL suggest that the possible association with Sub-health, HRQOL and consultation rates. The lack of correlation suggests that Sub-health and HRQOL assessment measure different aspects of the health. The effects of Sub-health and HRQOL on health service utilization (WM and TCM) seem to be responsive respectively, but this may be converted into one clinical endpoint "consultation rate", which results from a person's perceived need independently.

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6.5 Discussion

6.5.1 Relationship Between Change in Sub-health and Change in HRQOL

To the best of our knowledge, this was the first study to show a relationship between change in Sub-health and change in SF-12v2 and SF-6D scores in a general Chinese population. The change from Sub-health to Health state is significant for the changes in the SF-12v2 and SF-6D scores. However, the change of SF-12v2 PCS score was not statistically significant associated with change from Health to Sub-health state and the absolute effect size is 0.25 (mean change is -0.97). We may assume that HRQOL (SF-12v2 and SF-6D scores) was independent determinant of health service utilization based on previous studies (Lam, Fong et al. 2002). In contrast, the results did not show significant change in HRQOL scores among people who changed from the Sub-health to disease state. This may because people in Sub-health state are already having HRQOL as poor as those in the disease group or may indicate that the impact of change between Sub-health and Health was relatively more clinically important than that of change between Sub-health and Disease. Based

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on the results in the cross-sectional study (Chapter 5, Table 5-7), the effect of change between Sub-health and Health state on health service utilization was relatively small and insignificant. Although HRQOL scores cannot influence behavior, the underlying HRQOL construct may be reflected in the scores. So we may assume that the association between health service utilization and the SF-12v2 and SF-6D scores was relatively big. Outpatient consultations are often more dependent on person's subjective need than dependent on objective clinical indicators like diagnosis and the severity of problem. Sub-health questionnaire (SHQ) is designed for the classified different health states, therefore may have a relatively smaller interval in HRQOL scores between Sub-health and Health than that between Sub-health and Disease. The SHQ may be more suitable for classifying health states, especially for determining Sub-health. More research is required to identify any other important determinants and related health service utilization. HRQOL measured by the SF-12v2 and SF-6D was an important determinant of service utilization rates for change between Health and Sub-health but may not for change between Sub-health and Disease.

Although HRQOL and health service utilization might be closely related in that the presence of Sub-health might impair HRQOL and

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adverse HRQOL might predispose to diseases especially Sub-health problems/symptoms. People with Sub-health are more likely to have a request for medication/treatment, especially when changing between Health and Sub-health that related to clinically significant impairment in HRQOL. They may share different medical resources in primary care settings and HRQOL may have different effects on different services, as found in previous study in Hong Kong (Lam, Fong et al. 2002; Wong 2009). Theoretically, Sub-health can be used as a determinant for medical consultation, which may be applicable to Hong Kong in the future medical service orientation and treatment evaluation, especially for TCM service. TCM-specific medication or treatment may be used for people with Sub-health considering his/her BC subtype instead of TCM syndrome ("*zheng* (證)") for disease-focused services. Another possible positive predictive value of the recognition of Sub-health is to restore health as possible as early. The TCM early intervention/ individualized "maintenance self-care plan" (e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿）and dietary supplement etc.) can be given to restore health if health service is to be truly intended to promote person-centered health instead of only disease focused

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treatments. The standard diagnosis of Sub-health is still underway and when it has been established it will be possible to study if the Sub-health is an independent determinant of the health service utilization. Moreover, Nelson et al (Nelson, McHorney et al. 1998) pointed out that self-reported rates should not be taken as the actual consultation rates but merely an indication of the health service utilization pattern because it is more likely to be over-reported based on subjects' recall of doctor's diagnosis. It was expected that such inflating errors to have few effect on the results of our studies, especially for the health service utilization study on Sub-health. We try to reduce these systematic bias or recall errors that could affect our hypotheses and conclusions to some degrees. More comprehensive longitudinal studies will be required to sort out the complex causal relationships among change in Sub-health and/or change in HRQOL perception and health service utilizations.

6.5.2 Clinical Important Difference (CID) of HRQOL Anchored on Change in Health State

Up to date, there is no single, standard and optimal method to define CID in HRQOL assessment. However, the anchor-based approach and

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the distribution-based approach are strongly advocated for clinical studies by clinicians and researchers to order to define clinical meaningful change.

The anchor-based approaches compare observed differences relative to an external standard that have clinical relevance, that have been used to determine CID through cross-sectional and longitudinal methods (Crosby, Kolotkin et al. 2003). Population-focused anchors for interpreting HRQOL change indicate significant differences on populations (Wyrwich, Bullinger et al. 2005). HRQOL domain or summary scores of one group can be calculated in terms of different health states or some disease-related criterion (e.g. irritable bowel syndrome, IBS). Prospectively measured change in HRQOL can be explored by change in a clinical parameter (e.g. doctor consultation, use of drugs, doctor global rating, patient global rating on change/overall health, or patient satisfaction on change/overall health).

Some drawbacks have been identified with the anchor-based method e.g. patients do not remember their pre-test health condition/status when making their global ratings; the arbitrary appraisal manner in choosing the minimal, moderate and large change levels, and clinical

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validation in patient-perceived transitional change is still not confirmed.

One cross-sectional method is the study of the life span involving comparison of individual groups with and without a particular diagnosis (health, Sub-health or disease). The difference in mean values of the HRQOL instrument across groups is used to estimate the CID among different groups (Crosby, Kolotkin et al. 2003). A second cross-sectional method for defining CID is to integrate HRQOL with some external non-disease-related criteria, such as consultation and hospitalization rates.

The global ratings of change in longitudinal studies is one commonly used anchor-based approach for establishing CID (Crosby, Kolotkin et al. 2003), which mainly includes doctor consultation, use of drugs, doctor global rating, patient global rating on change/overall health, or patient satisfaction on change/overall health. Change in Health state may be used as an anchor for CID, especially change between Sub-health and health state.

Distribution-based approaches to determine CID are based on the statistical characteristics of the sample, recommended by HRQOL

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professionals for their additional clinical interpretations (Wyrwich, Bullinger et al. 2005). Distribution-based approaches rely on relating the differences between known groups (e.g. people with or without diseases, consultation or not, chronic or acute disease, placebo and treatment groups in a clinical trial) to some measures of variability, comparing the change over time in one group to the standard deviation (SD) at baseline (Hays and Woolley 2000). Different indicators have been proposed: the effect size (ES) (change divided by baseline standard deviation) (Wewers and Lowe 1990), which can be correlated with Cohen's (Krueger, McClain et al. 2004) classification (small, moderate and large effects); the standard error of the measurement (SEM) which evaluate change in relation to variation of the instrument provides a tolerance of an estimate of a sample (Wyrwich, Bullinger et al. 2005) and the standardized response mean (SRM) which is the mean change score per item divided by its SD (Zou 2005).

These two general methods (anchor-based and distribution-based approaches) were used and produced similar results for clinical significance (Lam 2003). The agreement between the results derived from the both methods relies on the Empirical Rule Effect Size (ERES) approach in that one QOL tool range is about 6 Standard Deviations

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(SD), thus 1 SD Estimate is equivalent to 16.7% of theoretical range (Beaton, Bombardier et al. 2001; Norman, Sloan et al. 2003; Sloan and Dueck 2004). Although there is no single, optimal solution to determining CID in HRQOL scores, it is recommended that the threshold of CID is approximately 0.5 SD (about 8% of the theoretical range of scores) (Wright 2003; FDA 2006). Meanwhile, it is strongly helpful to use diverse approaches to define whether concordance among methods confirms the choice of a CID (FDA 2006).

The global ratings of change in longitudinal studies is one commonly used anchor-based approach for establishing CID (Crosby, Kolotkin et al. 2003), which mainly includes doctor consultation, use of drugs, doctor global rating, patient global rating on change/overall health, or patient satisfaction on change/overall health.

More comprehensive longitudinal studies will be required to estimate the CID in HRQOL perception anchored on change in health state, especially change between health and Sub-health.

6.5.3 Limitations

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This study was conducted by telephone interview in Hong Kong so that results may not be representative enough for face-to-face interview of primary care services especially those with seriously ultimate illness. The follow-up period of 3 months might not be able to capture the real consultation rates because the recall errors. The sample size of subjects who completed all follow-ups was not large enough and it was hard to be sure that the change in HRQOL was truly the result of the change in Health state, a natural history of the Sub-health or illnesses. Without a no-treatment control or placebo group it was also difficult to exclude the effect of medical consultations on the change in HRQOL.

We have not analyzed the relation among change of Sub-health, change of HRQOL and change of health service utilization by multivariable regression analysis because it consists of a relatively small sample size.

The characteristics of the three groups of subjects at different time slots (baseline, 3-month, 12-month) are shown and compared to the Hong Kong general population (2006) in Table 6-1. Subjects had a wide range of age from 18 to 89 years old at the beginning or the longitudinal study and 18-77 years old when the whole study

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completed, and were generally old than the 2006 general population (mean age 46, 45 vs. 40 years). The sex distribution of our samples was more likely to be female, in comparison with the 2006 Hong Kong general population. The educational level of our samples was more likely to be higher compared with the Hong Kong general population in 2006. The marital status of our samples was more likely to be married, in comparison with the Hong Kong general population. The income range of our samples was more likely to be higher compared with the Hong Kong general population.

Table 6-1 compares the sociodemographic characteristics of the sample in the longitudinal study to that of the Hong Kong General Population 2006 By-census (Census & Statistics Department Hong Kong, 2006). The proportion of young adults was lower and that of the elderly was higher than those of the By-census. The proportion of males was lower and that of the females was higher than those of the By-census. The distribution in occupation of our subjects was not directly comparable to that of the By-census in that different classification methods of occupation were applied. We used the British Registrar General classification of occupation in order to indicate social class (General Registrar Office, 1966) instead of the International Standard Classification of Occupation used by

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By-census. Therefore, this sample may not representative of the general Hong Kong population and the results may not be applicable to the general Hong Kong population. A limitation of this telephone survey method was that housewives, retired people and unemployed people have more chance stayed home most of the time. The other possible limitation is that around 10% of the households whose numbers were not listed in the telephone directories. These might be the causes of a relatively higher proportion of elderly subjects and females. This bias might have affected the reported utilization rates but should not have much effect on the results of the regression analyses in this study that were controlled for sociodemographic variables. We expected such bias to be consistent for all subjects and not to have any effect on the conclusions.

The key problem of this study was that nobody knew who changed their HS and when they changed. Any subject may be double counted in this analysis because the health state may be changed during a one-year period. And any subject may not complete all 3-month follow-ups and he/she may skip any slot during the whole year. The same people were moving back and forth, or everybody was moving into and out of these different health states over time. There were very important questions that the analysis cannot answer because we really

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had very little idea of what was happening. Simply looking at different proportions in different categories over time was crude but informative for pre-trial.

6.6 Summary

This was the first study showing a linear relationship among change in Sub-health, change in HRQOL and health service utilization on a Chinese population in Hong Kong. It attempted to explore the clinical relevance of the Sub-health to a culture and health care system that is different from that of the mainland China where the concept originated. It suggested that the concept of Sub-health can be differentiated from other states, but the clinical relevance is still arguable. This calls for the advocacy of intervention or Sub-health when HS change from SH to Health state by double-blind randomized controlled trials to establish valid scientific evidence to inform the clinical significance of Sub-health.

The summarized transition patterns for SHQ model estimates the probability of an individual being in each health state on 5 occasions,

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which provides 3^5 possible patterns for describing each state transitions. We summarized these patterns into a smaller number of discrete trajectories. The probability of an individual having a particular state trajectory is the sum of the probabilities of belonging to the transition patterns that make up that trajectory.

Our study of health summarizing transition trajectories paints a possible picture of Health-SH-Disease continuum. Nearly one third of Sub-health individuals are more likely to be stable over time. This finding suggests that it is important for future Sub-health research to consider the associations between individual HRQOL change and change of health state. However, our rudimentary observation raised intriguing questions about what factors, when and how they process SH individuals with improved change and declining change. The stable SH pattern shows that SH may be persistent state like sustain disease state. The answers to these questions may be helpful to prove that SH is a stably intermediate state between health and disease.

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Chapter 7

Conclusion and Recommendation

In the Chinese medical texts, the perfect health state "陰平陽秘，精神乃治 (If the Yin and Yang energies of a man being kept in a state of equilibrium, his body will be strong and his spirit sound)" was documented in Sheng Qi Tong Tian Lun of *Huangdi Neijing* (黃帝內經-素問生氣通天論) (Wang 2000) to describe a normal state of Yin-Yang equilibrium. This normal state was also described as "平人者不病也 (People of four or five times of pulse beats in a respiration is called a normal person who has no disease)" in Ping Ren Qi Xiang Lun of *Huangdi Neijing* (黃帝內經-素問平人氣象論) (Wang 2000). This description has met the WHO "health" concept as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO 1947)."

It has been recognized that many people without any disease do not have full health. The term Sub-health (SH) has been used to describe an intermediate state between health and disease. According to a

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survey by China News Agency (Beijing), 75% of the Chinese population did not have optimal health, especially in large cities like Beijing and Shanghai (Wang 2005). It was estimated that 56% Hong Kong population suffered from sub-optimal health and most of them were in their 20-40s (Xie Yanming, Liu Baoyan et al. 2006; Liu Baoyan, He Liyun et al. 2007; Welfare 2010).

There is still some uncertainty on the differentiation between the three health states (Health, Sub-health and Disease) because of a lack of objective physiological or pathological indicators of health and Sub-health. However, the clinical significance of Sub-health is particularly important and necessary. Health-related quality of life (HRQOL), based on the same WHO health concept as Sub-health, is a valid outcome measure to evaluate the validity and significance of Sub-health. It gives an indication on whether Sub-health is a distinct state from health or disease in terms of its impact on the person's life, which will then justify medical attention.

An important measure of clinical significance is health service utilization. The impact of Sub-health on consultation, hospitalization and medication usage rates is not known. Such information is

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important to guide the estimation of the health service needs of the population. The Sub-health impact is even greater in clinical populations.

This chapter summarizes the key findings on the relationship between Sub-health and Health-related Quality of Life (HRQOL), as well as health service utilization. The limitations of the research findings and areas for future research are also discussed.

7.1 Key Findings

7.1.1 The Sub-health Questionnaire (SHQ)

The Sub-health Questionnaire (SHQ), base on the WHO health definition and the TCM "Not-yet-ill" concept, was developed and shown to have sufficient content and construct validity and reliability as an instrument for classifying people into different health states. 8 items were generated to form two health state (HS) scales (health and Sub-health) from a literature review on the health concept, the

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Chinese medicine concept of Sub-health and "Not-yet-ill" (China Association of Chinese Medicine. 2006; Li Xueling, Han Ninglin et al. 2010) and medically unexplained symptoms (Lombardo and Nezu 2005) and diagnostic criteria of disease (Australian Institute of Health & Welfare 2010; WHO 2010). An expert panel evaluated the face validity of the first draft SH items, revisions were made to the wording and lay out. The 8 items were grouped into two HS scales, combined with a module on doctor consultation and a module on chronic morbidity to form the second draft SHQ, consisting of 20 items grouped under 6 questions. In general, our study indicated that the SHQ is conceptually valid with confirmed content validity. To date, the psychometric properties of the instrument have been tested at a point in time only, permitting evaluation of the SHQ to discriminate among known groups and to test the measurement model, internal consistency, construct validity and responsiveness. SHQ is now ready to be used for future studies.

7.1.2 Relationship between Sub-health and HRQOL

How Sub-health and its impact on health-related quality of life is important to Sub-health individuals and their significant others,

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clinicians, researchers, and administrators of health care systems. SHQ was used to investigate the impact of Sub-health on health-related quality of life.

The recognition of Sub-health is important so that early intervention/ individualized "maintenance self-care plan" (e.g. *Qi Gong*（氣功）, *Tai Chi*（太極）, Chinese herbal tea and TCM dietetic therapy（中醫食療）, TCM acupuncture, TCM moxibustion, *Tuina* of TCM（中醫推拿）and dietary supplement etc.) can be given to restore health if health service is to be truly intended to promote person-centered health instead of only disease focused treatments. People were classified by SHQ into health, Sub-health and disease groups successfully. The prevalence of Sub-health is 40.67% (484 subjects of the total 1231) in Hong Kong Chinese population. And there were significant differences in SF-12v2 summary scores (PCS & MCS) and SF-6D between groups classified by the SHQ, which supporting our research hypothesis that Sub-health group should have higher scores than those of disease group and lower scores than those of health group. Not only impair the HRQOL, Sub-health also resulted in repeated consultations and more medical resource expenditure. Using the results of SHQ classification system, it is applicable to compare

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the consultation rates between WMP and CMP easily.

Our study provides preliminary evidence on the existence of Sub-health and the clinical significance of Sub-health. The epidemiology, clinical significance of the Sub-health state and Health-related Quality of life (HRQOL) measured by the SF-12v2 have been investigated in Hong Kong. 1231 Chinese adults randomly selected from the general population were interviewed by telephone survey with the SHQ, SF-12 Health Survey and a structured questionnaire on demographics and service utilization. The results would be useful in a large number of general populations worldwide to identify the Sub-health epidemiology, provide evidence supporting the conceptual bases for Sub-health, compare for HRQOL of people in similar health states (e.g. MUS) and manage the Sub-health based on TCM BC classification. They also can give an estimate on the clinical important difference (CID) (Hays and Woolley 2000; Hays, Farivar et al. 2005; de Vet, Ostelo et al. 2007) in HRQOL anchored on the difference between the healthy and Sub-health state, and between Sub-health and disease state.

Based on the WHO health impact assessment (HIA) (WHO 2012), many determinants combine together to affect the health states of

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individuals and communities. To a large extent, factors such as 1) the social and economic environment, 2) the physical environment, and 3) the person's individual characteristics and behaviors all have considerable impacts on health, whereas the more commonly contribute to the complexity and transition of health states rather than there is simply one continuum: health-SH-disease. The context of people's lives determine their health and many common factors (like income and social status, education, physical environment, social support networks, genetics, health services, gender, age et al.) may influence the perception and transition of health. Conceptually, there is an overlapping relationship between the different concepts, as shown in the Figure 1-1.

Conceptually, there seems one continuum: health-Sub-health-disease, and continua which determine HRQOL and consultation behavior (see Figure 1-1). The one-year longitudinal research examined the changes of HRQOL associated with the changes of SHQ states, especially the change between Sub-health and Healthy states. It shows a linear relationship among change in Sub-health, change in HRQOL and health service utilization on a Chinese population in Hong Kong. Also, it preliminary explores the clinical relevance of the Sub-health to a culture and health care system that is somewhat similar from that of

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the mainland China where the concept originated.

This telephone survey relied on the patients' subjective reporting of disease and service utilization without objective validation by doctors. Some people classified as Sub-health could have a sub-clinical disease, and there could be recall bias in the reporting of service utilization rates. Further studies comparing the SHQ classification against the doctor's diagnosis and service utilization records should be done to confirm the accuracy of our results.

A limitation of our analysis was that it excluded the adults who could not be classified by SHQ, therefore, the results may not be applicable to these "unclassifiable" people. This bias might have affected the reported utilization rates and HRQOL but should not have much effect on the results of the regression analyses that were controlled for sociodemographic variables.

Another limitation in the cross-sectional study is the possible problem of reverse causality bias in determining cause and effect of Sub-health. As discussed already, the SF-12v2 mental component summary score (MCS) of people with Sub-health was even lower than that of the disease group indicating significant mental stress. People can be

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worrying and depressing for their subjective symptoms, especially if the doctor find no cause to explain their health problem. The other possible explanation is that people with mental stress are more likely to perceive symptoms and problems (Kleinman 1982). However, the emotional factors, such as fear or anxiety, may lead to incorrect perception of illness severity, a delay in seeking medical help (Rizzardo, Borgherini et al. 1991) (Lo, Hedley et al. 1994), or even treatment refusals (Connelly and Campbell 1987) (Lo, Hedley et al. 1994). Since the fundamental cause of the psychosomatic symptoms is not find out, it is not surprising that Sub-health somatization problems persist and impair the HRQOL.

7.2 Implications of Results and Future Studies

The Sub-health and HRQOL have been found to be significantly correlated with health service utilization in a cross-sectional study. Prospective study on the prediction of the causal relationship between Sub-health and HRQOL scores on future consultation and hospitalization rates will need to be done to further confirm whether it is clinically useful for health service management and medical resource allocation.

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As discussed in Chinese medicine contexts, Chinese medicine practitioners (CMP) can assess the symptom/problem due to efficiency or deficiency of either Yin and Yang with the TCM four examinations (中醫四診法) (Qinghong 2004). The Chinese Medicine Practitioner (CMP) usually makes individualized prescription based on an overall assessment on patient's health condition. Particularly, the Body Constitution (BC 體質) differentiation for the patient is very significant in TCM. BC is partly genetically determined but partly modifiable by the environment.

A person's BC is unique to each other. It can be broadly divided into balanced and imbalanced states (WHO 2007). BC is a conceptually latent indicator of Sub-health. The Sub-health concept infers preventive measures should be taken before the occurrence of disease by classified people into balance and imbalanced BC (WHO 2007; 岑澔 and 王琦 2007; Haiwei 2009; Xiaoning and Fangshi 2009). People with BC imbalance have Sub-health resulting in symptoms or dysfunctions although they do not have any detectable disease (岑澔 and 王琦 2007; Zhimin, Li et al. 2009). However, there is still no official acknowledged standard for BC classification. Based on this literature review, we may conclude that 9-type BC system summarized

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by Wang Qi is well-known and frequently used in the SH studies to classify different BC types (Qi 2005; 岑澔 2007; 岑澔 and 王琦 2007; Qi and Yanbo 2009; Zhimin, Li et al. 2009; 楊志敏, 黃鸝 et al. 2009). Related studies were still going on in Hong Kong combined with SHQ classification system, HRQOL and BC instruments. The results can then be used to tailor-make health promotion Chinese medicine treatments according to individual body constitutions. SHQ can be used in our future research in relation to Sub-health and Chinese medicine Body Constitution classification system.

The concepts of Sub-health, Not-yet-ill and Yin-Yang imbalance in TCM and that of MUS and non-disease in WM may be similar and overlapping conditions. The use of the SHQ as a standard definition of Sub-health should be useful for clinical diagnosis in TCM or WM practices, and future research on the management of these conditions.

Furthermore, studies that anchor the changes in the HRQOL scores to person's change in health state or other important clinical parameters may be used to determine the clinically important difference (CID). I hope this research can make a contribution to medical east-west collaboration ("*integrative medicine* (中西醫結合)").

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香港大學圖書館 HKU Libraries

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Appendices

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Appendix A

Subject no.: _____

年齡：_____

性別：_____

開始時間:_____

亞健康問卷 (SHQ)

說明：

這項調查是詢問您的健康狀況和您日常生活的情況。

請回答下列每一個問題。問題並沒有對或錯的答案。

如果您對某一個問題不能做出肯定的回答，請按照您的理解選擇最合適的答案。

1. 如果用下列的句子來形容您<u>在過去四個星期裏</u>的健康情況，您認為有多正確？

	肯定對	大致對	不知道	大致不對	肯定不對
a. 您的身體健康狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您的情緒和精神狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您有充足的精力	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 您在日常的社交活動裏表現良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix A

Subject no.: _____

2.<u>在過去四個星期裏</u>，您的日常工作或生活有多少時間會因為以下的問題而受到妨礙？

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 與家人、朋友、同事或其他人的社交活動有任何困難	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

結束時間:_____

感謝您的參與!

香港大學圖書館 HKU Libraries

Appendix A

Subject no.: _____

Your age at last birthday:_____

Your sex is male/ female

Starting time:_____

SUB-HEALTH QUESTIONNAIRE (SHQ)

INSTRUCTIONS

This survey asks about your health and how well you are able to do your usual activities. Please answer every question. There is no right or wrong answer.
If you are unsure about how to answer a question, please give the best answer you can.

1. **How TRUE or FALSE is <u>each</u> of the following statements in describing your health status <u>in the past four weeks</u>,?**

	Definitely true	Mostly true	Not sure	Mostly false	Definitely false
a. Your physical health condition was good.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Your mental and emotional condition was good.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. Your energy was good.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. You were able to carry out your usual social activities well.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix A

Subject no.: _____

2. How much of the time <u>during the past 4 weeks</u> have your daily function or activities been interfered by each of the following?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. Any physical symptom such as bodily pain, gastrointestinal discomfort, insomnia or headache, etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Any emotional or psychological symptom such as feeling anxious, frightened, unhappy, depressed, or irritable, etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. Feeling a lack of vitality such as easy fatigue, poor concentration, or slow in response, etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. Any difficulty in social interactions with family, friends, colleagues or other people.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

End time:_____

Thank you for participating in this study

香港大學圖書館 HKU Libraries

Appendix B

調查編號：_____

調查日期：____年____月____日

調查員號碼：_____

說明：

這項調查是詢問您的健康狀況和您日常生活的情況。請回答下列每一個問題。問題並沒有對或錯的答案。 如果您對某一個問題不能做出肯定的回答，請按照您的理解選擇最合適的答案。

第一部分：亞健康問卷 (SHQ)

1. 如果用下列的句子來形容您<u>在過去四個星期裏</u>的健康情況，您認為有多正確？

	肯定對	大致對	不知道	大致不對	肯定不對
a. 您的身體健康狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您的情緒和精神狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您有充足的精力	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 您在日常的社交活動裏表現良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix B

2.<u>在過去四個星期裏</u>，您的日常工作或生活有多少時間會因為以下的問題而受到妨礙？

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 與家人、朋友、同事或其他人的社交活動有任何困難	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

3. 請問您有沒有經由醫生診斷患有以下任何一種疾病 (多過四星期以上)：

a. 血壓高
1.有
2.沒有
3.唔知

b. 糖尿
1.有
2.沒有
3.唔知

c. 心臟毛病
1.有
2.沒有
3.唔知

d. 中風
1. 有
2. 沒有

香港大學圖書館 HKU Libraries

Appendix B

3. 唔知

e. 哮喘/肺氣腫/慢性支氣管炎或其他慢性的胸肺病
1. 有
2. 沒有
3. 唔知

f. 慢性的關節或風濕病
1. 有
2. 沒有
3. 唔知

g. 抑鬱病，神經衰弱或其他精神病
1. 有
2. 沒有
3. 唔知

h. 其他重要疾病
1. 有，請說明：_____
2. 沒有
3. 唔知

香港大學圖書館 HKU Libraries

Appendix C

Subject # _____

COGNITIVE DEBRIEFING Questions
-English & Hong Kong (Chinese) Sub-health Questionnaire (SHQ)

General Impression:

1. *Are the questions generally clear, easy to understand, easy to answer?*
   總括來說，這些問題是否清晰、容易理解和容易回答？

   1) Yes 是
   2) No, please explain 否，請說明: _____

2. *Overall, is the measure relevant to your situation? (Are the items meaningful and important to you?)*
   總而言之，這份問卷是否與你有關？ (它的項目是否有意思和對你是重要的？)

   1) Yes 是
   2) No, please explain 否，請說明: _____

3. *Are the instructions clear and easy to understand?*
   問題的指引是否清晰及容易理解？

   1) Yes 是
   2) No, please explain 否，請說明: _____

4. *Is the format easy to follow? (Is it easy to complete on your own?)*
   格式是否清楚明白？ (自己完成問卷有沒有困難？)

   1) Yes 是
   2) No, please explain 否，請說明: _____

香港大學圖書館 HKU Libraries

Appendix D COGNITIVE DEBRIEFING OF ITEMS IN ENGLISH & HONG KONG (CHINESE) Subject No.: _____

Item 項目	**Did you have any difficulty understanding this item?** *(eg Yes, No, A little, A lot)* 你在理解此項目時有沒有困難**?**	**What does this item mean to you?** *(Please put what the respondents said it means in their own words)* 你認為這項目是甚麼意思？	**Would you reword this item?** *(If so, how would you reword it?)* 你認為需要改寫此項目嗎？ **(**如有需要，你會如何改呢？**)**	**Is this item relevant to HEALTH?** 此項目是否與健康有關呢？	**If the response options are not clear and consistent with this item, how would you reword them?** 如果答案的選擇並不清晰或與題目不配合，你會怎麼改寫它呢？

香港大學圖書館 HKU Libraries

Appendix D COGNITIVE DEBRIEFING OF ITEMS IN ENGLISH & HONG KONG (CHINESE) Subject No.: _____

Item 項目	**Did you have any difficulty understanding this item?** *(eg Yes, No, A little, A lot)* 你在理解此項目時有沒有困難**?**	**What does this item mean to you?** *(Please put what the respondents said it means in their own words)* 你認為這項目是甚麼意思？	**Would you reword this item?** *(If so, how would you reword it?)* 你認為需要改寫此項目嗎？ **(**如有需要，你會如何改呢？**)**	**Is this item relevant to HEALTH?** 此項目是否與健康有關呢？	**If the response options are not clear and consistent with this item, how would you reword them?** 如果答案的選擇並不清晰或與題目不配合，你會怎麼改寫它呢？
亞健康問卷 **(SHQ)**					NA
說明： 這項調查是詢問您的健康狀況和您日常生活的情況。					NA
請回答下列每一個問題。問題並沒有對或錯的答案。					NA
如果您對某一個問題不能做出肯定的回答，請按照您的理解選擇最合適的答案。					NA
如果用下列的句子來形容您在<u>過去四個星期裏</u>的健康情況，您認為有多正確？					

香港大學圖書館 HKU Libraries

Appendix D COGNITIVE DEBRIEFING OF ITEMS IN ENGLISH & HONG KONG (CHINESE) Subject No.: _____

Item 項目	**Did you have any difficulty understanding this item?** *(eg Yes, No, A little, A lot)* 你在理解此項目時有沒有困難**?**	**What does this item mean to you?** *(Please put what the respondents said it means in their own words)* 你認為這項目是甚麼意思？	**Would you reword this item?** *(If so, how would you reword it?)* 你認為需要改寫此項目嗎？ **(**如有需要，你會如何改呢？**)**	**Is this item relevant to HEALTH?** 此項目是否與健康有關呢？	**If the response options are not clear and consistent with this item, how would you reword them?** 如果答案的選擇並不清晰或與題目不配合，你會怎麼改寫它呢？
a. 您的身體健康狀態良好					
b. 您的情緒和精神狀態良好					
c. 您有充足的精力					
d. 您在日常的社交活動裏表現良好					
肯定對 大致對 不知道 大致不對 肯定不對					
2.<u>在過去四個星期裏</u>，您的日常工作或生活有多少時間會因					

香港大學圖書館 HKU Libraries

Appendix D COGNITIVE DEBRIEFING OF ITEMS IN ENGLISH & HONG KONG (CHINESE) Subject No.: _____

Item 項目	**Did you have any difficulty understanding this item?** *(eg Yes, No, A little, A lot)* 你在理解此項目時有沒有困難**?**	**What does this item mean to you?** *(Please put what the respondents said it means in their own words)* 你認為這項目是甚麼意思？	**Would you reword this item?** *(If so, how would you reword it?)* 你認為需要改寫此項目嗎？ **(**如有需要，你會如何改呢？**)**	**Is this item relevant to HEALTH?** 此項目是否與健康有關呢？	**If the response options are not clear and consistent with this item, how would you reword them?** 如果答案的選擇並不清晰或與題目不配合，你會怎麼改寫它呢？
為以下的問題而受到妨礙？					
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）					
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）					
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）					
d. 與家人、朋友、同事或其他人的社交活動有任何困難					

香港大學圖書館 HKU Libraries

Appendix D COGNITIVE DEBRIEFING OF ITEMS IN ENGLISH & HONG KONG (CHINESE) Subject No.: _____

Item 項目	**Did you have any difficulty understanding this item?** *(eg Yes, No, A little, A lot)* 你在理解此項目時有沒有困難**?**	**What does this item mean to you?** *(Please put what the respondents said it means in their own words)* 你認為這項目是甚麼意思？	**Would you reword this item?** *(If so, how would you reword it?)* 你認為需要改寫此項目嗎？ **(**如有需要，你會如何改呢？**)**	**Is this item relevant to HEALTH?** 此項目是否與健康有關呢？	**If the response options are not clear and consistent with this item, how would you reword them?** 如果答案的選擇並不清晰或與題目不配合，你會怎麼改寫它呢？
常常如此 大部分時間 有時 偶爾 從來沒有					

Please return the Consent form, completed questionnaire and Cognitive debriefing table to Wenwei Huang.

感謝您的參與!

香港大學圖書館 HKU Libraries

Appendix E

第一部分：亞健康問卷 (SHQ)

說明：

亞健康是指人體處於健康和疾病之間的一種狀態。

1. 如果用下列的句子來形容您在過去四個星期裡的健康情況，您認為有多正確：

請“√”出最適合您的情況的答案

	肯定對	大致對	不知道	大致不對	肯定不對
a. 您的身體健康狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您的情緒和精神狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您有充足的精力	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 您在日常的社交活動裏表現良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix E

2. 在過去四個星期裡，您有多少時間會有以下的問題？

請“√”出最適合您的情況的答案

	常常如此	大部分時間	間中	很少時間	從來沒有
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 與家人、朋友、同事或其他人的社交活動有任何困難	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	有	沒有	唔知
3. 您有沒有因為以上健康問題看醫生 (如果 “有”, 請回答 4 和 5 項） _____	☐ 1	☐ 2	☐ 3
4. 醫生有沒有說是什麼病引起的 (如果 “有”, 請說明是什麼疾病) _____	☐ 1	☐ 2	☐ 3
5. 醫生有沒有說是什麼原因引起的 (如果 “有”, 請說明是什麼疾病) _____	☐ 1	☐ 2	☐ 3

香港大學圖書館 HKU Libraries

Appendix E

6. 請問您有沒有經由醫生診斷患有以下任何一種疾病 (多過三個月以上)：

請“√”出最適合您的情況的答案

	有	沒有	唔知
a. 血壓高	☐ 1	☐ 2	☐ 3
b. 糖尿	☐ 1	☐ 2	☐ 3
c. 心臟毛病	☐ 1	☐ 2	☐ 3
d. 中風	☐ 1	☐ 2	☐ 3
e. 哮喘/肺氣腫/慢性支氣管炎或其他慢性的胸肺病	☐ 1	☐ 2	☐ 3
f. 慢性的關節或風濕病	☐ 1	☐ 2	☐ 3
g. 抑鬱病，神經衰弱或其他精神病	☐ 1	☐ 2	☐ 3
h. 惡性腫瘤	☐ 1	☐ 2	☐ 3
i. 其他重要疾病 **(訪問員請注意: 如果被访者回答 “有”, 請說明是什麼疾病)**	☐ 1 _____ _____ _____ _____	☐ 2	☐ 3

香港大學圖書館 HKU Libraries

Appendix E

Section 1 : SUB-HEALTH QUESTIONNAIRE (SHQ)

INSTRUCTIONS

Sub-health State (SHS) is an intermediate state between health and disease.

This survey asks about your health and how well you are able to do your usual activities. Please answer every question. There is no right or wrong answer. If you are unsure about how to answer a question, please give the best answer you can.

1. How TRUE or FALSE is each of the following statements in describing your health status in the past four weeks?

Please '√' the answer that is most appropriate to your situation

	Definitely true	Mostly true	Not sure	Mostly false	Definitely false
a. Your physical health condition was good.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Your mental and emotional condition was good.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. Your energy was good.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. You were able to carry out your usual social activities well.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix E

2. How much of the time <u>during the past 4 weeks</u> you have the following problem(s)?

Please '√' the answer that is most appropriate to your situation

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. Any physical symptom such as bodily pain, gastrointestinal discomfort, insomnia or headache, etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Any emotional or psychological symptom such as feeling anxious, frightened, unhappy, depressed, or irritable, etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. Feeling a lack of vitality such as easy fatigue, poor concentration, or slow in response, etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. Any difficulty in social interactions with family, friends, colleagues or other people.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	yes	no	don't
3. Did you consult a doctor for the above health problem (if 'yes', please answer '4'& '5') _____	☐ 1	☐ 2	☐ 3
4. Have a doctor said what disease caused that (if 'yes', please specify) _____	☐ 1	☐ 2	☐ 3
5. Have a doctor said what reason caused that (if 'yes', please specify) _____	☐ 1	☐ 2	☐ 3

香港大學圖書館 HKU Libraries

Appendix E

6. Have you ever been diagnosed by a doctor to have any of the following diseases for more than four weeks?

Please '√' the answer that is most appropriate to your situation

	yes	no	don' t know
j. hypertension	☐ 1	☐ 2	☐ 3
k. diabetes mellitus	☐ 1	☐ 2	☐ 3
l. any heart disease	☐ 1	☐ 2	☐ 3
m. stroke	☐ 1	☐ 2	☐ 3
n. asthma, emphysema, chronic bronchitis or other chronic lung diseases	☐ 1	☐ 2	☐ 3
o. arthritis or other chronic joint problems	☐ 1	☐ 2	☐ 3
p. depression, anxiety, euraesthenia or psychosis	☐ 1	☐ 2	☐ 3
q. cancer	☐ 1	☐ 2	☐ 3
r. any other major disease **(Note: If the respondents answer 'yes', please specify)**	☐ 1	☐ 2	☐ 3

香港大學圖書館 HKU Libraries

Appendix F

香港亞健康狀況問卷調查

此項研究由香港大學家庭醫學部舉辦

引言

我是代表香港大學家庭醫學部進行此訪問研究來收集香港人的亞健康狀況和使用醫療服務的情況。這個訪問只需大約十分鐘。參加者提供的所有資料將會絕對保密,只供研究用途。

現在可否請您們家裏即將生日的 18 歲或以上的人士接受訪問? 謝謝！”)

這份問卷有些問題可能類似, 但請您回答所有提問。問題的答案並沒有【對】或【錯】之分。如果您對某一個問題不能做出肯定的回答，請按照您的理解儘量選擇。

A.	**性別**	男 女
B.	**請問您上一次生日的年齡是?**	_____ 歲 (不詳者/ 拒絕作答 = 99) （<18 歲 -“現在可否請您們家裏即將生日的成年人士接受訪問? 謝謝！”）

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Appendix F

第一部分：亞健康問卷 (SHQ)

說明：

亞健康是指人體處於健康和疾病之間的一種狀態。

1. 如果用下列的句子來形容您在過去四個星期裡的健康情況，您認為有多正確：

請“√”出最適合您的情況的答案

	肯定對	大致對	不知道	大致不對	肯定不對
a. 您的身體健康狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您的情緒和精神狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您有充足的精力	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 您在日常的社交活動裏表現良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

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2. 在過去四個星期裡，您有多少時間會有以下的問題？

請“√”出最適合您的情況的答案

	常常如此	大部分時間	間中	很少時間	從來沒有
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 與家人、朋友、同事或其他人的社交活動有任何困難	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	有	沒有	唔知
3. 您有沒有因為以上健康問題看醫生 (如果 “有”, 請回答 4 和 5 項） _____	☐ 1	☐ 2	☐ 3
4. 醫生有沒有說是什麼病引起的 (如果 “有”, 請說明是什麼疾病) _____	☐ 1	☐ 2	☐ 3
5. 醫生有沒有說是什麼原因引起的 (如果 “有”, 請說明是什麼疾病) _____	☐ 1	☐ 2	☐ 3

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Appendix F

6. 請問您有沒有經由醫生診斷患有以下任何一種疾病 (多過三個月以上)：

請“√”出最適合您的情況的答案

	有	沒有	唔知
a. 血壓高	☐ 1	☐ 2	☐ 3
b. 糖尿	☐ 1	☐ 2	☐ 3
c. 心臟毛病	☐ 1	☐ 2	☐ 3
d. 中風	☐ 1	☐ 2	☐ 3
e. 哮喘/肺氣腫/慢性支氣管炎或其他慢性的胸肺病	☐ 1	☐ 2	☐ 3
f. 慢性的關節或風濕病	☐ 1	☐ 2	☐ 3
g. 抑鬱病，神經衰弱或其他精神病	☐ 1	☐ 2	☐ 3
h. 惡性腫瘤	☐ 1	☐ 2	☐ 3
i. 其他重要疾病 **(訪問員請注意: 如果被访者回答 “有”, 請說明是什麼疾病)**	☐ 1 _____ _____ _____ _____	☐ 2	☐ 3

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第二部分：標準十二題簡明健康狀況調查表（第二版）

第二部分是調查您對自己健康的看法。

1. 總括來說，您認為您的健康狀況是：

極好	很好	好	一般	差
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

2. 下列問題是您日常生活中可能進行的活動。以您目前的健康狀況，您在進行這些活動時，有沒有受到限制？如果有的話，程度如何？

	有很大限制	有一點限制	沒有任何限制
a. 中等強度的活動，比如搬桌子，使用吸塵器清潔地面，玩保齡球或打太極拳	☐ 1	☐ 2	☐ 3
b. 上幾層樓梯	☐ 1	☐ 2	☐ 3

3. 在過去四個星期裏，您在工作或其他日常活動中，有多少時間會因為身體健康的原因而遇到下列的問題？

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作或其他活動的種類受到限制	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

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4. 在過去的四個星期裏，您在工作或其他日常活動中，有多少時間由於情緒方面的原因（比如感到沮喪或焦慮）遇到下列的問題?

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作時或從事其他活動時不如往常細心了	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5. 在過去四個星期裏，您身體上的疼痛對您的日常工作（包括上班和家務）有多大影響？

毫無影響	有很少影響	有一些影響	有較大影響	有極大影響
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

6. 下列問題是有關您在過去四個星期裏您覺得怎樣和您其他的情況。針對每一個問題，請選擇一個最接近您的感覺的答案。在過去四個星期裏有多少時間：

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 您感到心平氣和？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您感到精力充足？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您覺得心情不好，悶悶不樂？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

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7. 在過去四個星期裏，有多少時間由於您的身體健康或情緒問題妨礙了您的社交活動(比如探親、訪友等）？

常常有妨礙	大部分時間有妨礙	有時有妨礙	偶爾有妨礙	完全沒有妨礙
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

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第三部分：醫療服務使用率和其他個人統計資料

1. 請問您需唔需要定期看醫生呢？

   1. 要
   2. 唔要
   3. 唔知

2. 請問您在過去一個月內有沒有使用任何 (包括醫生處方或非醫生處方)的藥物

   1. 有用西藥
   2. 有用中藥
   3. 有用中藥及西藥
   4. 有,但不知道藥物的種類
   5. 沒有
   6. 不肯定

3. 請問過去一個月內您有沒有接受過非藥物的治療?

   1. 有, 請說明_____
   2. 沒有
   3. 不肯定

4. 請問您過去一個月內總共看了多少次醫生？

   總共_____次 (99 = 唔知)

   a. 其中幾次是定期西醫復診？_____次 (99 = 唔知)

   b. 除了定期西醫復診之外，還有幾次是主動去看西醫？_____次 (99 = 唔知)

   c. 其中幾次是定期中醫復診？_____次 (99 = 唔知)

   d. 除了定期中醫復診之外，還有幾次是主動去看中醫？_____次 (99 = 唔知)

5. 請問您過去一個月內有沒有使有政府或醫管局醫院急症室?

   1. 有_____次
   2. 沒有
   3. 唔知

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Appendix F

6. 請問您過去一個月內有沒有入過醫院留醫？

   1. 有_____次
   2. 沒有
   3. 唔知

7. 請問您過去一個月內請了多少天病假？

   _____天 (99 = 唔知)

8. 請問您有沒有因為健康問題而提早退休或失業？

   1. 有, 提早退休
   2. 有, 失業
   3. 沒有
   4. 唔知

9. 請問您可唔可以自己照顧自已的起居生活，例如洗澡更衣等？

   1. 可以
   2. 唔可以
   3. 唔知

10. 請問您是否有吸煙的習慣？

   1. 現在有，每天吸
   2. 有, 但不是每天都吸
   3. 以前有, 已戒了
   4. 從沒有
   5. 不知道

11. 請問您是否有飲酒的習慣？

   1. 現在有，每天喝
   2. 有, 但不是每天都喝,平均每星期最少喝一次
   3. 有, 但不是經常性,一個月少過一次
   4. 以前有, 已戒了
   5. 從沒有
   6. 不知道

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Appendix F

12. 您有沒有定時做運動 (不包括工作及家務)?

1. 有, 每星期最少 3 次,每次 30 分鐘或以上
2. 有, 每星期最少 3 次,但每次少於 30 分鐘
3. 有, 但每星期少於 3 次
4. 從沒有
5. 不知道

13. 請問您的教育程度是多少呢？

1. 從來沒有進學
2. 小學
3. 中學(包括預科)
4. 大專或以上
5. 拒絕回答

14. 請問您的婚姻狀況是怎樣呢？

1. 已婚、與配偶同住
2. 單身
3. 已婚、但配偶已去世
4. 已分居或離婚
5. 拒絕回答

15. 請問您是做甚麼職業的呢？

1. 行政及經理級人員
2. 專業人員
3. 老闆／雇主
4. 白領人士
5. 藍領人士
6. 服務工作或銷售人員
7. 學生
8. 家務料理者
9. 退休／沒有工作
10. 其他：_____
11. 拒絕回答

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Appendix F

16. 請問您的家庭每月總收入大約是多少?

1. < $5,000
2. $5,000-10,000
3. $10,000-20,000
4. $20,000-30,000
5. $30,000-40,000
6. > $40,000
7. 拒絕回答

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Appendix F

SUB-HEALTH SURVEY IN HONG KONG

Conducted by Family Medicine Unit,

The University of Hong Kong

Introduction

I represent the Family Medicine Unit of the University of Hong Kong to carry out a research interview on the epidemiology and the clinical significance of Sub-health State (SHS) in Hong Kong Chinese population and use of primary healthcare services. The information is very useful for expand our knowledge on sub-health and planning the future primary health care in Hong Kong. The interview takes only around 10 minutes. The information collected will be kept confidential and used for research purpose only.

May I speak to the adult (age 18 and above) who firstly have the upcoming birthday in your household? Thanks!

To the identified person: Are you willing to be interviewed?

The questionnaire may contain some similar problems, but please answer all of them.

A.	Sex	1. Male 2. Female
B.	What is your age at last birthday?	1. _____ years (unknown/ refusal = 99)

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Appendix F

Section 1 : SUB-HEALTH QUESTIONNAIRE (SHQ)

INSTRUCTIONS

Sub-health State (SHS) is an intermediate state between health and disease.

This survey asks about your health and how well you are able to do your usual activities. Please answer every question. There is no right or wrong answer. If you are unsure about how to answer a question, please give the best answer you can.

1. How TRUE or FALSE is each of the following statements in describing your health status in the past four weeks?

Please '√' the answer that is most appropriate to your situation

	Definitely true	Mostly true	Not sure	Mostly false	Definitely false
a. Your physical health condition was good.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Your mental and emotional condition was good.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. Your energy was good.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. You were able to carry out your usual social activities well.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

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Appendix F

2. How much of the time <u>during the past 4 weeks</u> you have the following problem(s)?

Please '√' the answer that is most appropriate to your situation

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. Any physical symptom such as bodily pain, gastrointestinal discomfort, insomnia or headache, etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Any emotional or psychological symptom such as feeling anxious, frightened, unhappy, depressed, or irritable, etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. Feeling a lack of vitality such as easy fatigue, poor concentration, or slow in response, etc.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. Any difficulty in social interactions with family, friends, colleagues or other people.	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	yes	no	don't
3. Did you consult a doctor for the above health problem (if 'yes', please answer '4'& '5') _____	☐ 1	☐ 2	☐ 3
4. Have a doctor said what disease caused that (if 'yes', please specify) _____	☐ 1	☐ 2	☐ 3
5. Have a doctor said what reason caused that (if 'yes', please specify) _____	☐ 1	☐ 2	☐ 3

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Appendix F

6. Have you ever been diagnosed by a doctor to have any of the following diseases for more than four weeks?

Please '√' the answer that is most appropriate to your situation

	yes	no	don' t know
j. hypertension	☐ 1	☐ 2	☐ 3
k. diabetes mellitus	☐ 1	☐ 2	☐ 3
l. any heart disease	☐ 1	☐ 2	☐ 3
m. stroke	☐ 1	☐ 2	☐ 3
n. asthma, emphysema, chronic bronchitis or other chronic lung diseases	☐ 1	☐ 2	☐ 3
o. arthritis or other chronic joint problems	☐ 1	☐ 2	☐ 3
p. depression, anxiety, euraesthenia or psychosis	☐ 1	☐ 2	☐ 3
q. cancer	☐ 1	☐ 2	☐ 3
r. any other major disease **(Note: If the respondents answer 'yes', please specify)**	☐ 1	☐ 2	☐ 3

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Appendix F

Section 2: SF-12 HEALTH SURVEY (VERSION 2.0)

1. In general, would you say your health is:

Excellent	Very good	Good	Fair	Poor
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

2. The following questions are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
a. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	☐1	☐ 2	☐ 3
b. Climbing **several** flights of stairs	☐ 1	☐ 2	☐ 3

3. During the **past 4 weeks**, how much of the time have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. **Accomplished less** than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Were limited in the **kind** of work or other activities	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

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Appendix F

4. During the **past 4 weeks**, how much of the time 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)?

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. **Accomplished less** than you would like	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. Did work or other activities less **carefully** than usual	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

Not at all	A little bit	Moderately	Quite a bit	Extremely
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

6. These questions are about how you feel and how things have been with you during the past **4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the **past 4 weeks**.

	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a. have you felt calm and peaceful?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. did you have a lot of energy?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. have you felt downhearted and depressed?	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

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Appendix F

7. 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.)?

All of the time	Most of the time	Some of the time	A little of the time	None of the time
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

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Appendix F

Section 3: SERVICE UTILISATION, DEMOGRAPHIC AND MORBIDITY DATA

1. Do you need to see a doctor regularly?

   1. yes
   2. no
   3. don' t know

2. Have you used any medication including those prescribed by the doctor and self-medication in the last one month?

   1. yes, western medicine
   2. yes, Chinese medicine
   3. yes, both western medicine and Chinese medicine
   4. yes, but don' t know the types of drugs
   5. no
   6. not sure

3. In the past month you have not received non-pharmacological treatment?

   1. yes, please specify _____
   2. no
   3. not sure

4. How many times have you consulted a doctor in the last one month?

   Total: _____times (99= don' t know)

   a. _____ times have you consulted a western medicine doctor regularly.

   b. Apart from regular follow up of western medicine doctor, how many times have you consulted a western medicine doctor episodically? _____times (99= don' t know)

   c. _____ times have you consulted a Chinese medicine doctor regularly.

   d. Apart from regular follow up of Chinese medicine practitioner, how many times have you consulted a Chinese medicine doctor episodically? _____times (99= don' t know)

5. Have you used the Govertment or Hospital Authority Accident and Emergency Department in the last one month?

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Appendix F

1. yes, _____ times
2. no,
3. don't' know

6. Have you ever been hospitalized in the last one month?

1. yes, _____ times
2. no,
3. don't' know

7. How many days of sick leave have you taken in the last one month?

_____days (99= don' t know)

8. Have you required to retire early or become unemployed because of health reasons?

1. yes, early retirement
2. yes, unemployed
3. no
4. don't' know

9. Can you take care of yourself in daily living, for example, bathing and changing?

1. yes
2. no
3. don' t know

10. Do you have a smoke habit?

1. yes, smoke every day
2. yes, but not smoke every day
3. previously, but has quit
4. never
5. don't know

11. Do you have a drinking habit?

1. yes, drinke every day
2. yes, but not drink every day, with an average drink at least once per week
3. yes, but not regular, less than once a month
4. previously, but has quit
5. never
6. don't know

12. You have no regular exercise (not including work and home)?

1. yes, at least 3 times per week, each 30 minutes or more

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Appendix F

2. yes, at least 3 times per week, but each time less than 30 minutes
3. yes, but less than 3 times per week
4. never
5. don't know

13. What is your education level (if you are a student, what is the highest education level of either parent)?

1. Nil
2. Primary
3. Secondary
4. Tertiary
5. Refuse to answer

14. What is your marital status?

1. Single
2. Married
3. Divorced
4. Widower
5. Refuse to answer

15. What is your occupation?

1. Managerial/administrative
2. Professional
3. Employer
4. White-collar worker
5. Blue-collar worker
6. Service and sales worker
7. Student
8. Home-maker
9. Retired/unemployed
10. others:_____

16. What is your household monthly income?

1. < $5,000
2. $5,000-10,000
3. $10,000-20,000
4. $20,000-30,000
5. $30,000-40,000
6. > $40,000
7. Refuse to answer

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Appendix G

參加者編號：_____

香港亞健康狀況問卷調查

此項研究由香港大學家庭醫學部舉辦

2-4 周重測評估量表

引言

您好！我姓__, 是代表香港大學家庭醫學部打電話給您。感謝您上次接受我們的電話健康訪問并答應我們電話跟進您的健康情況。 這個電話訪問只需要大約 **5 分鐘**，您提供的所有資料將會絕對保密。

那我們現在開始訪問吧?

問題的答案並沒有【對】或【錯】之分。如果您對某一個問題不能做出肯定的回答，請按照您的理解儘量選擇。

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Appendix G

參加者編號：_____

(A) 亞健康問卷 (SHQ)

說明：

<u>亞健康</u>是指人體處於健康和疾病之間的一種狀態。

A-1. 如果用下列的句子來形容您<u>在過去三個月裏</u>的健康情況，您認為有多正確：

請"√"出最適合您的情況的答案

	非常正確	大致正確	不知道	大致不正確	非常不正確
a. 您的身體健康狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您的情緒和精神狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您有充足的精力	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 您在日常的社交活動裏表現良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

A-2. <u>在過去三個月裏</u>，<u>您有多少時間</u>會有以下的問題？

請"√"出最適合您的情況的答案

	常常如此	大部分時間	間中	很少時間	從來沒有
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 與家人、朋友、同事或其他人的社交活動有任何困難	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

參加者編號：_____

	有	沒有	唔知
A-3. 您有沒有因為以上的健康問題看醫生 (如果 “有”, 請回答 A-4 項？_____	☐ 1	☐ 2	☐ 3
A-4. 醫生有沒有說是什麼病引起的 (如果 “有”, 請說明是什麼疾病) ？ _____ (如果 “沒有”, 請回答 A-5 項）	☐ 1	☐ 2	☐ 3
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A-6. 請問您有沒有經由醫生診斷患有以下任何一種疾病 (多過三個月以上)：

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a. 血壓高	☐ 1	☐ 2	☐ 3
b. 糖尿	☐ 1	☐ 2	☐ 3
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f. 慢性的關節或風濕病	☐ 1	☐ 2	☐ 3
g. 抑鬱病，神經衰弱或其他精神病	☐ 1	☐ 2	☐ 3
h. 癌症	☐ 1	☐ 2	☐ 3
i. 其他重要疾病 (訪問員請注意: 如果被訪者回答 “有”, 請說明是什麼疾病)	☐ 1 _____ _____ _____ _____	☐ 2	☐ 3

香港大學圖書館 HKU Libraries

Appendix G

參加者編號：_____

A-7. 跟你上次接受訪問的時候相比，你認為你的健康情況有多少改變？
（如果被訪者忘記上次的具體時間，請根據上次記錄的訪問時間給予提示：
“跟你___個星期之前相比，你認為你的健康情況有多少改變？）

好了很多	好了一半	好了一點	沒有轉變	差了一點	差了一半	差了很多
❑ +3	❑ +2	❑ +1	❑ 0	❑ -1	❑ -2	❑ -3

A-8. 請問您有沒有興趣參加我們下一部分的研究 (接受每三個月一次的 10 分鐘的電話訪問來跟進您的健康情況, 在一年完成後可獲贈港幣$50 超市現金券一張)？

1. 願意參加：
   您的姓名及日間聯絡電話是:
   姓名:_____
   電話:_____

2. 不願意
3. 未能決定，請在_____再來電

--問卷完成，多謝你的幫助！--

香港大學圖書館 HKU Libraries

Appendix G

參加者編號 _____

被訪者姓名 _____

受訪時間 _____

香港亞健康狀況問卷調查

此項研究由香港大學家庭醫學部舉辦

3/12 跟進評估量表

引言

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香港大學圖書館 HKU Libraries

Appendix G

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	非常正確	大致正確	不知道	大致不正確	非常不正確
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b. 您的情緒和精神狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您有充足的精力	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 您在日常的社交活動裏表現良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

A-2. 在過去三個月裏，您有多少時間會有以下的問題？

請“√”出最適合您的情況的答案

	常常如此	大部分時間	間中	很少時間	從來沒有
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 與家人、朋友、同事或其他人的社交活動有任何困難	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	有	沒有	唔知
A-3. 您有沒有因為以上的健康問題看醫生 (如果 “有”, 請回答 A-4 項？_____	☐ 1	☐ 2	☐ 3
A-4. 醫生有沒有說是什麼病引起的 (如果 “有”, 請說明是什麼疾病) ？_____ (如果 “沒有”, 請回答 A-5 項）	☐ 1	☐ 2	☐ 3
A-5. 醫生有沒有解釋為什麼您有這些問題 (如果 “有”, 請說明是什麼原因) ？_____	☐ 1	☐ 2	☐ 3

香港大學圖書館 HKU Libraries

Appendix G

A-6. 請問您有沒有經由醫生診斷患有以下任何一種疾病 (多過三個月以上)：

請“√”出最適合您的情況的答案

	有	沒有	唔知
a. 血壓高	☐ 1	☐ 2	☐ 3
b. 糖尿	☐ 1	☐ 2	☐ 3
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h. 癌症	☐ 1	☐ 2	☐ 3
i. 其他重要疾病 **(訪問員請注意: 如果被訪者回答 “有”, 請說明是什麼疾病)**	☐ 1 _____ _____ _____ _____	☐ 2	☐ 3

A-7. 跟您三個月前相比，您認為您的健康情況有多少改變？

好了很多	好了一半	好了一點	沒有轉變	差了一點	差了一半	差了很多
❑ +3	❑ +2	❑ +1	❑ 0	❑ -1	❑ -2	❑ -3

香港大學圖書館 HKU Libraries

Appendix G

(B) 標準十二題簡明健康狀況調查表（第二版）

說明：

第二部分是調查您對自己健康的看法。

B-1. 總括來說，您認為您的健康狀況是：

極好	很好	好	一般	差
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-2. 下列問題是您日常生活中可能進行的活動。以您目前的健康狀況，您在進行這些活動時，有沒有受到限制？如果有的話，程度如何？

	有很大限制	有一點限制	沒有任何限制
a. 中等強度的活動，比如搬桌子，使用吸塵器清潔地面，玩保齡球或打太極拳	☐ 1	☐ 2	☐ 3
b. 上幾層樓梯	☐ 1	☐ 2	☐ 3

B-3 在過去四個星期裏，您在工作或其他日常活動中，有多少時間會因為身體健康的原因而遇到下列的問題？

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作或其他活動的種類受到限制	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

B-4. 在過去的四個星期裏，您在工作或其他日常活動中，有多少時間由於情緒方面的原因（比如感到沮喪或焦慮）遇到下列的問題?

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作時或從事其他活動時不如往常細心了	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-5. 在過去四個星期裏，您身體上的疼痛對您的日常工作（包括上班和家務）有多大影響？

毫無影響	有很少影響	有一些影響	有較大影響	有極大影響
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-6.下列問題是有關您在過去四個星期裏您覺得怎樣和您其他的情況。針對每一個問題，請選擇一個最接近您的感覺的答案。在過去四個星期裏有多少時間：

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 您感到心平氣和？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您感到精力充足？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您覺得心情不好，悶悶不樂？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

B-7. 在過去四個星期裏，有多少時間由於您的身體健康或情緒問題妨礙了您的社交活動 (比如探親、訪友等）？

常常有妨礙	大部分時間有妨礙	有時有妨礙	偶爾有妨礙	完全沒有妨礙
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

(C) 醫療服務使用率和其他個人統計資料

說明：

第三部分是有關您使用醫療服務和其他的個人資料。

C-1. 請問您需不需要定期看醫生呢？

1. 要
2. 不要
3. 不知道

C-2. 請問您在過去一個月內有沒有使用任何的藥物 (包括醫生處方或非醫生處方)？

1. 有用西藥
2. 有用中藥
3. 有用中藥及西藥
4. 有,但不知道藥物的種類
5. 沒有
6. 不肯定

香港大學圖書館 HKU Libraries

Appendix G

C-3. 請問過去一個月內，除了服藥之外，您有沒有用過其他的治療?

1. 有, 請說明_____
2. 沒有
3. 不肯定

C-4. 請問您過去一個月內總共看了多少次醫生？

總共_____次 (99 = 不知道)

a. 其中幾次是定期西醫覆診？_____次 (99 = 唔知)

b. 除了定期西醫覆診之外，還看了多少次西醫？_____次 (99 = 唔知)

c. 其中幾次是定期中醫覆診？_____次 (99 = 唔知)

d. 除了定期中醫覆診之外，還看了多少次中醫？_____次 (99 = 唔知)

C-5. 請問您過去一個月內有沒有使有政府或醫管局醫院急症室?

1. 有_____次
2. 沒有
3. 不知道

C-6. 請問您過去一個月內有沒有入過醫院留醫？

1. 有_____次
2. 沒有
3. 不知道

C-7. 請問您過去一個月內請了多少天病假？

_____天 (0=沒請病假；98=不適用，比如無業或自雇；99 =不知道)

C-8. 請問您有沒有因為健康問題而提早退休或失業？

1. 有, 提早退休
2. 有, 失業
3. 沒有
4. 不知道

香港大學圖書館 HKU Libraries

Appendix G

C-9. 請問您可唔可以自己照顧自已的起居生活，例如洗澡更衣等？

1. 可以
2. 不可以
3. 不知道

C-10. 請問您是否有吸煙的習慣？

1. 現在有，每天吸
2. 有, 但不是每天都吸
3. 以前有, 已戒了
4. 從沒有
5. 不知道

C-11．請問您是否有飲酒的習慣？

1. 現在有，每天喝
2. 有, 但不是每天都喝,平均每星期最少喝一次
3. 有, 但不是經常性,一個月少過一次
4. 以前有, 已戒了
5. 從沒有
6. 不知道

C-12. 您有沒有定時做運動 (不包括工作及家務)?

1. 有, 每星期最少 3 次,每次 30 分鐘或以上
2. 有, 每星期最少 3 次,但每次少於 30 分鐘
3. 有, 但每星期少於 3 次
4. 從沒有
5. 不知道

C-13. 請問您的教育程度是多少呢？

1. 從來沒有進學
2. 小學
3. 中學(包括預科)
4. 大專或以上
5. 拒絕回答

香港大學圖書館 HKU Libraries

Appendix G

C-14. 請問您的婚姻狀況是怎樣呢？

1. 已婚、與配偶同住
2. 單身
3. 已婚、但配偶已去世
4. 已分居或離婚
5. 拒絕回答

C-15. 請問您是做甚麼職業的呢？

1. 行政及經理級人員
2. 專業人員
3. 老闆／雇主
4. 白領人士
5. 藍領人士
6. 服務工作或銷售人員
7. 學生
8. 家務料理者
9. 退休／沒有工作
10. 其他：_____
11. 拒絕回答

C-16. 請問您的家庭每月總收入大約是多少?

1. < $5,000
2. $5,000-10,000
3. $10,000-20,000
4. $20,000-30,000
5. $30,000-40,000
6. > $40,000
7. 不知道/很難講/拒絕回答

C-17. 請問您住在哪一區?

1. 中西區	2. 灣仔區	3. 東區
4. 南區	5. 油尖旺	6. 深水埗
7. 九龍城	8. 黃大仙	9. 觀塘
10. 葵青	11. 荃灣	12. 屯門

香港大學圖書館 HKU Libraries

13. 元朗　　14. 北區　　15. 大埔

16. 沙田　　17. 西貢　　18. 離島

19. 不肯定

C-18. 三個月后我們會再通過電話訪問來跟進您的健康情況（大約 10 分鐘）。

1. 願意參加：
2. 不願意
3. 未能決定, 請在_____再來電

感謝您接受我們的訪問！

香港大學圖書館 HKU Libraries

Appendix G

參加者編號 _____

被訪者姓名 _____

受訪時間 _____

香港亞健康狀況問卷調查

此項研究由香港大學家庭醫學部舉辦

6/12 跟進評估量表

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香港大學圖書館 HKU Libraries

Appendix G

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請“√”出最適合您的情況的答案

	非常正確	大致正確	不知道	大致不正確	非常不正確
a. 您的身體健康狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您的情緒和精神狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您有充足的精力	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 您在日常的社交活動裏表現良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

A-2. 在過去三個月裏，您有多少時間會有以下的問題？

請“√”出最適合您的情況的答案

	常常如此	大部分時間	間中	很少時間	從來沒有
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 與家人、朋友、同事或其他人的社交活動有任何困難	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	有	沒有	唔知
A-3. 您有沒有因為以上的健康問題看醫生 (如果 “有”, 請回答 A-4 項？_____	☐ 1	☐ 2	☐ 3
A-4. 醫生有沒有說是什麼病引起的 (如果 “有”, 請說明是什麼疾病) ？_____ (如果 “沒有”, 請回答 A-5 項）	☐ 1	☐ 2	☐ 3
A-5. 醫生有沒有解釋為什麼您有這些問題 (如果 “有”, 請說明是什麼原因) ？_____	☐ 1	☐ 2	☐ 3

香港大學圖書館 HKU Libraries

Appendix G

A-6. 請問您有沒有經由醫生診斷患有以下任何一種疾病 (多過三個月以上)：

請 "√" 出最適合您的情況的答案

	有	沒有	唔知
a. 血壓高	☐ 1	☐ 2	☐ 3
b. 糖尿	☐ 1	☐ 2	☐ 3
c. 心臟毛病	☐ 1	☐ 2	☐ 3
d. 中風	☐ 1	☐ 2	☐ 3
e. 哮喘/肺氣腫/慢性支氣管炎或其他慢性的胸肺病	☐ 1	☐ 2	☐ 3
f. 慢性的關節或風濕病	☐ 1	☐ 2	☐ 3
g. 抑鬱病，神經衰弱或其他精神病	☐ 1	☐ 2	☐ 3
h. 癌症	☐ 1	☐ 2	☐ 3
i. 其他重要疾病 **(訪問員請注意: 如果被訪者回答 "有", 請說明是什麼疾病)**	☐ 1 _____ _____ _____ _____	☐ 2	☐ 3

A-7. 跟您三個月前相比，您認為您的健康情況有多少改變？

好了很多	好了一半	好了一點	沒有轉變	差了一點	差了一半	差了很多
❑ +3	❑ +2	❑ +1	❑ 0	❑ -1	❑ -2	❑ -3

香港大學圖書館 HKU Libraries

Appendix G

(B) 標準十二題簡明健康狀況調查表（第二版）

說明：

第二部分是調查您對自己健康的看法。

B-1. 總括來說，您認為您的健康狀況是：

極好	很好	好	一般	差
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-2. 下列問題是您日常生活中可能進行的活動。以您目前的健康狀況，您在進行這些活動時，有沒有受到限制？如果有的話，程度如何？

	有很大限制	有一點限制	沒有任何限制
a. 中等強度的活動，比如搬桌子，使用吸塵器清潔地面，玩保齡球或打太極拳	☐ 1	☐ 2	☐ 3
b. 上幾層樓梯	☐ 1	☐ 2	☐ 3

B-3 在過去四個星期裏，您在工作或其他日常活動中，有多少時間會因為身體健康的原因而遇到下列的問題？

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作或其他活動的種類受到限制	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

B-4. 在過去的四個星期裏，您在工作或其他日常活動中，有多少時間由於情緒方面的原因（比如感到沮喪或焦慮）遇到下列的問題?

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作時或從事其他活動時不如往常細心了	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-5. 在過去四個星期裏，您身體上的疼痛對您的日常工作（包括上班和家務）有多大影響？

毫無影響	有很少影響	有一些影響	有較大影響	有極大影響
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-6.下列問題是有關您在過去四個星期裏您覺得怎樣和您其他的情況。針對每一個問題，請選擇一個最接近您的感覺的答案。在過去四個星期裏有多少時間：

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 您感到心平氣和？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您感到精力充足？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您覺得心情不好，悶悶不樂？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

B-7. 在過去四個星期裏，有多少時間由於您的身體健康或情緒問題妨礙了您的社交活動 (比如探親、訪友等）？

常常有妨礙	大部分時間有妨礙	有時有妨礙	偶爾有妨礙	完全沒有妨礙
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

(C) 醫療服務使用率和其他個人統計資料

說明：

第三部分是有關您使用醫療服務和其他的個人資料。

C-1. 請問您需不需要定期看醫生呢？

1. 要
2. 不要
3. 不知道

C-2. 請問您在過去一個月內有沒有使用任何的藥物 (包括醫生處方或非醫生處方)？

1. 有用西藥
2. 有用中藥
3. 有用中藥及西藥
4. 有,但不知道藥物的種類
5. 沒有
6. 不肯定

C-3. 請問過去一個月內，除了服藥之外，您有沒有用過其他的治療?

1. 有, 請說明_____
2. 沒有
3. 不肯定

香港大學圖書館 HKU Libraries

Appendix G

C-4. 請問您過去一個月內總共看了多少次醫生？

總共_____次 (99 = 不知道)

a. 其中幾次是定期西醫覆診？_____次 (99 = 唔知)

b. 除了定期西醫覆診之外，還看了多少次西醫？_____次 (99 = 唔知)

c. 其中幾次是定期中醫覆診？_____次 (99 = 唔知)

d. 除了定期中醫覆診之外，還看了多少次中醫？_____次 (99 = 唔知)

C-5. 請問您過去一個月內有沒有使有政府或醫管局醫院急症室?

1. 有_____次
2. 沒有
3. 不知道

C-6. 請問您過去一個月內有沒有入過醫院留醫？

1. 有_____次
2. 沒有
3. 不知道

C-7. 請問您過去一個月內請了多少天病假？

_____天 (0=沒請病假；98=不適用，比如無業或自雇；99 =不知道)

C-8. 請問您有沒有因為健康問題而提早退休或失業？

1. 有, 提早退休
2. 有, 失業
3. 沒有
4. 不知道

C-9. 請問您可唔可以自己照顧自已的起居生活，例如洗澡更衣等？

1. 可以
2. 不可以
3. 不知道

香港大學圖書館 HKU Libraries

Appendix G

C-10. 請問您是否有吸煙的習慣？

1. 現在有，每天吸
2. 有, 但不是每天都吸
3. 以前有, 已戒了
4. 從沒有
5. 不知道

C-11．請問您是否有飲酒的習慣？

1. 現在有，每天喝
2. 有, 但不是每天都喝,平均每星期最少喝一次
3. 有, 但不是經常性,一個月少過一次
4. 以前有, 已戒了
5. 從沒有
6. 不知道

C-12. 您有沒有定時做運動 (不包括工作及家務)?

1. 有, 每星期最少 3 次,每次 30 分鐘或以上
2. 有, 每星期最少 3 次,但每次少於 30 分鐘
3. 有, 但每星期少於 3 次
4. 從沒有
5. 不知道

C-13. 請問您的教育程度是多少呢？

1. 從來沒有進學
2. 小學
3. 中學(包括預科)
4. 大專或以上
5. 拒絕回答

C-14. 請問您的婚姻狀況是怎樣呢？

1. 已婚、與配偶同住
2. 單身
3. 已婚、但配偶已去世
4. 已分居或離婚
5. 拒絕回答

香港大學圖書館 HKU Libraries

Appendix G

C-15. 請問您是做甚麼職業的呢？

1. 行政及經理級人員
2. 專業人員
3. 老闆／雇主
4. 白領人士
5. 藍領人士
6. 服務工作或銷售人員
7. 學生
8. 家務料理者
9. 退休／沒有工作
10. 其他：_____
11. 拒絕回答

C-16. 請問您的家庭每月總收入大約是多少?

1. < $5,000
2. $5,000-10,000
3. $10,000-20,000
4. $20,000-30,000
5. $30,000-40,000
6. > $40,000
7. 不知道/很難講/拒絕回答

C-17. 請問您住在哪一區?

1. 中西區	2. 灣仔區	3. 東區
4. 南區	5. 油尖旺	6. 深水埗
7. 九龍城	8. 黃大仙	9. 觀塘
10. 葵青	11. 荃灣	12. 屯門
13. 元朗	14. 北區	15. 大埔
16. 沙田	17. 西貢	18. 離島
19. 不肯定		

香港大學圖書館 HKU Libraries

Appendix G

C-18. 三個月后我們會再通過電話訪問來跟進您的健康情況（大約 10 分鐘）。

1. 願意參加：
2. 不願意
3. 未能決定, 請在_____再來電

感謝您接受我們的訪問！

香港大學圖書館 HKU Libraries

Appendix G

參加者編號 _____

被訪者姓名 _____

受訪時間 _____

香港亞健康狀況問卷調查

此項研究由香港大學家庭醫學部舉辦

9/12 跟進評估量表

引言

您好！我姓__, 是代表香港大學家庭醫學部打電話給您。感謝您上次接受我們的電話健康訪問并答應我們電話跟進您的健康情況。 這個電話訪問只需要大約 10 分鐘，您提供的所有資料將會絕對保密。

那我們現在開始訪問吧?

問題的答案並沒有【對】或【錯】之分。如果您對某一個問題不能做出肯定的回答，請按照您的理解儘量選擇。

香港大學圖書館 HKU Libraries

Appendix G

(A) 亞健康問卷 (SHQ)

說明：

亞健康是指人體處於健康和疾病之間的一種狀態。

A-1. 如果用下列的句子來形容您在過去三個月裏的健康情況，您認為有多正確：

請“√”出最適合您的情況的答案

	非常正確	大致正確	不知道	大致不正確	非常不正確
a. 您的身體健康狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您的情緒和精神狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您有充足的精力	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 您在日常的社交活動裏表現良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

A-2. 在過去三個月裏，您有多少時間會有以下的問題？

請“√”出最適合您的情況的答案

	常常如此	大部分時間	間中	很少時間	從來沒有
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 與家人、朋友、同事或其他人的社交活動有任何困難	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	有	沒有	唔知
A-3. 您有沒有因為以上的健康問題看醫生 (如果 “有”, 請回答 A-4 項？_____	☐ 1	☐ 2	☐ 3
A-4. 醫生有沒有說是什麼病引起的 (如果 “有”, 請說明是什麼疾病) ？_____ (如果 “沒有”, 請回答 A-5 項）	☐ 1	☐ 2	☐ 3
A-5. 醫生有沒有解釋為什麼您有這些問題 (如果 “有”, 請說明是什麼原因) ？_____	☐ 1	☐ 2	☐ 3

香港大學圖書館 HKU Libraries

Appendix G

A-6. 請問您有沒有經由醫生診斷患有以下任何一種疾病 (多過三個月以上)：

請“√”出最適合您的情況的答案

	有	沒有	唔知
a. 血壓高	☐ 1	☐ 2	☐ 3
b. 糖尿	☐ 1	☐ 2	☐ 3
c. 心臟毛病	☐ 1	☐ 2	☐ 3
d. 中風	☐ 1	☐ 2	☐ 3
e. 哮喘/肺氣腫/慢性支氣管炎或其他慢性的胸肺病	☐ 1	☐ 2	☐ 3
f. 慢性的關節或風濕病	☐ 1	☐ 2	☐ 3
g. 抑鬱病，神經衰弱或其他精神病	☐ 1	☐ 2	☐ 3
h. 癌症	☐ 1	☐ 2	☐ 3
i. 其他重要疾病 **(訪問員請注意: 如果被訪者回答 “有”, 請說明是什麼疾病)**	☐ 1 _____ _____ _____ _____	☐ 2	☐ 3

A-7. 跟您三個月前相比，您認為您的健康情況有多少改變？

好了很多	好了一半	好了一點	沒有轉變	差了一點	差了一半	差了很多
❑ +3	❑ +2	❑ +1	❑ 0	❑ -1	❑ -2	❑ -3

香港大學圖書館 HKU Libraries

Appendix G

(B) 標準十二題簡明健康狀況調查表（第二版）

說明：

第二部分是調查您對自己健康的看法。

B-1. 總括來說，您認為您的健康狀況是：

極好	很好	好	一般	差
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-2. 下列問題是您日常生活中可能進行的活動。以您目前的健康狀況，您在進行這些活動時，有沒有受到限制？如果有的話，程度如何？

	有很大限制	有一點限制	沒有任何限制
a. 中等強度的活動，比如搬桌子，使用吸塵器清潔地面，玩保齡球或打太極拳	☐ 1	☐ 2	☐ 3
b. 上幾層樓梯	☐ 1	☐ 2	☐ 3

B-3 在過去四個星期裏，您在工作或其他日常活動中，有多少時間會因為身體健康的原因而遇到下列的問題？

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作或其他活動的種類受到限制	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

B-4. 在過去的四個星期裏，您在工作或其他日常活動中，有多少時間由於情緒方面的原因（比如感到沮喪或焦慮）遇到下列的問題?

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作時或從事其他活動時不如往常細心了	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-5. 在過去四個星期裏，您身體上的疼痛對您的日常工作（包括上班和家務）有多大影響？

毫無影響	有很少影響	有一些影響	有較大影響	有極大影響
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-6.下列問題是有關您在過去四個星期裏您覺得怎樣和您其他的情況。針對每一個問題，請選擇一個最接近您的感覺的答案。在過去四個星期裏有多少時間：

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 您感到心平氣和？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您感到精力充足？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您覺得心情不好，悶悶不樂？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

B-7. 在過去四個星期裏，有多少時間由於您的身體健康或情緒問題妨礙了您的社交活動 (比如探親、訪友等）？

常常有妨礙	大部分時間有妨礙	有時有妨礙	偶爾有妨礙	完全沒有妨礙
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

(C) 醫療服務使用率和其他個人統計資料

說明：

第三部分是有關您使用醫療服務和其他的個人資料。

C-1. 請問您需不需要定期看醫生呢？

1. 要
2. 不要
3. 不知道

C-2. 請問您在過去一個月內有沒有使用任何的藥物 (包括醫生處方或非醫生處方)？

1. 有用西藥
2. 有用中藥
3. 有用中藥及西藥
4. 有,但不知道藥物的種類
5. 沒有
6. 不肯定

香港大學圖書館 HKU Libraries

Appendix G

C-3. 請問過去一個月內，除了服藥之外，您有沒有用過其他的治療?

1. 有, 請說明_____
2. 沒有
3. 不肯定

C-4. 請問您過去一個月內總共看了多少次醫生？

總共_____次 (99 = 不知道)

a. 其中幾次是定期西醫覆診？_____次 (99 = 唔知)

b. 除了定期西醫覆診之外，還看了多少次西醫？_____次 (99 = 唔知)

c. 其中幾次是定期中醫覆診？_____次 (99 = 唔知)

d. 除了定期中醫覆診之外，還看了多少次中醫？_____次 (99 = 唔知)

C-5. 請問您過去一個月內有沒有使有政府或醫管局醫院急症室?

1. 有_____次
2. 沒有
3. 不知道

C-6. 請問您過去一個月內有沒有入過醫院留醫？

1. 有_____次
2. 沒有
3. 不知道

C-7. 請問您過去一個月內請了多少天病假？

_____天 (0=沒請病假；98=不適用，比如無業或自雇；99 =不知道)

C-8. 請問您有沒有因為健康問題而提早退休或失業？

1. 有, 提早退休
2. 有, 失業
3. 沒有
4. 不知道

香港大學圖書館 HKU Libraries

Appendix G

C-9. 請問您可唔可以自己照顧自已的起居生活，例如洗澡更衣等？

1. 可以
2. 不可以
3. 不知道

C-10. 請問您是否有吸煙的習慣？

1. 現在有，每天吸
2. 有, 但不是每天都吸
3. 以前有, 已戒了
4. 從沒有
5. 不知道

C-11．請問您是否有飲酒的習慣？

1. 現在有，每天喝
2. 有, 但不是每天都喝,平均每星期最少喝一次
3. 有, 但不是經常性,一個月少過一次
4. 以前有, 已戒了
5. 從沒有
6. 不知道

C-12. 您有沒有定時做運動 (不包括工作及家務)?

1. 有, 每星期最少 3 次,每次 30 分鐘或以上
2. 有, 每星期最少 3 次,但每次少於 30 分鐘
3. 有, 但每星期少於 3 次
4. 從沒有
5. 不知道

C-13. 請問您的教育程度是多少呢？

1. 從來沒有進學
2. 小學
3. 中學(包括預科)
4. 大專或以上
5. 拒絕回答

香港大學圖書館 HKU Libraries

Appendix G

C-14. 請問您的婚姻狀況是怎樣呢？

1. 已婚、與配偶同住
2. 單身
3. 已婚、但配偶已去世
4. 已分居或離婚
5. 拒絕回答

C-15. 請問您是做甚麼職業的呢？

1. 行政及經理級人員
2. 專業人員
3. 老闆／雇主
4. 白領人士
5. 藍領人士
6. 服務工作或銷售人員
7. 學生
8. 家務料理者
9. 退休／沒有工作
10. 其他：_____
11. 拒絕回答

C-16. 請問您的家庭每月總收入大約是多少?

1. < $5,000
2. $5,000-10,000
3. $10,000-20,000
4. $20,000-30,000
5. $30,000-40,000
6. > $40,000
7. 不知道/很難講/拒絕回答

C-17. 請問您住在哪一區?

1. 中西區	2. 灣仔區	3. 東區
4. 南區	5. 油尖旺	6. 深水埗
7. 九龍城	8. 黃大仙	9. 觀塘
10. 葵青	11. 荃灣	12. 屯門

香港大學圖書館 HKU Libraries

13. 元朗　　14. 北區　　15. 大埔

16. 沙田　　17. 西貢　　18. 離島

19. 不肯定

C-18. 三個月后我們會再通過電話訪問來跟進您的健康情況（大約 10 分鐘）。

1. 願意參加：
2. 不願意
3. 未能決定, 請在_____再來電

感謝您接受我們的訪問！

香港大學圖書館 HKU Libraries

Appendix G

參加者編號 _____

被訪者姓名 _____

受訪時間 _____

香港亞健康狀況問卷調查

此項研究由香港大學家庭醫學部舉辦

12/12 跟進評估量表

引言

您好！我姓__, 是代表香港大學家庭醫學部打電話給您。感謝您上次接受我們的電話健康訪問并答應我們電話跟進您的健康情況。 這個電話訪問只需要大約 10 分鐘，您提供的所有資料將會絕對保密。

那我們現在開始訪問吧?

問題的答案並沒有【對】或【錯】之分。如果您對某一個問題不能做出肯定的回答，請按照您的理解儘量選擇。

香港大學圖書館 HKU Libraries

Appendix G

(A) 亞健康問卷 (SHQ)

說明：

亞健康是指人體處於健康和疾病之間的一種狀態。

A-1. 如果用下列的句子來形容您在過去三個月裏的健康情況，您認為有多正確：

請“√”出最適合您的情況的答案

	非常正確	大致正確	不知道	大致不正確	非常不正確
a. 您的身體健康狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您的情緒和精神狀態良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您有充足的精力	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 您在日常的社交活動裏表現良好	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

A-2. 在過去三個月裏，您有多少時間會有以下的問題？

請“√”出最適合您的情況的答案

	常常如此	大部分時間	間中	很少時間	從來沒有
a. 任何身體不適（例如疼痛、腸胃不適、失眠、頭痛等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 任何情緒或精神問題（例如感覺焦慮、恐懼、不開心、 沮喪或煩躁等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 感覺精力不足（例如容易疲勞、注意力不集中、反應遲鈍等）	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
d. 與家人、朋友、同事或其他人的社交活動有任何困難	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

	有	沒有	唔知
A-3. 您有沒有因為以上的健康問題看醫生 (如果 “有”, 請回答 A-4 項？_____	☐ 1	☐ 2	☐ 3
A-4. 醫生有沒有說是什麼病引起的 (如果 “有”, 請說明是什麼疾病) ？_____ (如果 “沒有”, 請回答 A-5 項）	☐ 1	☐ 2	☐ 3
A-5. 醫生有沒有解釋為什麼您有這些問題 (如果 “有”, 請說明是什麼原因) ？_____	☐ 1	☐ 2	☐ 3

香港大學圖書館 HKU Libraries

Appendix G

A-6. 請問您有沒有經由醫生診斷患有以下任何一種疾病 (多過三個月以上)：

請“√”出最適合您的情況的答案

	有	沒有	唔知
a. 血壓高	☐ 1	☐ 2	☐ 3
b. 糖尿	☐ 1	☐ 2	☐ 3
c. 心臟毛病	☐ 1	☐ 2	☐ 3
d. 中風	☐ 1	☐ 2	☐ 3
e. 哮喘/肺氣腫/慢性支氣管炎或其他慢性的胸肺病	☐ 1	☐ 2	☐ 3
f. 慢性的關節或風濕病	☐ 1	☐ 2	☐ 3
g. 抑鬱病，神經衰弱或其他精神病	☐ 1	☐ 2	☐ 3
h. 癌症	☐ 1	☐ 2	☐ 3
i. 其他重要疾病 **(訪問員請注意: 如果被訪者回答 “有”, 請說明是什麼疾病)**	☐ 1 _____ _____ _____ _____	☐ 2	☐ 3

A-7. 跟您三個月前相比，您認為您的健康情況有多少改變？

好了很多	好了一半	好了一點	沒有轉變	差了一點	差了一半	差了很多
❑ +3	❑ +2	❑ +1	❑ 0	❑ -1	❑ -2	❑ -3

香港大學圖書館 HKU Libraries

Appendix G

(B) 標準十二題簡明健康狀況調查表（第二版）

說明：

第二部分是調查您對自己健康的看法。

B-1. 總括來說，您認為您的健康狀況是：

極好	很好	好	一般	差
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-2. 下列問題是您日常生活中可能進行的活動。以您目前的健康狀況，您在進行這些活動時，有沒有受到限制？如果有的話，程度如何？

	有很大限制	有一點限制	沒有任何限制
a. 中等強度的活動，比如搬桌子，使用吸塵器清潔地面，玩保齡球或打太極拳	☐ 1	☐ 2	☐ 3
b. 上幾層樓梯	☐ 1	☐ 2	☐ 3

B-3 在過去四個星期裏，您在工作或其他日常活動中，有多少時間會因為身體健康的原因而遇到下列的問題？

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作或其他活動的種類受到限制	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

Appendix G

B-4. 在過去的四個星期裏，您在工作或其他日常活動中，有多少時間由於情緒方面的原因（比如感到沮喪或焦慮）遇到下列的問題?

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 實際做完的比想做的要少	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 工作時或從事其他活動時不如往常細心了	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-5. 在過去四個星期裏，您身體上的疼痛對您的日常工作（包括上班和家務）有多大影響？

毫無影響	有很少影響	有一些影響	有較大影響	有極大影響
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

B-6.下列問題是有關您在過去四個星期裏您覺得怎樣和您其他的情況。針對每一個問題，請選擇一個最接近您的感覺的答案。在過去四個星期裏有多少時間：

	常常如此	大部分時間	有時	偶爾	從來沒有
a. 您感到心平氣和？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
b. 您感到精力充足？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
c. 您覺得心情不好，悶悶不樂？	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

香港大學圖書館 HKU Libraries

B-7. 在過去四個星期裏，有多少時間由於您的身體健康或情緒問題妨礙了您的社交活動 (比如探親、訪友等）？

常常有妨礙	大部分時間有妨礙	有時有妨礙	偶爾有妨礙	完全沒有妨礙
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

(C) 醫療服務使用率和其他個人統計資料

說明：

第三部分是有關您使用醫療服務和其他的個人資料。

C-1. 請問您需不需要定期看醫生呢？

1. 要
2. 不要
3. 不知道

C-2. 請問您在過去一個月內有沒有使用任何的藥物 (包括醫生處方或非醫生處方)？

1. 有用西藥
2. 有用中藥
3. 有用中藥及西藥
4. 有,但不知道藥物的種類
5. 沒有
6. 不肯定

香港大學圖書館 HKU Libraries

Appendix G

C-3. 請問過去一個月內，除了服藥之外，您有沒有用過其他的治療?

1. 有, 請說明_____
2. 沒有
3. 不肯定

C-4. 請問您過去一個月內總共看了多少次醫生？

總共_____次 (99 = 不知道)

a. 其中幾次是定期西醫覆診？_____次 (99 = 唔知)

b. 除了定期西醫覆診之外，還看了多少次西醫？_____次 (99 = 唔知)

c. 其中幾次是定期中醫覆診？_____次 (99 = 唔知)

d. 除了定期中醫覆診之外，還看了多少次中醫？_____次 (99 = 唔知)

C-5. 請問您過去一個月內有沒有使有政府或醫管局醫院急症室?

1. 有_____次
2. 沒有
3. 不知道

C-6. 請問您過去一個月內有沒有入過醫院留醫？

1. 有_____次
2. 沒有
3. 不知道

C-7. 請問您過去一個月內請了多少天病假？

_____天 (0=沒請病假；98=不適用，比如無業或自雇；99 =不知道)

C-8. 請問您有沒有因為健康問題而提早退休或失業？

1. 有, 提早退休
2. 有, 失業
3. 沒有
4. 不知道

香港大學圖書館 HKU Libraries

Appendix G

C-9. 請問您可唔可以自己照顧自已的起居生活，例如洗澡更衣等？

1. 可以
2. 不可以
3. 不知道

C-10. 請問您是否有吸煙的習慣？

1. 現在有，每天吸
2. 有, 但不是每天都吸
3. 以前有, 已戒了
4. 從沒有
5. 不知道

C-11．請問您是否有飲酒的習慣？

1. 現在有，每天喝
2. 有, 但不是每天都喝,平均每星期最少喝一次
3. 有, 但不是經常性,一個月少過一次
4. 以前有, 已戒了
5. 從沒有
6. 不知道

C-12. 您有沒有定時做運動 (不包括工作及家務)?

1. 有, 每星期最少 3 次,每次 30 分鐘或以上
2. 有, 每星期最少 3 次,但每次少於 30 分鐘
3. 有, 但每星期少於 3 次
4. 從沒有
5. 不知道

C-13. 請問您的教育程度是多少呢？

1. 從來沒有進學
2. 小學
3. 中學(包括預科)
4. 大專或以上
5. 拒絕回答

香港大學圖書館 HKU Libraries

Appendix G

C-14. 請問您的婚姻狀況是怎樣呢？

1. 已婚、與配偶同住
2. 單身
3. 已婚、但配偶已去世
4. 已分居或離婚
5. 拒絕回答

C-15. 請問您是做甚麼職業的呢？

1. 行政及經理級人員
2. 專業人員
3. 老闆／雇主
4. 白領人士
5. 藍領人士
6. 服務工作或銷售人員
7. 學生
8. 家務料理者
9. 退休／沒有工作
10. 其他：_____
11. 拒絕回答

C-16. 請問您的家庭每月總收入大約是多少?

1. < $5,000
2. $5,000-10,000
3. $10,000-20,000
4. $20,000-30,000
5. $30,000-40,000
6. > $40,000
7. 不知道/很難講/拒絕回答

C-17. 請問您住在哪一區?

1. 中西區	2. 灣仔區	3. 東區
4. 南區	5. 油尖旺	6. 深水埗
7. 九龍城	8. 黃大仙	9. 觀塘
10. 葵青	11. 荃灣	12. 屯門
13. 元朗	14. 北區	15. 大埔

香港大學圖書館 HKU Libraries

16. 沙田　　17. 西貢　　18. 離島

19. 不肯定

C-18. 一個月左右我們會再通過郵局寄發 Coupon 給您，請記得提供詳細地址和收件人姓名。

1. 姓名：

2. 地址：

感謝您接受我們的訪問！

香港大學圖書館 HKU Libraries