STRUCTURAL RELATIONSHIP OF GOAL CONTENT, BEHAVIOURAL REGULATION, AND COPING SELF-EFFICACY ON AMOUNT OF PHYSICAL ACTIVITY AMONG UNDERGRADUATE STUDENTS IN HEALTH CAMPUS, UNIVERSITI SAINS MALAYSIA

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by

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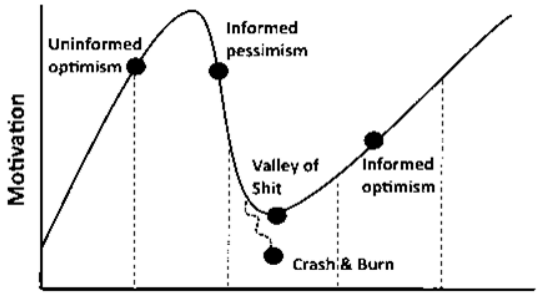
Last but not the least, to my classmates and all friends, who had provided companion, friendship and support in life as a student here, I am extremely grateful for having all of you. Hope that our friendship will continue long after this journey has ended.



As illustrated in the Roller Coaster Curve (in adjacent figure), the motivation along this journey is not constant. Without all of you, the journey may have ended at the "crash & burn". Yet, in the surrounding which nourishes psychological need, difficult journey could be an intrinsically rewarding one.

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LIST OF SYMBOLS AND ABBREVIATIONS

BREQ	Behavioural Regulation in Exercise Questionnaire
BREQ-2	Behavioural Regulation in Exercise Questionnaire-2
BREQ-2R	Behavioural Regulation in Exercise Questionnaire-2 Revised
BREQ-3	Behavioural Regulation in Exercise Questionnaire-3
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
CR	Composite Reliability
CSE	Coping Self-Efficacy Scale
df	Degree of Freedom
EMI-2	Exercise Motivation Inventory-2
EFA	Exploratory Factor Analysis
IFI	Bollen's Incremental Fit Index
JEPeM	Jawatankuasa Etika Penyelidikan Manusia
GCEQ	Goal Content for Exercise Questionnaire
MAR	Missing at random
MCAR	Missing completely at random
MI	Modification Indices
MLR	Maximum likelihood estimation with robust standard errors
n	Sample size / Total participants
PCFI	Parsimonious Comparative Fit Index
PNSE	Psychological Needs in Exercise Scale

r	Correlation Coefficient
RMSEA	Root Mean Square Error of Approximation
SRMR	Standard Root Mean Square Residual
SD	Standard deviation
SDT	Self-Determination Theory
SEM	Structural Equation Modelling
SRMR	Standardised Root Mean Square Residual
TLI	Tucker-Lewis Index
USM	Universiti Sains Malaysia

HUBUNGAN STRUKTURAL ANTARA *GOAL CONTENT, BEHAVIOURAL REGULATION*, DAN *COPING SELF-EFFICACY* DENGAN JUMLAH PENGLIBATAN AKTIVITI FIZIKAL DALAM KALANGAN PELAJAR SARJANA MUDA DI KAMPUS KESIHATAN, UNIVERSITI SAINS MALAYSIA

ABSTRAK

Pengenalan: Penglibatan dalam aktiviti fizikal boleh dipengaruhi factor psikologi, sosial, persekitaran dan biologi. Justeru, pemahaman saintifik mengenai motivasi dan manifestasi tingkah laku adalah penting dalam konteks penglibatan dalam aktiviti fizikal. Namun, instrumen yang disahkan untuk pengukuranfaktor-faktor psikologi, iaitu *goal content, behavioural regulation*, dan *coping self-efficacy* dalam konteks Malaysia masih kekurangan. Hubungan faktor-faktor tersebut dengan jumlah penglibatan aktiviti fizikal juga masih tidak jelas.

Objektif: Kajian ini bertujuan untuk mengesahkan soal selidik versi Melayu yang menilai *goal content*, *behavioural regulation*, dan *coping self-efficacy*. Selain itu, hubungan faktor-faktor tersebut dengan jumlah penglibatan aktiviti fizikal di kalangan pelajar sarjana muda di Kampus Kesihatan, USM juga dikaji.

Kaedah: Kaedah tinjauan soal-selidik menggunakan rekabentuk keratan rentas dilakukan ke atas pelajar sarjana muda di Kampus Kesihatan, USM. Sampel dipilih dengan menggunakan kaedah persampelan bukan kebarangkalian, persampelan *convenience*. *Goal content*, *behavioural regulation*, dan *coping self-efficacy* dinilai dengan menggunakan soal selidik *Goal Content for Exercise Questionnaire* (GCEQ), *Behavioural Regulation in Exercise Questionnaire-3*, and *Coping Self-Efficacy Scale* (CSE) versi Melayu. Statistik deskriptif, pengesahan faktor dan model persamaan struktur digunakan dalam analisa statistik.

Keputusan: Seramai 674 pelajar telah mengambil bahagian dalam kajian ini. Dalam penilaian model pengukuran, GCEQ versi Melayu yang mengekalkan 20 *item* adalah berpadanan dengan data sampel: CFI = 0.929; SRMR = 0.052; RMSEA = 0.061 (90% CI: 0.056, 0.067), *probability* RMSEA = 0.001. BREQ-3 versi Melayu pula menunjukkan kepadanan yang baik setelah mengeluarkan subskala *Identified Regulation*: CFI = 0.949; TLI = 0.938; SRMR = 0.052; RMSEA = 0.049 (90% CI: 0.043, 0.055), *probability* RMSEA = 0.614. Manakala untuk CSE versi Melau yang mengandungi 16 *item* menunjukkan kepadanan yang amat baik: CFI = 0.955; TLI = 0.947; SRMR = 0.037; RMSEA = 0.046 (90% CI: 0.039, 0.054), *probability* RMSEA = 0.779. Kebolehpercayaan komposit bagi GCEQ, BREQ-3, and CSE versi Melayu berada dalam lingkungan 0.777 - 0.851, 0.746 - 0.841, dan 0.804 - 0.883 masing-masing. Selain itu, model SEM menunjukkan kepadanan dengan data sampel kajian yang bagus: CFI = 0.980; TLI = 0.947; SRMR = 0.052; RMSEA = 0.055 (90% CI: 0.041, 0.069), *probability* RMSEA = 0.275 dan 23 hipotesis disokong. Terdapat beberapa hubungan tidak langsung dijumpai yag melibatkan laluan daripada *coping self-efficacy* ke jumlah penglibatan melalui komponen-komponen *goal content* dan *behavioural regulation.*

Kesimpulan: Model struktur hipotesis yang diuji dalam kajian ini dapat memberikan bukti hubungan langsung dan tidak langsung antara *goal content*, *behavioural regulation*, *coping self-efficacy*, dan jumlah penglibatan aktiviti fizikal. Penemuan kajian ini boleh memberikan maklumat berguna yang boleh membantu individu, pembuat polisi kesihatan, pengajar kesihatan, dalam meningkatkan prestasi dan penglibatan dalam aktiviti fizikal dalam kalangan pelajar universiti.

STRUCTURAL RELATIONSHIP OF GOAL CONTENT, BEHAVIOURAL REGULATION, AND COPING SELF-EFFICACY ON AMOUNT OF PHYSICAL ACTIVITY AMONG UNDERGRADUATE STUDENTS IN HEALTH CAMPUS, UNIVERSITI SAINS MALAYSIA

ABSTRACT

Introduction: Physical activity engagement can be influenced by complex interaction between psychological, social, environmental and biological influences. Therefore, there is a need for scientific understanding of motivation and behaviour manifestation, in the context of doing of physical activities. Yet, there is lack of evidence on validated instrument for the measurement of the psychological factors, namely goal content, behavioural regulation, and coping self-efficacy in the Malaysian context. The effect of their relationships with the amount of physical activity remains unclear.

Objective: This study aimed to determine measurement validity of the Malay-translated version questionnaires assessing goal content, behavioural regulation, and coping self-efficacy. Subsequently, examine their structural relationships with amount of physical activity among undergraduate students in Health Campus, Universiti Sains Malaysia (USM).

Method: A cross-sectional study using questionnaire approach was conducted among undergraduate students in Health Campus, USM. Participant was selected using convenience sampling, a non-probability sampling method. Goal content, behavioural regulation, and coping self-efficacy were measured using Malay-translated version of Goal Content for Exercise Questionnaire (GCEQ), Behavioural Regulation in Exercise Questionnaire-3, and Coping Self-Efficacy Scale (CSE). Descriptive statistics, confirmatory factor analysis (CFA), and structural equation modelling (SEM) were conducted for statistical analyses.

Results: A total of 674 students participated in this study. In measurement model assessment, the Malay version of GCEQ indicated that the 20-item model was fit with all items remained: CFI = 0.929; SRMR = 0.052; RMSEA = 0.061 (90% CI: 0.056, 0.067), probability RMSEA = 0.001. The Malay version of BREQ-3 displayed good fit after removing Identified Regulation subscale: CFI = 0.949; TLI = 0.938; SRMR = 0.052; RMSEA = 0.049 (90% CI: 0.043, 0.055), probability RMSEA = 0.614. Meanwhile, 16-item Malay version of CSE showed an excellent model fit: CFI = 0.955; TLI = 0.947; SRMR = 0.037; RMSEA = 0.046 (90% CI: 0.039, 0.054), probability RMSEA = 0.779. The composite reliability for Malay version of GCEQ, BREQ-3, and CSE ranged from 0.777 - 0.851, 0.746 - 0.841, and 0.804 - 0.883 respectively. In addition, the SEM model showed an excellent fit: CFI = 0.980; TLI = 0.947; SRMR = 0.052; RMSEA = 0.055 (90% CI: 0.041, 0.069), probability RMSEA = 0.275 with 23 hypotheses supported. Several indirect relationships were observed involving pathways from coping self-efficacy to physical activity through components of goal content and behavioural regulation.

Conclusion: The hypothesised structural model tested in current study provided evidences of the direct and indirect relationships among goal content, behavioural regulation, coping self-efficacy, and amount of physical activity. The findings provide valuable information that could help the individuals, health policy makers, and health educators in enhancing the performance and participation in physical activity among university students.

CHAPTER 1

INTRODUCTION

1.1 Overview

The World Health Organization (WHO) describes physical activity as "any bodily movement produced by skeletal muscles that requires energy expenditure". This includes the activities assumed while working, playing, doing household tasks and engaging in recreational activities. On the other hand, exercise is a subset of physical activity that is "planned, structured, repetitive which is performed to improve or maintain physical fitness (WHO, 2018c).

As regular physical activity is vital as an element of healthy lifestyle, insufficient physical activity is now viewed as one of the most important risk factors for mortality of various causes worldwide. WHO recognises the role of physical activity and exercise participation in facilitating reductions in burden of non-communicable diseases such as obesity, diabetes mellitus, ischaemic heart disease, hypertension, some forms of cancer, including colon and breast cancer, osteoporosis and depression (WHO, 2018a; WHO, 2018b). Insufficient physical activity is the contributing factor to the disease burden. Regular and adequate physical activity in adults is fundamental for energy expenditure, which in turn is essential for energy balance and weight control. Therefore, WHO recommends that an adult aged 18 to 64 years should perform at least 150 minutes per week of moderate-intensity physical activity, or 75 minutes per week of vigorous-intensity physical activity, or an equivalent combination of moderate- and vigorous-intensity physical activity (WHO, 2018c).

1.2 Background of the Study

According to Biddle and Mutrie (2008), physical activity engagement can be influenced by the complex interaction between psychological, social, environmental and biological influences.

Undoubtedly, human motivation matters in many areas in life, regardless the role an individual is playing, for instance parents, students, workers or employers. People are concerned with motivation, in other words, how to "move" individuals: others or they themselves to perform an act or behaviour. The possible factors which are capable in doing so might be originating from external sources such as rewards, punishment or for opinions and appraisal others might have of them. Self-Determination Theory (SDT) is a macro theory of human motivation and has been a mainstay within the motivational literature for more than 40 years and remains actively researched to these days. On the other hand, Bandura's Self-Efficacy Theory describes how the beliefs determine feeling, thinking, motivation and behaviour in human. There are a number of questionnaires developed based on the theories, for sport psychology research to examine various aspects pertaining to physical activity. Examples of the questionnaire commonly used are discussed in Chapter 3. In this study, Goal Content for Exercise Questionnaire (GCEQ), Behavioural Regulation in Exercise Questionnaire (BREQ-3) and Coping Self-Efficacy Scale (CSE) were used.

1.3 Problem Statement

Goal content, behavioural regulation, and coping self-efficacy are among the important psychological aspects that motivate, and influence people's time spend on exercise and physical activity. The effect of their relationships with the amount of physical activity remains unclear. It is known from previous works that the contents of person's valued goals and the regulatory processes relate to physical activity, however, not much had been done on coping self-efficacy.

On top of that, as sport psychology is relatively new in Malaysia, there is no validated Malay version of questionnaires that can be used to measure these aspects. Therefore, the validity and reliability of the scales among Malaysian population remain unknown. As Malay language is the

main language spoken in Malaysian community, it is of utmost importance to validate the Malay-translated questionnaire to ensure the validity and reliability of the scales for future research and works in Malaysian setting.

Thus, establishing valid and reliable Malay version questionnaires that measure people's goal, behavioural regulation, and coping self-efficacy on exercise are crucial for future researchers, health planner, educators and sport psychologists.

In the current study, researcher targeted to explore the psychological factors and amount of physical activity among the undergraduates in Health Campus, USM as the first step before further exploration in general population. Besides, the physical activity among the population in the age group was among the lowest (Institute of Public Health, 2015).

1.4 Rationale and Significance of the Study

There is a need for scientific understanding of motivation and behaviour manifestation, in the context of doing of physical activities. By determining the path relationships of goal, behavioural regulation, coping self-efficacy, and amount of physical activity, it is expected to uncover the relationship between the factors which could influence participation in physical activities among undergraduate students. The findings should prove beneficial on an individual level, but also help the community and possibly enhance their performance and participation physical activity.

1.5 Scope of the Study

The scope of this study focused on goal content, behavioural regulation, coping self-efficacy, and amount of physical activity among undergraduate students, currently studying in Health Campus, Universiti Sains Malaysia (USM).

1.6 Research Questions

1. Are Malay-translated versions of GCEQ, BREQ-3 and CSE valid and reliable questionnaires for assessing goal content, behavioural regulation, and coping self-efficacy among undergraduate students in Health Campus, USM using confirmatory factor analysis?
2. Is there any significant path relationship among goal content, behavioural regulation, coping self-efficacy, and amount of physical activity among undergraduate students in Health Campus, USM?

1.7 Research Objectives

1.7.1 General Objectives

To validate the Malay-translated version questionnaires assessing goal content, behavioural regulation, and coping self-efficacy and determine their relationships with amount of physical activity among undergraduate students in Health Campus, USM.

1.7.2 Specific Objectives

1. To assess the validity and reliability of the Malay-translated version of GCEQ, BREQ-3 and CSE for assessing the goal content, behavioural regulation, and coping self-efficacy among undergraduate students in Health Campus, USM by using Confirmatory Factor Analysis.
2. To determine the path relationships of goal content, behavioural regulation, coping self-efficacy, and amount of physical activity among undergraduate students in Health Campus, USM.

1.8 Research Hypotheses

The research hypotheses of the study are stated according to each of the specific objectives of the study, as follows:

Objective 1: The Malay-translated version of GCEQ, BREQ-3 and CSE are valid and reliable questionnaires for assessing the goal content, behavioural regulation, and coping self-efficacy among undergraduate students in Health Campus, USM using confirmatory factor analysis.

Objective 2: There are significant path relationships between goal content, behavioural regulation, coping self-efficacy, and amount of physical activity among undergraduate students in Health Campus, USM.

1.9 Definitions of Terminology

For the purposes of the current study, the following definitions were applied.

Table 1.1 Operational Definitions

Terms	Definitions
Goal Content	
Intrinsic goal/ aspiration	Goals which are most directly linked to the pursuit of elements **inherently valued**, such as one's growth, close affiliations and relationships, and contributing to community, which are expected to closely associate with basic need satisfaction (Ng *et al.*, 2012; Ryan and Deci, 2017)
Extrinsic goal/ aspiration	Goals which focus on **instrumental outcomes**, such as wealth, fame, power, or image/ outward attractiveness, which are expected to be only indirectly associated with basic need satisfaction or even need-frustrating (Ng *et al.*, 2012; Ryan and Deci, 2017)
Motives	Reasons (Sebire *et al.*, 2008)
Behavioural Regulation	
Self	Core self-regulatory system as in SDT (Gagné and Deci, 2014)
Autonomous motivation	The composite of autonomous facets of self-regulation. Comprises of **intrinsic, integrated** and **identified** regulation, usually yield

	more positive behavioural and affective outcomes, as compared to controlled motivation (Ng *et al.*, 2012; Gagné and Deci, 2014)
Controlled motivation	The composite of controlled facets of self-regulation. Comprises of **external** and **introjected regulation** (Ng *et al.*, 2012; Gagné and Deci, 2014)
Amotivation	The state of lacking intentionality and motivation to act. The person is passive, ineffective or purposeless with regards to any given potential actions (Ng *et al.*, 2012; Ryan and Deci, 2017)
External regulation	Motivation to comply with **external pressure or rewards**. The doing of an action is not interesting and enjoyable, but aims to obtain a separate consequence, such as to gain rewards, social approval, avoid punishments or to attain a valued outcome. It was previously known as extrinsic motivation (Ng *et al.*, 2012; Gagné and Deci, 2014; Ryan and Deci, 2017)
Introjected regulation	Motivation reflecting **internal pressures** for ego reasons, contingent self-esteem, fear of disapproval, to feel worthy, to avoid guilt or shame. It involves **partial internalization**, i.e. learning and taking in values, behaviours, norms and beliefs and making them one's own. It is internal to the individual, however, despite taking in the external controls, it is not fully accepted and is still external to his own integrated sense of self and has external perceived locus of causality like in external regulation (Ng *et al.*, 2012; Gagné and Deci, 2014; Ryan and Deci, 2017)
Identified regulation	Motivation reflecting the **personal value of the behaviour's outcomes** A **fuller internalization** into one's self that involves doing an action that is out of personal values or self-selected goals. It has an internal perceived locus of causality like in intrinsic motivation, because it has been more fully integrated into one's self (Ng *et al.*, 2012; Gagné and Deci, 2014; Ryan and Deci, 2017)
Integrated regulation	Motivation to engage in behaviours which are in congruence with other **central personal goals and values** (Ng *et al.*, 2012)
Intrinsic regulation	Motivation due to the **inherent enjoyment** derived from the behaviour itself. The action is performed out of interest and the primary "reward" is the spontaneous feelings of "effectance and enjoyment" and emanating from one's self. It is, by definition, autonomous (Ng *et al.*, 2012; Ryan and Deci, 2017)
Coping Self-Efficacy	
Stress	Person-environment relationship that is appraised as personally taxing or exceeding a person's resources for coping (Chesney *et al.*, 2006)

Coping	Behavioural or cognitive efforts to manage (minimise, reduce, master or tolerate) situations that are appraised as stressful (Folkman *et al.*, 1986; Chesney *et al.*, 2006)
Self-efficacy	Belief about one's ability to perform a specific behaviour, which may influence over events that affect his or her life (Bandura, 1994)
Coping self-efficacy	Belief in ability to cope with stress effectively (Chesney *et al.*, 2006)

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Self-Determination Theory (SDT) has been developed gradually to become one of the major theories of human motivation over the past 40 years (Gagné and Deci, 2014). The theory was pioneered by Deci and Ryan in 1970's, out of an interest in studying intrinsic motivation which was defined by the authors as "doing something for its own sake, out of interest and enjoyment". The later elaboration and refinement of the theory was aided by many other SDT scholars worldwide. SDT provides framework for understanding of factors promoting motivation, as well as healthy psychological and behavioural functioning. The theory scrutinises how social, biological and cultural conditions support or thwart the inborn human competence for psychological growth, engagement and wellness (Ryan and Deci, 2017).

SDT can be defined as the macro-level theory and is comprised of six mini theories, which address diverse aspects of human behaviour and personality development. The six mini-theories under the umbrella of SDT includes (a) Cognitive Evaluation Theory (b) Organismic Integration Theory, (c) Causality Orientations Theory, (d) Basic Psychological Needs Theory, (e) Goal Content Theory and (f) Relationships Motivation Theory (Gagné and Deci, 2014; Ryan and Deci, 2017). SDT can be adapted to any discipline and its applications are wide, including in field of sports and exercise (Center for Self-Determination Theory (CSDT), 2018). Scholars had comprehensively studied its conceptual underpinning and developed numerous questionnaires to assess different constructs within the theory.

SDT focuses on how features of its contexts facilitate or hinder the motivations and satisfactions underlying effective self-regulation and wellness. To put it differently, it is concerned with behaviour the lies in the conscious or nonconscious reasons or motives, usually in the form of desires, fears, goals and reflective values (Ryan and Deci, 2017). Therefore, it is practical and has vast applicability within various social contexts insofar, including in exercise and sport sciences researches which identify and measure various types of motivational regulation and the conditions that interact to foster or undermine them. Hence, the renowned authors stated that behavioural outcomes are most easily changed by the motives, goals, expectations or by altering social environments that lead to the elements.

2.2 Search Terms and Databases

A broad range of databases and search engines including Google Scholar, Scopus, PsycINFO, PubMed, and ProQuest were used to search for published journal articles, theses, and books. Literature search was performed using the following keywords: Self-Determination Theory, SDT, GCEQ, BREQ, CSE, goal content, motivation, behavioural regulation, coping, physical activity, and exercise. Boolean operators such as "AND", "OR" or "NOT" was used to search for the search terms individually or in combination. Information relevant to current study was selected and downloaded using EndNote X7, Thomson Reuters.

2.3 Intrinsic Versus Extrinsic Exercise Goals

Goal contents theory (GCT) is concerned with the goals and aspirations which organise lives of people. It critically assesses the degree of one's intrinsic and extrinsic aspirations or life goals. It also has critical perspective on how these goals and aspirations relate to basic need satisfactions, motivations and wellness. People adopt and pursue goals for fulfilment and satisfaction, and the consequences of the different type of goals are manifold.

According to Sebire *et al.* (2008), goal content is an important predictor of the quality of person's behaviour and psychological well-being. The pursuit of what is intrinsically meaningful and satisfies the basic needs, can activate or diminish wellness and flourishing of the person. Therefore, positive outcomes are usually attained with relatively stronger intrinsic, rather than extrinsic aspirations or goals. Simply put, the contents of person's valued goals have an immediate relation to the outcomes, such as well-being and health outcomes. The evidence is strong in a longitudinal experiment, in which the intrinsic values group experienced better well-being (Lekes *et al.*, 2012). The facets include the following (Sebire *et al.*, 2008):

- Social affiliation – represents the goal of forming meaningful or close bonds with others via exercise;
- Health management – reflects the goal to improve health or fitness by performing exercise;
- Skill development – taps the exercise goal of skill development or acquisition through exercise;
- Image – reflects the goal of enhancing outward attractiveness or appearance;
- Social recognition – refers to the aspiration of being noticed and admired through exercise

The first three goals focus on elements inherently valued and realization of individual's potential and growth. Whereas the latter two goals reflect attainment of external worth. SDT postulates that inherent in intrinsic pursuits are satisfactions in one's competence, autonomy, and relatedness (Deci and Ryan, 1985). It is useful to note that most authors have referred goal contents in the context of exercise as motives, or more specifically participation motive. Operationally, both terminologies are identical and can be used interchangeably (Teixeira *et al.*, 2012).

2.4 Autonomous Versus Controlled, External Versus Intrinsic Motivations

There are various types of behavioural regulation or motivation for specific behaviours or domains. It was initially conceived along a continuum from low to high motivation level. Ryan and Deci (2017) described that different forms and phenomenal sources of motivation have varied effects on the experiences and behavioural consequences or outcomes, including the quality of persistence and performance. The basic concern in this context is the degree to which a person feels autonomous in regard to exercising or engaging in physical activity.

These motivations are broadly classified as autonomous self-regulation, controlled regulation, and amotivation (Deci and Ryan, 2000). The dimension used to differentiate types of motivation is called autonomy-control continuum which represents autonomous versus controlled regulations. When a behaviour is autonomously motivated, the individual would have sense of volition, feeling of concurring with and entirely willing to engage in the behaviours. On the contrary, for the behaviours which are controlled, the person would feel externally or internally pressured, forced or compelled to act. When autonomous, behaviours are said to be congruent with respect to the person's sense of self, while controlled behaviours are not. The quality of persistence and performance is higher in autonomous forms of regulation. In addition to the classification above, studies also suggested amotivation, which was re-incorporated for understanding of exercise motivation by Markland and Tobin (2004). According to the authors, amotivation reflects a state of missing any intention to engage in a behavior. It is a completely non-self-determined form of self-regulation.

On the other hand, the concept of external motivation and intrinsic motivation explains motivation with respect to both their inner and outer worlds. External regulation refers to motivation to comply with gaining external reward or avoid punishment. Whereas intrinsic motivation reflects

engagement of the personal value. Figure 2.1 illustrated the self-determination continuum which incorporates both autonomy-control and external-intrinsic concepts.

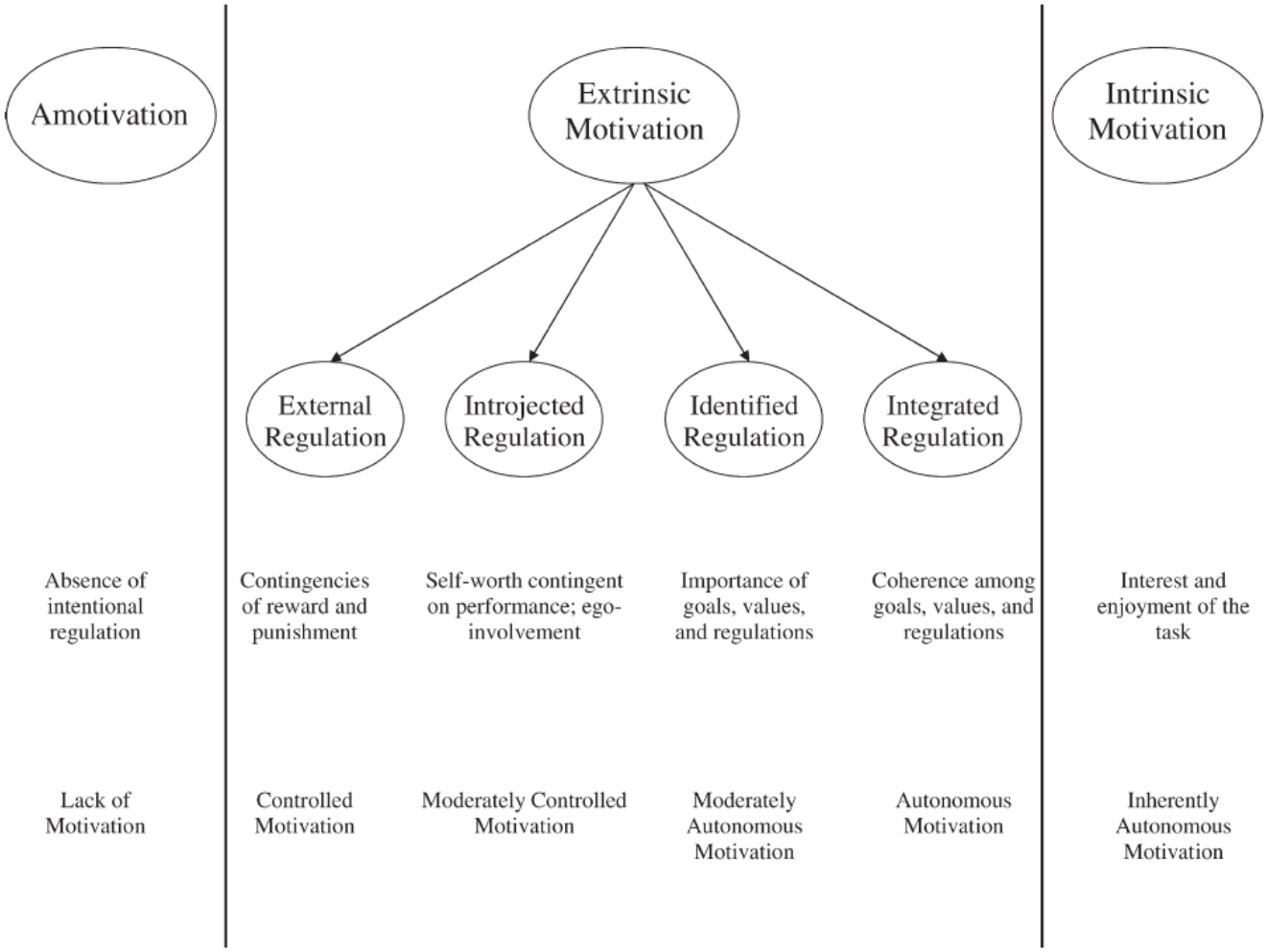

Figure 2.1 Self-Determination continuum

Source: Adapted from Gagné and Deci (2005)

2.5 Coping Self-Efficacy

Naturally certain amount of "pressure' is necessary for performance enhancement. However, when the level exceeds one's ability to cope, it results in stress (Folkman *et al.,* 1986). One may ask, is life of an undergraduate stressful? The findings from previous researches in literature are self-explanatory and could answer the query well. Studies revealed that prevalence of stress was high. For example, the prevalence of stress reported by a study conducted among medical students in

Bangladesh and Egypt were 54% and 62.4% respectively (Eva *et al.*, 2015; Wahed and Hassan, 2017). Various studies were also conducted by researchers in Malaysia and similar trend was observed. It was found that prevalence among undergraduate students ranged between 16.9% and 50% (Yusoff *et al.*, 2010b; Yusoff *et al.*, 2011; Fuad *et al.*, 2015; Phang *et al.*, 2015; Teh *et al.*, 2015; Jia and Loo, 2018). Thus, it is concluded that stress among undergraduates is not uncommon.

Thus, students need to have the resources available to deal effectively with the setbacks. In order to measure students' perceived ability in coping with life challenges, Chesney *et al.*'s coping self-efficacy was used in this study. Folkman *et al.* (1986) highlighted that there are two major purposes of coping. First, to deal with the problematic aspects of the stressful events (problem-focused coping) and managing and regulating emotion (emotion-focused coping). Folkman and colleagues elaborated that problem-focused coping includes active, deliberate, rational efforts to change the situation and solve the problem; emotion-focused coping involves self-controlling, distancing, escape-avoidance, accepting responsibility, seeking social support and positive reappraisal. In Chesney *et al.*'s coping self-efficacy, three common strategies for handling stressful situation were taken into consideration. The execution of a coping strategies or behaviour, irrespective it is proactive or detrimental, depends on the confidence in regulating emotions, thoughts, mood and resources needed to alter the problem (Broadnax, 2016). In current study, the scale was completed in relation to undergraduates' ability to cope with daily challenges in general, not specifically to any specific stressor or physical activity.

2.6 Physical Activities

From perspective of psychology, Ryan and Deci (2017) mentioned in their book that physical activity is one of the most complex but crucial domains of motivated behaviours and human is often intrinsically motivated for doing it. This is because human is meant to be active, playful and

challenge-seeking. Both sport and exercise are counted as physical activity. However, the distinctive feature between them is that, sport is a form of physical activity which is more intrinsically motivated as compared to exercise. However, not all engagement in physical activity is considered enjoyable by the person who perform the activity. That's how the term "workout" is interpreted. Some persist at such activity due to intrinsic goals, for instance, to improve or maintain health, others may be due to extrinsic goals, such as to own a slim and attractive figure. The motives behind might be different from one to the other.

It was said that more than eight in ten adolescents and a quarter of adults are insufficiently physically active worldwide (World Health Organization, 2018c). In the Malaysian context, National Health & Morbidity Survey (NHMS) 2015 which was carried out by Institute for Public Health had reported that the prevalence of physically active adults was 66.5% (Institute of Public Health, 2015). The prevalence of inactive population is much bigger as compared to the world prevalence (World Health Organization, 2018a). According to the global statistics in 2010, there were 23% of adults aged 18 years and above were insufficiently active physically. Proportion in women was higher than the men, 27% and 20% respectively. The trend in gender is similar in our country, in which males were more active than female at 71.1% versus 61.7%.

From all the adults participated in the NHMS 2015, the level of physical activity rose from 16-to-19-year group to 40-to-44-year group. Among the younger adult, the adults aged 16 to 19 years were the least physically active (61.0%) while the group comprises of adults aged 20 to 24 years being the second least physically active (67.9%). More worryingly, occurrence of chronic diseases associated with physical activity, such as hypertension and type-2 diabetes mellitus among adolescents and young adults have increased tremendously in many parts of the world (Mangena *et al.*, 2016; Venecia *et al.*, 2016; BCBS Health Index, 2017; Lascar *et al.*, 2018). The findings

suggest that the magnitude of the diseases needs additional attention. The issue of lack of physical activity among young adults is therefore worth to explore.

2.7 Relationships among Goal Content, Behavioural Regulation, Coping Self-efficacy and Physical Activity

2.7.1 Goal Content, Behavioural Regulation, and Physical Activity

SDT is a framework which focuses on the factors enhancing motivation, as well as healthy psychological and behavioural functioning. As argued by Ryan and Deci (2017), intrinsic goal pursuits are more satisfying of basic psychological needs. On the other hand, extrinsic goals tend to be less autonomously regulated than intrinsic goals. The intrinsic striving was often associated with better wellness outcomes in many different samples, as compared to extrinsic striving. The two renowned scholars then proposed that both content of goal pursuits and reasons why they are pursued would affect basic psychological needs.

As these two components of SDT are closely related and could be confused easily, it is important to be able to differentiate them. Although they appear similar, they are not the same entity. Deci and Ryan (2000) pointed out that the goal content is the "what" of a goal pursuit. It simply means what exercise goal an individual pursues. Meanwhile, behavioural regulation is the "why" of a goal pursuit. In other words, it captures the reason why an individual pursues his or her goal. It is the motivational resources underpinning a behaviour. Scholars examined not only the aspirations that study participants espoused, but also the engagement of behaviours which were consistent with the aspirations (Solberg and Halvari, 2009; Gunnell *et al.*, 2014; Ryan and Deci, 2017). Autonomous regulatory process often found to motivate goal pursuits and hence better outcome attainment. More interestingly, one can hold both more intrinsic and extrinsic types of goals for exercise (Lindwall *et al.*, 2016). There is considerable amount of relevant evidence in the

psychology literature. For example, Thøgersen-Ntoumania *et al.* (2010) found that aspirations had impact upon engagement in unhealthy weight loss behaviours in a group of female adolescents. Sebire *et al.* (2008), in their paper had discussed the relationships between goal content and behavioural regulations for exercising. Not limiting to that, a study in business psychology (Srivastava *et al.*, 2001) suggested potential relationship between money importance and motives for wanting or earning money, which could be viewed as content and reason of the goal pursuit or behaviour.

2.7.2 Goal Content and Physical Activity

Following review on the relationship between the two psychological variables, it is interesting to further review their effect on physical activity. As mentioned in Ryan and Deci (2017), human is inclined to being physically active. Various studies had examined the relationship of aspirations or goals and physical activity participation. In these studies, it was shown that goals have certain impact on physical activity (Ingledew and Markland, 2008; Sebire *et al.*, 2009; McLachlan and Hagger, 2011; Sebire *et al.*, 2011; Gunnell *et al.*, 2014; Seghers *et al.*, 2014; Lindwall *et al.*, 2016), sport and exercise performance (Vansteenkiste *et al.*, 2014). More often, the impact is mediated by behavioural regulation. The association is further discussed next.

2.7.3 Behavioural Regulation and Physical Activity

Motivation is an significant correlate and potential determinant of health behaviours such as physical activity (D'Angelo *et al.*, 2007; Ng *et al.*, 2012; D'Angelo *et al.*, 2014; Gunnell *et al.*, 2014; Kinnafick *et al.*, 2014; Friederichs *et al.*, 2015; Nurmi *et al.*, 2016). Ryan and Deci (2017) posited that to have some intrinsic motivation may be among the most fundamental factors in sustaining exercise. Thus, the component of enjoyment is important for such persistence. Experiencing positive interpersonal interactions during engagement in physical activity is

appealing and supportive. SDT perspectives emphasise on interpersonal relationships in promoting motivation, self-efficacy and behavioural regulation. Example of study which proved the theory is in the work by Buman and his peers (2011). They aimed to examine the effectiveness of peer volunteers in promoting initiation and sustain of physical activity behaviour. The randomized controlled trial showed that at the end of four months, the intervention and control groups are not significantly different in the amount of moderate-to-vigorous physical activity as both had similar significant improvements. However, at the end of 18 months, the intervention group had more substantial improvement while the amount of moderate-to-vigorous physical activity in control group deteriorated as compared to that at the end of four months. The explanation to the relation was autonomous participation led to persistence in physical activity in long term.

Physical activity engagement and persistence is strongly affected by the type of motivation most prominent to the individual at that time. What energizes the individual can range from ego to interest, from goals to appear attractive to become healthy (Ryan and Deci, 2017). Findings of a meta-analysis of studies involving children and adolescents, pointed out that autonomous, controlled motivation and amotivation had different degree of association with physical activity. For autonomous forms of motivation which includes intrinsic and identified regulation, had moderate, positive associations with physical activity, correlation coefficients ranged from 0.27 to 0.38. Meanwhile, the controlled forms of motivation which covers introjected and external regulation, had weak, negative association with physical activity, the correlation ranged between -0.03 and -0.17. On the other hand, amotivation had a weak, yet stronger than that in controlled motivation, also negative relationship with physical activity, correlation coefficient of -0.11 to -0.21(Owen *et al.*, 2014).

2.7.4 Other Inter-Relationships

Students may encounter several possible relevant sources of stress in tertiary education pursuit. In a systematic review conducted by Salam *et al.* (2013), it was revealed that examination and academic-related stressors were the major source of stress among medical students in Malaysia. The result is consistent with the finding from another study involving health science students, which reported that academic requirement is the most prominent stressor (Othman *et al.*, 2013). Thus, to handle the academic stressors on top of other personal or interpersonal stressors, coping strategies play an important role. It had been thought that similar stressors may be perceived differently by different students. The determinants in such phenomena lie in their coping skills, personal traits, experience and cultural background (Yusoff *et al.*, 2010a).

Ryan and Deci (2017) pointed out that physical activity is a source of great recreation and rejuvenation for many people. Nonetheless, a recent study conducted among 258 health professional students to assess prevalence of stress and its stressors, reported that apart from academic stress, long distance walk and lack of time for recreation were the frequently reported stressors (Amanya *et al.*, 2018). In short, some find physical activity useful to release stress. Some may find performing physical activity requires investment of time and energy.

Pertaining to that, another central idea beyond SDT, which was not included in literature review in previous sections is self-efficacy. In Bandura's (1994) theory, perceived self-efficacy is defined as individual's beliefs about his or her capabilities to produce selected levels of performance. The performance may exercise influence over events that affect his or her life. Bandura proposed that self-efficacy beliefs may determine how people feel, think, motivate themselves and behave. The self-beliefs of efficacy bring about the effects on human functioning through four major

psychological processes, namely cognitive, motivational, affective and selection processes. They play a significant role in the self-regulation of motivation.

Bandura (1994) added that self-efficacy beliefs affect motivation in several ways. First, they determine the goals individual sets. Next, the extent of effort, perseverance and resilience to failures. He posited that strong sense of efficacy fosters intrinsic interest and deep engrossment in activities. Self-efficacious individuals view difficult tasks as challenges to be mastered, rather than threats to be avoided. Therefore, it is not surprising to recognise that individuals with high self-efficacy perceive exercise as less physically demanding than their less efficacious counterparts (Poag and McAuley, 1992). In addition, self-efficacy is believed to be an important determinant of one's behaviour and is positively correlated with increased exercise adherence, levels of general fitness and achievement of fitness goal (Jackson, 2010).

It is also known that there are several types of self-efficacies. Rodgers *et al.* (2013) argued that there is some evidence which shows that different types of self-efficacy are associated with exercise behaviour. However, it is unclear which self-efficacy are the most linked to exercise behaviour. In exercise psychology, exercise self-efficacy is often measured. Past researches suggested that exercise self-efficacy, which is one's perception of his or her ability to continue engaging in exercise in the face of possible barriers to participation, was associated with exercise behaviour (Neupert *et al.*, 2009; Nooijen *et al.*, 2015). Tamura (2014) found significant positive associations among physical activity, general self-efficacy and exercise-specific self-efficacy. Further, another interesting point to take note is that the general and exercise-specific self-efficacy are correlated ($r = 0.34$, $P < 0.01$). This supported the hypothesis of general self-efficacy influences domain-specific self-efficacy and vice versa.

Perceived coping self-efficacy was mentioned briefly by Bandura (1994) and it is impacted by the other efficacy-activated processes in the affective domain. Nonetheless, it was less studied in the field of exercise psychology. There is a paucity of study investigate its link to other physical and psychological correlates. Although it is not typical, however is relevant. An example of this is in a study which tested relation of coping self-efficacy, anxiety and subjective performance among athletes by Nicholls *et al.* (2010). The findings revealed that there was significant positive relationship between coping self-efficacy and subjective performance. As far as the researcher is aware, the relationship between coping strategies and physical activity has largely gone unexamined, hence the role that the coping strategies play in affecting physical activity has yet to be clearly elucidated. Although literature suggests that there is an association between exercise self-efficacy and physical activity, the results are not applicable to coping self-efficacy in view of the difference between the two. Therefore, it remains unclear if coping self-efficacy may have effects on physical activity and other psychological variables. Thus, in the current study, researcher is also interested to examine the relationship of physical activity to the strategies of undergraduate in coping with daily challenges.

2.8 Conceptual Framework

Employing the relevant theoretical frameworks and relationships identified from literature review, researcher proposed the following conceptual framework for the present study. It is illustrated as below:

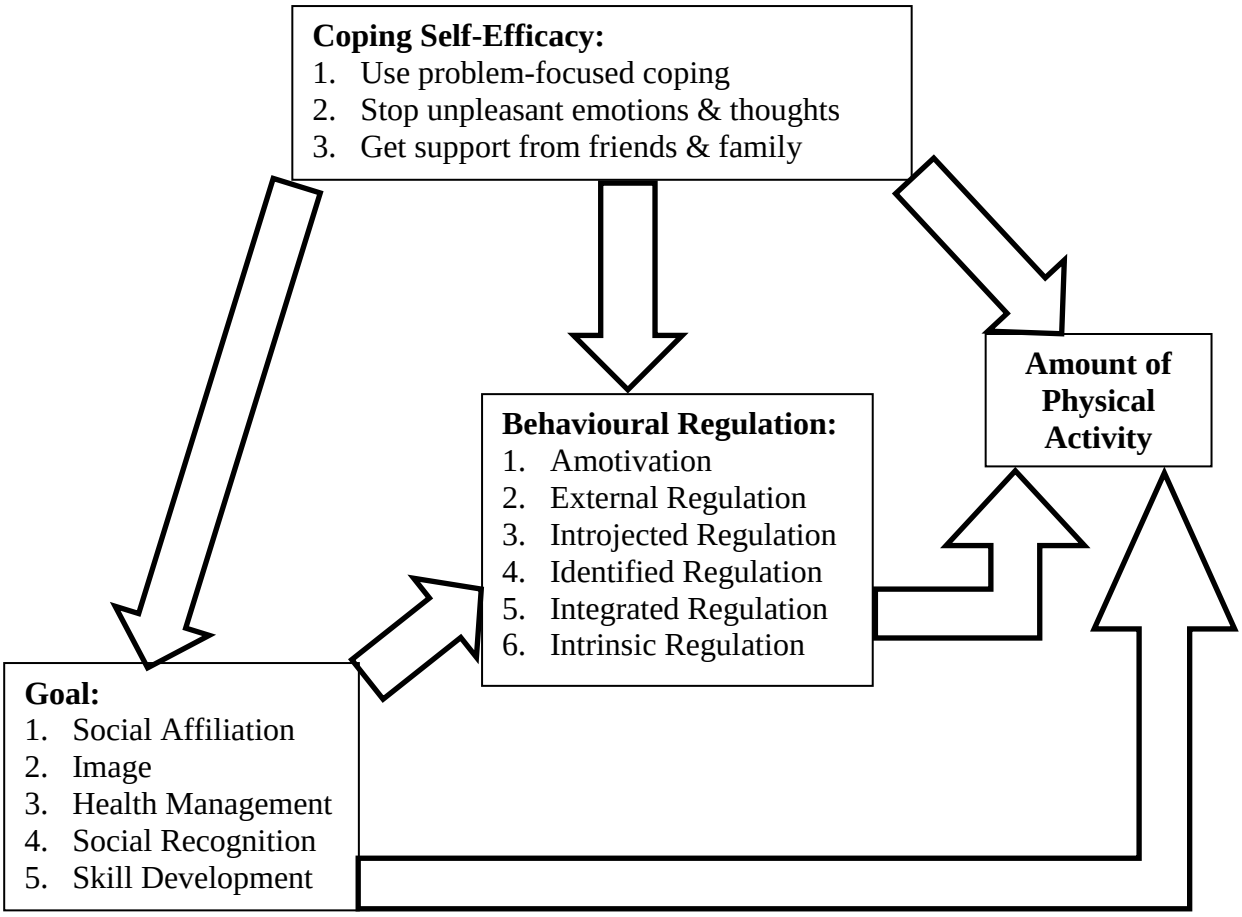

Figure 2.2 Conceptual Framework

2.9 Measurement Tools Related to Goal Content, Behavioural Regulation and Coping Self-Efficacy in Exercise

When performing literature search, researcher had found several questionnaires which measure the outcomes of interest. The questionnaires which might be comparable in measuring the outcome of interest in this study are summarised and presented in Table 2.1. The questionnaires which had been chosen to be used in the present study were examined, to make sure they were suitable to

measure the psychological variables needed in the study. The rationale of selection is described briefly in this section.

Table 2.1 Common Measurement Tools

Aspect	Scale	Description	Source
Goal Content	Goal Content for Exercise Questionnaire (GCEQ)	Comprises 20 items of 5 subscales (4 items each for lower order factors), namely Social Affiliation, Image, Health Management, Social Recognition and Skill Development; The higher order factors: Intrinsic Goals (Social Affiliation, Health Management, and Skill Development) and Extrinsic Goals (Image and Social Recognition)	Sebire *et al.* (2008)
	Exercise Motivation Inventory-2 (EMI-2)	Comprises 51 items which are purported to represent 14 first order factors and 5 higher order factors as follows: Psychological Motives (Stress Management, Revitalisation, Enjoyment, Challenge); Interpersonal Motives (Social Recognition, Affiliation, Competition); Health Motives (Health Pressures, Ill-Health Avoidance, Positive Health); Body Related Motives (Weight Management, Appearance); and Fitness Motives (Strength and Endurance, Nimbleness)	Markland and Ingledew (1997)
Behavioural Regulation	Behavioural Regulation in Exercise Questionnaire (BREQ)	A 15-item scale and includes the following subscales: External regulation, introjected regulation, identified regulation and intrinsic regulation	Mullan *et al.* (1997)
	Behavioural Regulation in Exercise Questionnaire-2 (BREQ-2)	A 19-item scale which includes an additional subscale to measure amotivation (4 items), on top of the BREQ items	Markland and Tobin (2004)
	Behavioural Regulation in Exercise	A 19-item scale which includes an additional subscale measuring integrated regulation (4 items)	Wilson *et al.* (2006)

	Questionnaire-2 Revised (BREQ-2R)		
	Behavioural Regulation in Exercise Questionnaire-3 (BREQ-3)	A 24-item scale which combines BREQ and Amotivation subscale from BREQ-2, Integrated Regulation subscale from BREQ-2R and includes an additional item in Introjected subscale	Markland and Tobin (2004), Wilson *et al.* (2006)
	Multidimensional Work Motivation Scale (MWMS)	Composed of 19-item and 5 subscales assessing amotivation, intrinsic motivation and 3 types of extrinsic motivation (external, introjected, and identified regulation)	Gagné *et al.* (2015)
	Academic Motivation Scale (AMS)	Composed of 28 items and 7 subscales measuring amotivation, 3 intrinsic motivation (intrinsic motivation to know, to accomplish things and to experience stimulation), and 3 types of extrinsic motivation (external, introjected, and identified regulation)	Vallerand *et al.* (1992)
Coping Self-Efficacy	Coping Self-Efficacy (CSE) Scale	Originally consists of 26 items and 3 subscales (Use Problem-focused Coping - 12 items, Stop Unpleasant Emotions and Thoughts - 9 items, Get Support from Friends and Family - 5 items). In the EFA and CFA, 13-item short form of the CSE scale revealed, with 6, 4 and 3 items respectively in the subscales mentioned above (in sequence)	Chesney *et al.* (2006)
	Exercise Self-Efficacy Measure (No specific name addressed by the author)	Consists of 5 item representing negative affect, resisting relapse, and making time for exercise.	Marcus *et al.* (1992)
	Health-Specific Self-Efficacy Scales	Consists of 13 items measuring Nutrition Self-Efficacy (5 items), Physical Exercise Self-Efficacy (5 items) and Alcohol Resistance Self-Efficacy (3 items)	Schwarzer and Renner (2005)
	Self-Efficacy for Exercise	There are 2 subscales: Resisting Relapse (5 items) and Making Time for Exercise (7 items)	Sallis *et al.* (1988)

	Behaviors Scales		
	Self-Efficacy for Exercise (SEE) Scale	Unidimensional with 9 items to measure self-efficacy expectations associated with the ability to persist exercise	Resnick and Jenkins (2000)

GCEQ was supported as an instrument to measure exercise-based goal content. It may help in understanding of how intrinsic and extrinsic aspirations, or goals can motivate exercise behaviour. Comparison of GCEQ and EMI-2 yields the following findings. Originally, EMI was intended to measure motives or reasons for exercising (School of Sport Health & Exercise Sciences and Bangor University, 2007c). However, the latest version of the questionnaire, EMI-2 includes manifest items not only akin to behavioural regulation but also exercise goals facets. The examples highlighted by Sebire *et al.* (2008) discussed about the subscale of Enjoyment, which measures exercise behaviour ("why", i.e. process of exercise motivation) while the Health Pressure subscale is ambiguous and measuring both exercise goal and behaviour (incorporating "what" and "why", i.e. content and process of exercise motivation) (Deci and Ryan, 2000). In addition, the number of item which is substantially larger than that in GCEQ, may cause fatigue in respondents. Analysis might also be difficult when dealing with large number of subscales. Therefore, researcher chose the questionnaire which tapped on the aspirational or goal content, without the interference of the behavioural regulation component, GCEQ. Moreover, it has fewer number of items, subscales and was claimed to develop in concordant with the theoretical advances in SDT (Sebire *et al.*, 2008). Thus, GCEQ might be more appropriate in the current context.

Motivation towards exercise behavior could be measured with several instruments, as listed several among them in Table 2.1. BREQ and its subsequent modifications are more appropriate in assessing physical activity motivation. Consequently, they have become more renowned in