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**A MODEL OF BEHAVIOUR CHANGE IN HOUSEWORK  
FOR WOMEN WITH UPPER LIMB REPETITIVE STRAIN  
INJURY**

By

**Wai Chun Therma Cheung**

A thesis submitted in fulfilment of the requirements  
for the degree of Doctor of Philosophy.

Discipline of Occupational Therapy

Faculty of Health Sciences

The University of Sydney

September 2014

## Declaration

I declare that to the best of my knowledge, the content of this thesis is my own research work and is original. Wherever contributions from others are involved, every effort is made to indicate this clearly with due reference to the literature and acknowledgements. This thesis has not been submitted to any other university or institution previously, either in whole or in parts.

Name: Wai Chun Therma Cheung

A handwritten signature in cursive script that reads "Therma Cheung".

Signed:

Date: 28 February, 2014

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*'If any of you lack wisdom, let him ask of God, that giveth to all men liberally, and upbraideth not; and it shall be given him.'* James Chapter 1 Verse 5

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## List of Abbreviations

AMED	Allied and Complimentary Medicine
ABS	Australian Bureau of Statistics
CTS	Carpal Tunnel Syndrome
CTDs	Cumulative Trauma Disorders
CINHAL	Cumulative Index to Nursing and Allied Health Literature
ECRB	Extensor Carpi Radialis Brevis
ESWT	Extracorporeal Shock Wave Therapy
GT	Grounded Theory
MSD	Musculoskeletal Disorder
NSFH	National Survey of Families and Households
NIWL	(Swedish) National Institute for Working Life
OA	Osteoarthritis
OT	Occupational Therapist
OTs	Occupational Therapists
OT's	Occupational Therapist's
OTs'	Occupational Therapists'
OOS	Occupational Overuse Syndrome
PAPM	Precaution Adoption Process Model
PSOCQ	Pain Stages of Change Questionnaire
PIN	Posterior Interosseous Nerve
RSI	Repetitive Strain Injury
RA	Rheumatoid Arthritis
SALTSA	Samarbetsprogram mellan Arbetslivsinstitutet

TTM	Transtheoretical Model
UED	Upper Extremity Disorder
UEMSD	Upper Extremity Musculoskeletal Disorder
UK	United Kingdom
US	United States of America
VDT	Visual Display Terminal
WHO	World Health Organization
WRMSD	Work-related Musculoskeletal Disorder
WRULD	Work-related Neck and Upper Limb Musculoskeletal Disorder

## **Abstract**

Upper limb repetitive strain injury (RSI) is a costly disease. Evidence indicates biomechanical risk in housework that contributes to this cluster of conditions among women. Although there is consistent evidence indicating the importance of conducting ergonomic education to monitor the mechanical exposures for better musculoskeletal health, there is limited research on understanding behaviour change in housework for women with upper limb RSI.

Occupational therapy has an important role in facilitating behaviour change in housework for women with upper limb RSI, to minimise their exposure to biomechanical risk in housework through ergonomic education. In a hand therapy outpatient clinic in an acute hospital in Singapore, such education is usually conducted by therapists for women with upper limb RSI on a one-to-one basis; planning is based on the clinical experience of individual therapists rather than on a specific theory.

The purpose of this thesis is to construct a model of behaviour change in housework for women with upper limb RSI, to guide the planning of such education within a hand therapy outpatient clinic in Singapore acute care hospital. Framed by a client-centred approach, a central philosophy of occupational therapy, which indicates the importance of ‘listening and communicating’ with clients at all stages of intervention and considering the importance of making therapists’ tacit knowledge explicit while planning an intervention, two grounded theory studies (Study I and Study II) adopting the constructivist approach outlined by Charmaz (2009a) were conducted to construct the model.

Both studies collected data through in depth interviewing. Study I investigated the perceptions of 15 women with upper limb RSI who had received ergonomic education on housework conducted by occupational therapists. The study found that even though women perceived a change in housework was necessary and possible, they would not make a change if they perceived it as emotionally unacceptable when it was disruptive to their habits and routines developed according to the meanings they attached to housework. Also, the factors used by each woman to make decisions on housework were different, according to their specific situations and experiences. The study showed the important effect of the women's self-identity and social role as a homemaker on how they considered advice from the health professionals on making changes in housework. From the findings of the study, a conceptual framework was constructed on their decision making in housework.

Study II investigated the clinical reasoning process of 14 occupational therapists who had conducted such education. There were three main findings of this study. First, therapists perceived that clients go through different stages before they finally incorporate recommended changes into their routines. Second, therapists perceived doubts from their clients regarding their credibility to provide advice on housework. Third, therapists found the limited resources within their clinical environment a challenge for them to 'listen and communicate' with their clients (a major component of client-centred approach). The study showed the effect of therapists' professional roles and personal roles on their interaction with their clients, hence their clients' willingness to change. From these findings, a conceptual framework was constructed on the therapists' clinical reasoning process.



A model of behaviour change in housework for women with upper limb RSI was then constructed by integrating the major concepts from these two frameworks. There are five major constructs in this model. They include the clinical environment, client-therapist interaction, emotional attachment to housework, cognitively informed decisions, and stages of change. With a comparison of the findings from Study I and Study II, a gap in therapists' clinical reasoning process was identified. The first major issue was that therapists lacked a deeper understanding of the meanings women with upper limb RSI attached to housework. Another issue was the time pressure and space limitation within an acute clinical environment which affected the client-therapist interaction that was crucial in clients' willingness to make changes in housework, according to the therapists' advice.

Based on the constructs of the model and the findings of the two grounded theory studies of women with upper limb RSI and the occupational therapists who conducted ergonomic education on housework for them, an assessment was then designed as an initial step to address these issues. A pilot study using a quantitative methodology was conducted to implement this tool for a group of women with upper limb RSI, who were referred to a hand therapy outpatient clinic in an acute hospital in Singapore. The pilot study provided preliminary evidence on the validity of the assessment and its consistency with the model of behaviour change in housework for women with upper limb RSI.

The present research has identified major findings related to the differences in social roles, identity and values caused by a generational gap between women with upper limb RSI and the therapists who conducted ergonomic education for them. Women who

participated in the present research are mainly married with children. They considered their role as a homemaker salient in representing their role as a mother, a wife and a woman. As such, the housework habits and routines they developed through the years become a behavioural representation of these identities. In contrast, therapists who conducted ergonomic education for these women are mostly single, living with their families. They did not attach deep meanings to housework and did not consider housework as representation of their self-identity. The present research found that during ergonomic education, it was mainly the therapists' professional identity that directed how they interacted with clients. As such, they only started to consider the clients' perspective of housework when clients refused to change. Therapists may not have considered the full range of meanings that their clients attached to housework when interacting with them.

While the present research was framed by a client-centred approach, the findings of the studies in this research confirmed its importance. There are three implications for practice. First, therapists need to be trained to gain a deeper understanding of the meanings their clients attach to housework and how to move their intervention towards a client-centred approach, within a clinical environment that is under time pressure. Second, the use of an assessment to provide information on clients' perceptions of and readiness to making a change in housework could be a first step towards better interaction between the therapists and their clients. Third, program evaluation could be the next step to gain organisational support for the intervention to move towards a client-centred approach according to the model. This research is significant not only because it provides a framework of intervention for this particular group of women, but it also sets an example of how research could be conducted to improve other

interventions within occupational therapy practice, by listening to both the voices of clients and their therapists.

## **Chapter 1: Introduction**

### **1.1 Research Background**

For women with upper limb RSI, the biomechanical strain imposed by housework tasks is a threat to the successful management of their condition. Despite evidence on the effectiveness of ergonomic intervention to minimise biomechanical strain in workers with upper limb RSI (e.g. office workers) in paid jobs, there is limited evidence on ergonomic education about housework for women with upper limb RSI. Literature related to ergonomic intervention in housework either emphasizes the importance of it (Maynard & Blain, 2005; Sanders & Morse, 2005) or focus solely on the use of gadgets to save energy (Norman, Kautz, Wengler, & Lyden, 2003; Sandhu, 2003). In a single case study report by Maynard and Blain (2005), the authors reported the struggle of a woman to cope with both paid work and housework after a musculoskeletal injury and advocates the importance of educating women of similar condition on the ways to cope with housework tasks. In another study by Sanders and Morse (2005) on 130 parents with children under the age of 4 years old, they found that 92% of the parents are mothers with 66% of them reporting musculoskeletal pain. The study again advocates the importance of providing intervention for this group of women. Although it was agreed that it is important to provide ergonomic intervention for women with musculoskeletal problems who are involved in housework, evidence found in this area is scant, fragmented and mainly focus on energy saving. In the study by Norman et al. (2003) who compared different vacuum cleaners found significant differences in the physiological stress related to their use and suggested the importance of selecting the right vacuum to reduce physiological stress on women who carry out these tasks on a daily basis. In another study by Sandhu (2003) on 24 females, the author tested the efficiency of selected kitchen gadgets and ergonomic principles to

reduce energy costs and conclude the significant impact of using the right gadgets in carryint out housework tasks. None of these provide evidence related to ergonomic education to facilitate behaviour change for this group of women, and no evidence that is even remotely related could be found in the Singaporean context. According to a study by Kroska (2003), housework consists of 11 household chores. Seven of them are usually specific to women. They include grocery shopping, preparing meals, washing dishes and cleaning up after meals, cleaning a house for the family, washing, ironing and mending the family's clothes, supervising and tending children, and lastly caring for a baby.

Occupational therapy has an important role in facilitating behaviour change in housework among women with upper limb RSI for the management of their condition. Although there are many advantages to planning an intervention based on a theoretical model, no such evidence could be found in occupational therapy research for this group of women.

Framed by a client-centred approach in occupational therapy practice, two qualitative studies were conducted to address this issue. The first study explored the perceptions and experiences of women with upper limb RSI in Singapore, related to housework. The second study explored the clinical reasoning processes of occupational therapists who conducted the education. The conceptual frameworks developed from these studies were then integrated to construct a model of behaviour change in housework for women with upper limb RSI. Based on the model and findings of the studies, an assessment was designed. A pilot study adopting a quantitative methodology was then carried out on a small sample of women with upper limb RSI, to investigate the validity of the assessment, supporting the use of the model to guide the planning of

an ergonomic education programme on housework for women with upper limb RSI in Singapore.

## **1.2 Research Need**

RSI refers to a soft tissue disorder either caused by the overloading of certain muscle groups from repetitive use or by maintaining constrained posture during activities (Australia National Occupational Health Safety Commission, 1986). Upper limb RSI simply refers to the condition's location in the body.

Upper limb RSI is more common in women than in men (Chiron et al., 2008; Dahlberg, Karlqvist, Bildt, & Nykvist, 2004; Ha et al., 2009) and is common, especially among older women (van Eijsden-Besseling, van den Bergh, Staal, de Bie, & van den Heuvel, 2010). As such, this group forms a significant population that is referred to occupational therapy for interventions. A study conducted in a hand therapy outpatient clinic within the occupational therapy department of an acute care hospital in Singapore confirmed this (Yang & Cheung, 2013). The study found, that among 5,607 clients who were referred to the clinic in 2012, 1,108 of them suffered from upper limb RSI, forming a significant percentage (16.5%) of the client population (Yang & Cheung, 2013). Among these clients with upper limb RSI, not only it was found that 827 (75%) were women, forming a major client group in the clinic, but the majority of women fell into the age range of 51–60 years old, followed by the age range of 41–50 and 61–70 years old (Yang & Cheung, 2013). In the same study, it was also found that the largest population groups who suffered from upper limb RSI are professionals (31%), followed by full time homemakers (21%) (Yang & Cheung, 2013). Considering that most professionals in this study are women (80%), and that women still continued to participate in the majority of housework across 34 countries as found in another study

by Knudsen and Waerness (2008), it is highly indicative that the occurrence of upper limb RSI is related to participation in housework.

The presence of biomechanical strain in housework has already been confirmed through research. It results from repetitive movements, awkward postures and the long duration associated with housework tasks (Apostoli et al., 2012; Sala, Mattioli, Violante, & Apostoli, 2007; Yip & Hung, 2002). Consistent evidence indicates the effect of biomechanical strain in housework on the occurrence of upper limb RSI among women who are homemakers (R. R. Habib, Hamdan, Nywayhid, Odaymat, & Campbell, 2006; R. R. Habib, Zein, & Hojeij, 2011; Rosano et al., 2004b; Sala et al., 2007). As such, an important part of occupational therapy intervention in clinics is to educate women with upper limb RSI to make changes in their housework tasks and routines to decrease the overall biomechanical strain imposed.

Although evidence from literature has shown the usefulness of ergonomic intervention and education in decreasing mechanical exposure for computer workers with upper limb RSI (Bleecker, Celio, & Barnes, 2011; Omer, Ozcan, Karan, & Ketenci, 2003; Povlsen, 2012; Ripat, Giesbrecht, Quanbury, & Kelso, 2010; Ripat et al., 2006), similar evidence related to ergonomic education on housework was not found. In order to provide evidence for this ergonomic education on housework, programme evaluations need to be conducted. However, before one can evaluate an ergonomic education programme on housework, it is best to plan the programme according to a theory of implementation. According to Glanz, Rimer, and Viswanath (2008, pp. 25-26):

A health educator without a theory is like a mechanic or a technician, whereas the professional who understands theory and research comprehends the 'why' and can design and craft well-tailored interventions.

Theory-based interventions not only provide a basis for formulating clear criteria during programme evaluation (Grembowski, 2001), they also have potential to generate better outcomes (Brewer & Rimer, 2008). In a clinical environment, where most therapists have less than five years of clinical experience, an intervention that is planned with explicit guidelines is also beneficial to clinical reasoning (Kuipers & Grice, 2009). As such, a model with an explicit framework is crucial to guide ergonomic education on housework for this group of clients.

As an occupational therapist (OT) providing ergonomic education for women with upper limb RSI in a hand therapy outpatient clinic within an acute care hospital in Singapore over the past ten years, I consider women's adherence to advice on making changes to their housework tasks and routines a central concern. The issue of treatment adherence is also shared by many other client educators in health care (e.g. Johnson et al., 2006; Stokes, 2008; van den Bemt et al., 2011). Therefore, a question raised from my practice for this group of women is: What can be done to facilitate adherence to an occupational therapist's advice during ergonomic education on housework? This necessitates understanding women's perceptions and experiences of housework, with a longer term aim of facilitating women's behaviour change during ergonomic education on housework in occupational therapy practice within an acute care setting.

Client-centred practice is a central philosophy of occupational therapy (Rosa, 2009), and includes four major components (Sumsion & Law, 2006): listening and communicating; partnership; choice and hope. The 'listening and communicating' component of *client-centred* practice emphasises understanding clients' perspectives and needs (Sumsion & Law, 2006). It recognises that clients will bring their own perceptions and experiences to interactions with therapists and should be conducted with clients at every stage in planning an intervention (Rosa, 2009).



Therefore, to construct a model of behaviour change in housework for women with upper limb RSI in Singapore, the model needs to consider the perceptions and experiences of this group of women. As the Chinese are a major ethnic group in Singapore, with Chinese women making up 38 per cent of the whole Singapore population (Department of Statistics Singapore, 2013), this research mainly focuses on Chinese women.

To construct a relevant and practical model, understanding the OTs' clinical reasoning processes is essential. Clinical reasoning refers to 'the process that practitioners use to plan, direct, perform, and reflect on client care' (Schell, 2009, p. 314). In occupational therapy practice, tacit knowledge is commonly used by many OT from various fields of practice in their clinical reasoning processes (Carrier, Levasseur, Bédard, & Desrosiers, 2010; Chaffey, Unsworth, & Fossey, 2012; Fleming, 1994; Liedberg, Björk, & Hensing, 2010). According to philosopher Polanyi (1962), tacit knowledge is the knowledge and skills that we know but cannot tell. While an increase in a therapist's tacit knowledge can increase the level of his or her expertise, it does not really contribute to the profession's overall knowledge (Fleming, 1994). As such, it is important to explicate this tacit knowledge of an individual therapist, so it can be shared with others in the profession. Practice contexts affect therapists' clinical reasoning processes (Carrier et al., 2010; Moats, 2006). Therefore, it is important to understand the explicit clinical reasoning process of OTs who conduct ergonomic education on housework in the particular social and cultural context of Chinese women with upper limb RSI within a hand therapy outpatient clinic in an acute care hospital in Singapore.

According to the ecological model of professional reasoning by Schell (2009), therapists use both personal and professional lenses in their clinical reasoning processes (Schell, 2009). While their professional lens is based on knowledge of practice theories

and therapy skills, their personal lens is based on beliefs, values, life experiences, and situations (Schell, 2009). To capture an occupational therapist's clinical reasoning process, when they conduct ergonomic education on housework for women with upper limb RSI, it is important to identify the constructs in both the professional and personal lenses that OTs use in their clinical reasoning processes. This includes the theoretical concepts that OTs use to conduct ergonomic education for this group of women, and their personal perceptions and experiences related to housework.

### **1.3 Research Aims and Questions**

The main aim of this research is to construct a model of behaviour change on housework for women with upper limb RSI that can be used by OT to plan intervention in a hand therapy outpatient clinic. To achieve this, four research questions must be addressed. The long term aim of these research questions is to reorientate therapy practice to integrate an understanding of the women's subjective experiences with RSI in housework and their responses to ergonomic interventions:

1. How do Chinese women with upper limb RSI in Singapore perceive their experiences of housework before and after upper limb RSI?
2. How do Chinese women with upper limb RSI in Singapore perceive their experiences of housework in relation to the changes recommended by the therapists?
3. How do OTs make clinical decisions while conducting ergonomic education on housework for women with upper limb RSI?
4. How do OTs perceive their personal experience of housework?

For a model to be used clinically, empirical evidence is needed to confirm the model's validity (Glanz et al., 2008). For a clinical tool to be used, its validity also needs to be established. As such, a pilot study (Study III), adopting a quantitative

methodology on the implementation of an assessment tool—which was designed based on the constructed model—was then conducted to address the following two research questions:

5. Is the assessment tool valid for use during ergonomic education on housework for women with upper limb RSI?
6. Is there any empirical evidence to support the model of behaviour change in housework for women with upper limb RSI?

#### **1.4 Research Scope**

The studies in this thesis were based on one clinical setting, a hand therapy outpatient clinic within a major government subvention hospital in Singapore. As such, I did not explore ergonomic education for this group of clients in private clinics.

The present research focused only on Chinese women with upper limb RSI, who share a similar cultural background within Singapore. As such, I did not explore issues related to ergonomic education for women of other cultures within Singapore.

#### **1.5 Research Significance**

This research has allowed the voices of women with upper limb RSI to inform practice. It has generated three main outcomes. First, it has led to the construction of a model for behaviour change in housework for women with upper limb RSI, which can be used as a guide for OTs to plan ergonomic education for this group of women. Second, a comparison of the findings from the studies identified important clinical reasoning gaps of OTs that challenge successful implementation of a client-centred approach for this group of women. Third, the present research provides an example of how research could be conducted in other occupational therapy clinical areas, to facilitate a client-centred approach.

## 1.6 Thesis Overview

There are nine chapters in this thesis. In this chapter, I have outlined the research background, the need for it and its significance. I have also stated the research aim and research questions, based on the described research need.

In Chapter Two, I provide a review of the existing body of knowledge relevant to the research themes of this thesis, which leads to the four main research questions to be addressed so a model of behaviour change in housework can be constructed. Chapters Three to Five present the methodology and findings of the two main qualitative studies that were conducted, addressing the first four research questions. Both studies (Study I and Study II) adopt a constructivist grounded theory methodology. While Study I focuses on women with upper limb RSI, Study II focuses on OTs who conduct ergonomic education on housework for them. In Chapter Three, I describe the research design, data collection and data analysis methods for Study I and Study II, and justify the selection of a constructivist approach in the methodology. In this chapter, I also describe the setting where the research was carried out, the method of participant recruitment, data collection, data analysis and various strategies used to ensure the rigour and quality of these studies. In Chapter Four, I present the results, analysis and discussion of the first grounded theory study of women with upper limb RSI (Study I). In this chapter, I also present a conceptual framework of these women's decision making in housework. In Chapter Five, the results, analysis and discussion of the second grounded theory study of OTs (who conduct ergonomic education on housework) are presented (Study II). In this chapter, I also present a conceptual framework of the OTs' clinical reasoning process when they conduct the education program.

In Chapter Six, the major constructs in the two frameworks described in Chapters Four and Five are compared and integrated to construct a model of behaviour change in housework for these women. In Chapter Seven, the development of an assessment tool to address a gap in therapists' clinical reasoning processes during ergonomic education on housework for women with upper limb RSI is described. A pilot study on the implementation of this tool on a group of women with upper limb RSI, which provides some preliminary evidence to support the use of the constructed model and the initial validity of the assessment tool, are also presented.

In the final chapter, Chapter Eight, I summarise the model and its findings, followed by their implications for occupational therapy practice. In this chapter, I also present the possible challenges that an occupational therapist may encounter while trying to translate such knowledge to occupational therapy practice in an acute health care setting. Specific recommendations for practice are then made, before recommendations for future research are presented.

## **Chapter 2: Literature Review**

### **2.1 Introduction**

In this chapter, I will critically evaluate the available literature and identify the gaps that led to the first two studies in this thesis. The first part of this chapter clarifies what upper limb RSI is, the diagnostic classification system adopted within this thesis, and describes the methodology used for article extraction.

The second part of this chapter examines the evidence regarding the prevalence and cost and risk factors of upper limb RSI, especially among women and in housework-based activities. The role of housework in upper limb RSI, and its socio-cultural context, will also be presented. I then present the evidence on ergonomic interventions for people with upper limb RSI, before concentrating on those related to women and housework.

In the third part of this chapter, I will identify the research gaps based on the presented evidence and the relationship to occupational therapy practice. This will then inform the research direction in occupational therapy practice, regarding ergonomic education for women with upper limb RSI in Singapore, providing impetus for the qualitative inquiries and conceptual framework development in this thesis.

### **2.2 What is Upper Limb Repetitive Strain Injury?**

RSI has many alternative names, such as cumulative trauma disorders (CTD), occupational overuse syndrome (OOS). As such, clarification is warranted prior to reviewing the literature related to this cluster of conditions. RSI refers to ‘a soft tissue disorder caused by the overloading of particular muscle groups from repetitive use or maintenance of constrained posture’ (Australia National Occupational Health Safety Commission, 1986). This definition attributes the injury to biomechanical exposure that

has resulted in either frequent repetitive movements of the limbs, or the maintenance of fixed postures for long periods (W. Hall & Morrow, 1988).

The term RSI will be used for this group of women who engage in housework. This term does not limit the definition to paid work, and can include unpaid work, such as that carried out in the home. Also, the term RSI suggests that the repetitive nature of tasks is one of the most important factors related to this condition. This is consistent with the suggestion that the consistency and repetitive nature of housework is one of the main causes for RSI in women (R. R. Habib et al., 2006; R. R. Habib et al., 2011; Rosano et al., 2004a; Sala et al., 2007).

The term RSI is more commonly used in Australian literature (Bammer & Martin, 1992; Ewan, Lowy, & Reid, 1991; W. Hall & Morrow, 1988; Hocking, 1987; Hopkins, 1990; M. H. Miller & Topliss, 1988; Quintner, 1995) since its first use 'in 1982 in a report from the Australian National Health and Medical Research Council' (Tyrer, 1998, p. 175). Alternative terms commonly used in recent literature include: Musculoskeletal Disorders (MSDs) (Dahlberg et al., 2004; R. R. Habib et al., 2006; Johnston et al., 2008); Work-Related musculoskeletal disorders (WRMSDs) (Barr, Barbe, & Clark, 2004; Hansson et al., 2009; Naidoo & Haq, 2008), CTDs (Armstrong, McMahon, West, & Lewis, 2005; Gangopadhyay et al., 2003; Goodman et al., 2012) and OOS (Jaye & Fitzgerald, 2011; Laoopugsin & Laoopugsin, 2012; White, Hayes, Jamieson, & Pilowsky, 2003)

Upper limb RSI simply refers to the location of the condition in the body. There are also many alternative terms that describe the condition. These include: upper extremity musculoskeletal disorders (UEMSDs) (Arvidsson, Akesson, & Hansson, 2003) or work-related neck and upper limb musculoskeletal disorders (WRULDs) (Buckle & Devereux, 2002) or upper extremity disorders (UEDs) (Huisstede, Bierma-

Zinstra, Koes, & Verhaar, 2006). All refer to a similar cluster of conditions in the upper limbs. Despite extensive research focusing on this cluster of conditions, researchers have not agreed upon a universally recognised or accepted term. Adding to this confusion are variations in the diagnostic classification systems used in different literature. Van Eerd et al. (2003) reviewed a total of 27 classification systems used to define upper limb MSDs in workers, and found that each of these systems differed.

Two classification systems have been proposed that provide clear criteria for inclusion of diagnostic groups. These have resulted from extensive collaboration by experts in the field. One is the classification system developed by 47 experts of UEMSDs in the Netherlands (Huisstede, Koes, Miedema, Verhaar, & Verhagen, 2007). This system includes 23 disorders using three criteria: diagnosable, not caused by acute trauma, and not caused by any systemic disorders.

Another classification system was offered by a group of European experts who worked under the Samarbetsprogram mellan Arbetslivsinstitutet, LO, TCO och Saco (SALTSA) programme established by the Swedish National Institute for Working Life (NIWL) (Sluiter, Rest, & Frings-Dresen, 2001). They used three criteria for the inclusion of 12 diagnostic groups. Similar to the Netherlands classification, one classification criteria is a well-defined diagnostic criterion. In contrast to the Netherlands classification system, which has a more general exclusion of conditions caused by acute trauma and systemic disorders, the NIWL classification includes only specific diagnoses supported by evidence as work-related. An additional criterion of the NIWL classification is the inclusion of diagnostic groups only when they are highly prevalent.

Comparing the two classification systems, the NIWL classification system provides much clearer and more specific criteria for the inclusion of diagnostic groups



with respect to the work-relatedness of the conditions, than does the Netherlands classification system. Also, as the NIWL classification system includes conditions of high prevalence only, these diagnoses are commonly seen in occupational therapy clinics. Therefore, this classification is adopted within this thesis.

Twelve diagnostic groups are classified as upper limb WRMSDs (Sluiter et al., 2001) under the NIWL classification system, referred to as upper limb RSI within the context of this thesis. They include: radiating neck pain, rotator cuff syndrome, medial epicondylitis, lateral epicondylitis, ulna nerve entrapment in the cubital tunnel, radial tunnel syndrome, flexor and extensor tendinitis at the hand and fingers, De Quervain tenosynovitis, carpal tunnel syndrome, ulnar nerve entrapment in Guyon's tunnel, Raynaud's phenomenon or peripheral neuropathy related to vibrations of the hand and arm, and osteoarthritis of the elbow, wrist, and fingers.

## **2.3 Methodology**

In this section, I will list the databases and the keywords used for the literature search on the different topics covered in this review. The databases are listed in Table 2.1.

### **2.3.1 Data bases.**

The databases were chosen based on the extent coverage of health sciences and social sciences literature in relation to the research topic.

Table 2.1

*Databases and Their Descriptions*

<b>Database</b>	<b>Description</b>
Medline	A major literature source for medical sciences
Cumulative Index to Nursing and Allied Health literature (CINAHL)	A major literature resource for allied health professionals and nurses
Allied and Complimentary Medicine (AMED)	A specialised database for health professionals covering alternative to conventional medicine
Web of Science	The largest science database in humanities and sciences
Scopus	A multi-disciplinary database in humanities and sciences
OTSeeker	A database on systematic reviews related to occupational therapy
Google Scholar	A search engine that covers scholarly literature across a wide array of disciplines

**2.3.2 Search strategy.**

A keyword search was conducted based on terms in the literature for 'RSI' and 'upper limb RSI'. I then proceeded to search articles on each topic and combined keywords for different topics as appropriate (see Table 2.2). Although no limitation was put on the search date range, I emphasised identifying and reviewing recent evidence with the last search carried out on 2 January 2014. Relevant articles extracted from these searches were filtered according to their relevance based on the abstracts. Full text articles were then reviewed; these are presented in Section 2.4 to 2.6 of this chapter.

Table 2.2

*Keywords Search for Review Topics*

<b>Client group and Diagnosis</b>	<b>Keywords</b>
RSI	Repetitive strain injury, cumulative trauma disorder, OOS, musculoskeletal disorder, work-related musculoskeletal disorder
Upper limb RSI	Upper extremity, upper limb, neck and upper limb
Women with upper limb RSI	Female, gender
<b>Topic</b>	<b>Keywords</b>
Cost, prevalence and risk of RSI and upper limb RSI	Cost, epidemiology, prevalence, incidence, mental health, quality of life, wellbeing
Housework	Housework, domestic labour, home maintenance
Management of RSI and upper limb RSI	Intervention, medical treatment, surgical treatment, therapy
Ergonomic interventions	ergonomic , human engineering

## 2.4 Upper Limb RSI

In this section, I will present a critical review of the evidence related to the prevalence, cost (financial and personal) and risk factors for upper limb RSI.

### 2.4.1 Prevalence of upper limb RSI.

Many prevalence studies on upper limb RSI have been conducted over the past ten years. Some were conducted on the general population, with a mixed group of people in both paid and unpaid jobs. A cross-sectional survey on 5,133 adults in North Staffordshire, United Kingdom (UK) from a random sample of 10,000 adults, found that the prevalence of neck and upper limb pain over a one month period was 44 per cent (Sim, Lacey, & Lewis, 2006). Another study on a general population with a sample size of 6,038 men and women, in Southampton in the United States (US), drawn from 9,696 randomly selected adults of working age, found that out of 6,038 responders, 1,354 individuals reported symptoms confirmed as upper limb RSI with physical

examinations at the point of interview, amounting to a point prevalence rate of 22.4% (Walker-Bone, Palmer, Reading, Coggon, & Cooper, 2004). The lower prevalence rate in the Southampton study is expected as this study reports a point prevalence rate, compared to the one month prevalence rate in the North Staffordshire study.

In an Asian context, a national survey was conducted in 1998 in Taiwan on a general population of 17,669 individuals using a cross-sectional design. Cases of upper extremity musculoskeletal pain were identified through interviews by trained interviewers, based on the respondents' self-report of pain symptoms. However, no physical examination was conducted to confirm these reports (Lee, Yeh, Chen, & Wang, 2005); as such, the actual one year prevalence rate of upper limb musculoskeletal disorders could be lower than the 37.3% reported, based on the presence of musculoskeletal pain as an indicator (Lee et al., 2005). Although all three studies described a focus on the general population of a geographical location, comparison of these prevalence rates is not possible as they used different periods to report the prevalence rates. Some reported one year prevalence rates, while others reported one month or point prevalence rates.

Sometimes the comparison of prevalence rates of upper limb RSI is made even more difficult due to differences in the populations being investigated. Similar to the Southampton study mentioned above (Walker-Bone et al., 2004), a study conducted on 3,710 people in paid work in a French region in 2002–2005, also investigated the point prevalence rate of upper limb RSI. With the use of both questionnaires and standardised physical examination by 83 trained occupational physicians, this French study found that 472 workers suffered from at least one or more upper limb musculoskeletal disorders, a point prevalence rate of 13 per cent (Roquelaure et al., 2009), much lower than the 22.4% reported by the Southampton study. The main reason for the difference

in point prevalence rate between this study and the Southampton study could be because of the different population under investigation. While the Southampton study was conducted on a general population (not excluding the non-working), the French study was conducted only on a working population. Another reason for the difference could be due to the more stringent use of standardised examination in the French study than the Southampton study. Regardless of these differences, these studies reported a high prevalence rate of RSI in their samples.

Apart from the variations in the time frame used to report prevalence rates, there are two other issues that make comparisons of prevalence rates in different studies difficult. The first is the use of different criteria and methods to identify cases in these studies. For example, some studies use only a self-reported questionnaire. Without physical examination to confirm the diagnosis, this may lead to inaccurate reports, with inaccurate prevalence rates reported.

The second issue is the use of different terminology and diagnostic classification systems in the literature. In a systematic appraisal of 13 studies covering countries such as Australia, US, Sweden, Canada, Netherlands, Great Britain and Italy, with data collection on the prevalence of UEMSDs between 1985 and 1998, the reported prevalence rates fell into a wide range. The point prevalence of UEMSDs ranged from 1.6% to 53 per cent, and the reported one year prevalence ranged from 2.3% to 41 per cent. The authors suggest the problem lies in huge variations in case definitions (Huisstede et al., 2006).

In summary, despite the issues and variations in the reporting of prevalence rates and differences among these studies, there was agreement on the high prevalence rate of upper limb RSI in both the working and general population. With its high

prevalence rate in the population, upper limb RSI imposes a major burden on both society and individuals.

#### **2.4.2 Cost of upper limb RSI.**

RSI is costly in terms of its health care expenditure, compensation costs and productivity loss. In 2001 in the US, musculoskeletal disorders were responsible for 33 per cent of all workplace injuries and illnesses that required time away from work in private industries (U.S. Bureau of Labor Statistics, 2011). It was also estimated that the economic burden of WRMSDs was in the range of US\$45–54 billion per year when compensation costs, lost wages and lost productivity were taken into account (National Research Council and the Institute of Medicine, 2001). In Australia, around AU\$4.6 billion of health expenditure in the financial year 2001/2002 was estimated to have been spent on MSDs, with \$1.2 billion spent on osteoarthritis (OA) alone (Australian Bureau of Statistics, 2006). This amount, although not exclusive to upper limb RSI, indicates its costliness.

In Singapore, although there is no data available on the estimated economic burden of upper limb RSI, it was reported that musculoskeletal diseases are responsible for 4.8% of the total disease and injury burden in 2004 (Epidemiology & Disease Control Division of Ministry of Health Singapore, 2009). In a study conducted in Korea using a wide range of statistics within that country, the total economic cost of musculoskeletal disease was estimated at US\$6.89 billion (Oh, Yoon, Seo, Kim, & Kim, 2011). Again, although these amounts reported are not exclusive to RSIs, they indicate the costliness of this cluster of conditions.

Although literature on the cost of upper limb RSI is comparatively less than those on RSI, this is a general indication of the social and individual cost the condition imposes. Among studies on the cost of upper limb RSI, most focused on workers'

compensation claims based on data reported by government bodies. In a study using data based on claims incidence of work-related upper extremities, submitted to the Department of Labor and Industries, industrial insurance from 1987 to 1995 in the US state of Washington alone amounted to 186,232 claims, with an average of 20,693 claims per year (Silverstein, Welp, Nelson, & Kalat, 1998). Another study used the 1994 database of accepted claims for occupational UEDs by Office of Workers' Compensation Programs (OWCP) of the US Department of Labor (Feuerstein, Miller, Burrell, & Berger, 1998). This study reported that, although the incidence of claims on upper extremity diagnosis was a low 4.4%, the health care cost in claims for two of its major diagnoses were responsible for approximately 73 per cent of the total health care cost of upper limb RSI. This cost amounted to US\$12,228,755 (Feuerstein et al., 1998). Although more recent literature, specifically on the health care cost of upper limb RSI could not be found (most studies focus on RSI as a group), the studies' results reflect the high health care cost of upper limb RSI.

Upper limb RSI is costly not only because of its health care cost, but also because of the loss of productivity, a common result of the condition. A study by Pransky, Benjamin, Hill-Fotouhi, Fletcher, and Himmelstein (2002) reported that out of 72 workers with work-related UEDs in New Hampshire in the US, 60 per cent had lost more than one week of work. Another study by van den Heuvel, Ijmker, Blatter, and de Korte (2007), reported that productivity loss in the form of sickness absence occurred in 11 per cent of the arm and hand cases, 32 per cent in the neck and shoulder cases and 43 per cent for both symptoms. Yet another study conducted in a French company reported loss of productivity in terms of incidence rate of absence (six episodes per 1000 person-years) (Wilson d'Almeida, Godard, Leclerc, & Lahon, 2008). Although these studies

agreed that productivity loss due to upper limb RSI was significant, the different ways that productivity was measured in these studies is problematic for cost comparison.

Although the above studies agreed that upper limb RSI is costly in the working population, they focused only on productivity loss before the injured person's first return to work. A study that included subsequent injury-related absences reported that among workers with CTD who were absent at least once, 26 per cent also had a second injury-related absence (Baldwin & Butler, 2006). This suggests that most studies on upper limb RSI could be underestimating its cost in terms of productivity loss.

Upper limb RSI is not just costly to society in terms of health care expenditures, compensation cost or productivity loss, it is also costly to the individual at a personal level. In reality, not everyone with upper limb RSI applies for workers' compensation. Also, not everyone receives compensation that covers their full health care expenditure. In a population based survey of 3,200 out of 1,520,000 working adults in Connecticut, US, it was found that although 292 of them reported WRMSDs, only 10.6% filed for workers' compensation (T. Morse, Dillon, Warren, Levenstein, & Warren, 1998). The study also found that the respondents spent an average of \$489 annually out of their own pockets for medical bills as a result of the condition (T. Morse et al., 1998). In a subsequent study of a more recent period, T. Morse et al. (2005) continued to find the same pattern of under-reporting of MSDs. Based on data from seven years of workers' compensation and physician reports (1995–2001) in Connecticut, only 5.5% to 7.9% of MSD cases were reported to workers compensation authorities annually (T. Morse et al., 2005).

While many individuals with RSI still have to pay for their medical bills from their own pockets, this burden is sometimes further affected by discrimination issues at work. A study by Armstrong et al. (2005) found that people with CTD faced more



discrimination issues related to layoff, failure to reinstate and failure to provide reasonable accommodation at the work place, compared to people who experienced other forms of impairment. Job loss is a common problem among people with RSI; a study of 537 workers' compensation claimants in Maryland, US also found that 38 per cent of the respondents reported loss of jobs (Keogh, Nuwayhid, Gordon, & Gucer, 2000).

Upper limb RSI not only creates a financial burden on individuals in terms of health care expenditure and loss of jobs, it also affects the individual's wellbeing. In a qualitative study on sixteen university students with UEDs, students reported that their physical and emotional wellbeing was compromised (Cortes, Hollis, Amick, & Katz, 2002). Results from other studies also agreed with their findings. A study in Crete, Greece, found that depression was strongly correlated with MSD among those who attended a rural primary centre (Antonopoulou, Alegakis, Hadjipavlou, & Lionis, 2009). Another cross-sectional survey on 1,121 people with RSI also found that mental health, physical role functions, emotional role function, pain and vitality were all negatively affected (Sluiter & Frings-Dresen, 2008). In the study, SF-36 scores were found to be significantly lower for those with musculoskeletal diseases compared to those without, and particularly in physical functioning (SF-36 score (SE) 75.2(0.5) v 87.8 (0.5), role limitation 67.1 (0.9) v 85.8 (0.8), as well as bodily pain (68.5 (0.5) v 84.1 (0.5) (Sluiter & Frings-Dresen, 2008).

Despite the methodological differences in the above studies making comparisons of results difficult, research outcomes to date consistently agree on the high cost of upper limb RSI on society in terms of health care costs, compensation cost and loss of productivity. Studies also show significant personal cost in terms of job loss, financial burden, role disruptions and emotional effects as a result of the condition.

### **2.4.3 Work-related risk factors of upper limb RSI.**

Due to the high prevalence and costliness of upper limb RSI, many studies were carried out to explore its associated risk factors with the hope of prevention through the design of effective interventions. A major review by the US National Institute for Occupational Safety and Health (1997) was one of the first to report the work relatedness of this cluster of conditions. Since then, many reviews have concurred with its findings. One such review was conducted by Buckle and Devereux (2002). Based on information from peer reviewed journals, conference proceedings, government as well as regulatory reports, they concluded that ‘there was evidence to suggest that a reduction in exposure to biomechanical load resulted in the subsequent reduction of the prevalence of musculoskeletal disorders in the workplace’ (Buckle & Devereux, 2002, p. 213). They considered this evidence an important support for the work-relatedness of this cluster of conditions, as they were reviewed and supported by 39 out of 40 experts, research groups and organisations across the European Union.

Among the reviews on the specific risk factors of upper limb RSI, a majority focus on identifying physical factors. Three common work-related physical risk factors of upper limb RSI have been identified by these reviews (Aptel, Aublet-Cuvelier, & Cnockaert, 2002; Barr et al., 2004; Muggleton, Allen, & Chappell, 1999; Palmer, 2003; Punnett & Wegman, 2004; Rosecrance & Cook, 1998; Staal, de Bie, & Hendriks, 2007; Walker-Bone & Cooper, 2005). They include: excessive repetition, excessive force and awkward postures. Despite their focus on physical risk factors, all these reviews agreed on the multi-factorial aetiology of upper limb RSI, suggesting the important role of psychosocial factors such as work stressors (Punnett & Wegman, 2004) and individual factors such as gender and age (Rosecrance & Cook, 1998).

Although there is agreement that psychosocial and individual factors play a role in the aetiology of upper limb RSI, not many reviews focused on these factors. One review on the psychosocial and personal risk factors of upper limb RSI by Bongers, Ijmker, Heuvel, and Blatter (2006) concluded that although studies showed psychosocial factors such as high work demands or little control at work are often related to symptoms of upper limb RSI, the relationships are neither strong nor specific. The same review also concluded there was too little research available to draw any conclusion on the relationship between individual risk factors and upper limb RSI.

Since this review, a number of studies have explored and attempted to confirm the role of psychosocial risk factors in the aetiology of upper limb RSI. One study investigating occupational stress on 518 workers in a high fashion clothing industry (433 of them being women), demonstrated that psychosocial factors played an important role (Forcella et al., 2012). They found that perception of low decision latitude leads to job strain, which is positively correlated with the perception of upper limb musculoskeletal disorders (Forcella et al., 2012). Another study carried out on participants who attended a physical practice centre (Karels et al., 2007) explored how psychosocial factors could affect the prognosis of upper limb RSI. With complete data collection on 543 participants with neck and upper extremities pain or discomfort, they not only confirmed that low decision authority at work (for those with paid jobs) is significantly related to the persistence of upper limb symptoms, but other psychosocial factors such as somatisation, kinesiophobia and catastrophising also play a significant role (Karels et al., 2007). There is evidence regarding the work related risk factors of upper limb RSI, however to date this has not been articulated into a specific conceptual framework. This represents a gap in current knowledge and in guiding intervention.

#### **2.4.4 A summary—prevalence, cost and risk of upper limb RSI.**

Upper limb RSI is a costly disease. Its high prevalence rate imposes a heavy financial burden on society and individuals. It also affects individuals' wellbeing both physically and emotionally. There is support for a multi-factorial aetiology of upper limb RSI, involving the interplay of physical, psychosocial and individual risk factors. The three main physical risk factors identified are biomechanical and include excessive repetition, excessive force and awkward postures. These provide understanding of why work context and demands are relevant in explaining the occurrence of upper limb RSI.

### **2.5 Women with Upper Limb RSI and Housework**

The evidence examined so far has focused mainly on both genders and on paid work. In this section, I will present evidence on the prevalence and risk of upper limb RSI among women, with a special focus on those with unpaid duties such as housework.

#### **2.5.1 Prevalence of upper limb RSI in women.**

RSI is more common in women than in men (World Health Organization, 2006a). The incidence of upper limb RSI was also higher in women than in men in a major review of 56 articles published from 1981 to 2002 (Treaster & Burr, 2004). Based on 26 studies that used both self-report and physical examination as measures, the review found that with men as the referent, the odds or prevalence ratio of UEMSDs in women ranged from 0.66 to 11.4. Among these 26 studies, 70 per cent of the prevalence rates or odds ratios of MSDs reported on various locations of the upper limbs showed a significantly higher prevalence in women than in men. These ratios were adjusted for confounding factors such as age and physical work, validating the higher prevalence rate of upper limb RSI in women than in men. Since the review, other recent studies have also generated evidence supporting a higher prevalence of upper

limb RSI in women than in men (Chiron et al., 2008; Dahlberg et al., 2004; Ha et al., 2009)

Not only is upper limb RSI more prevalent in women, its occurrence in elderly women could also increase the chance of disability. In a recent retrospective cross-sectional study on 104 computer workers with upper limb RSI, being both female and older were risk factors for disability for this cluster of conditions (van Eijsden-Besseling et al., 2010). Although upper limb RSI is more prevalent in women than in men, and is associated with a risk of disability with its occurrence in older women, research in this area is still limited. According to a report by World Health Organization (2006b), there is a gender bias in occupational health research: women are not receiving the research attention they deserve.

### **2.5.2 Risk of upper limb RSI for working women—the role of unpaid duties.**

A number of studies have examined the risk factors of upper limb RSI in women. Some studies focus on the physical risk factors related to upper limb RSI for women in paid jobs. The identified common risk factors in these studies include:

- excessive force and repetition with prolonged exposure (Chen, Chang, Liu, & Chen, 2009)
- excessive repetition with high frequency movements of the upper limbs (Arvidsson et al., 2003; Hansson et al., 2000)
- posture-related risk factors with prolonged exposure, as well as psychosocial factors such as negative affectivity and individual factors such as age (Johnston et al., 2008).

The physical risk factors identified in these studies are similar to those involving both genders, as described in the previous section.

Although most of these studies focus only on paid work carried out by women, women's unpaid duties were often suggested as an explanation of the higher prevalence rate in upper limb RSI. A study on 60 female supermarket employees found that non-work adverse life events and stress were positively associated with the presence of musculoskeletal UEDs, suggesting that it is necessary to understand the inter-relational nature of women's lives in managing their condition (Vroman & MacRae, 2001). A review carried out by Lundberg (2002) also suggested that stress from unpaid duties such as housework and child care could explain the higher prevalence of work-related UEDs in working women.

Child care as a risk factor for upper limb RSI for working women was supported by two studies. In a study by Bjorksten, Boquist, Talback, and Edling (2001) on 173 Swedish female blue collar workers, among other physical and psychosocial risk factors, women with a partner and children less than 13 years old had an increased number of musculoskeletal problems of their neck and shoulder. This was supported by the findings of an earlier study by Bergqvist, Wolgast, Nilsson, and Voss (1995), who reported that the risk of having a musculoskeletal diagnosis of the neck and shoulder was higher for women with children under 16 years old of age than those without. These studies demonstrated that home strain in the care of children could play a part in increasing the risk of upper limb RSI for women in the working population.

Although these studies suggested that housework, and other unpaid activities such as those related to child care, may contribute to women's high prevalence rate in upper limb RSI, these reasons have not been closely examined. This raises a number of questions: for example, if women are doing more housework than men, what is the risk of upper limb RSI among women who engage in housework, and what are the specific risk factors of upper limb RSI related to housework.

### **2.5.3 Women's participation in housework.**

Research related to the division of labour in housework emerged in 1974 when Oakley published *The Sociology of Housework*, based on a study interviewing 40 young urban housewives in the US. She revealed a major inequality in the distribution of housework that existed between men and women (Oakley, 1974b). Although there is some evidence this inequality may have decreased in recent years, it still exists, and women are responsible for the majority of housework in the home. This claim is examined and supported in the following paragraph.

One study in the 1990s showed that although women did around three to seven per cent less housework hours than women in the late 70s, they were still responsible for 60 to 64 per cent of the total housework hours in homes (Ferree, 1991). In fact, since the 1970s, all studies and reviews that investigated gender ideology and household labour agreed that women still carry out the majority of housework at home (Cunningham, 2008; Ferree, 1991; Grote, Naylor, & Clark, 2002; Hank & Jurges, 2007; Knudsen & Waerness, 2008; Pimentel, 2006). More recently, in a major review of housework distribution in 34 countries using data extracted from the International Social Survey Program, married women performed a mean of 21 hours of housework per week, compared to 7.77 hours carried out by men (Knudsen & Waerness, 2008). The mean division of housework between men and women was 1:3.9 (Knudsen & Waerness, 2008). Although evidence from this study confirmed that in many socio-cultural environments, women have continued to do more housework than men both historically and currently, variations in the time spent on housework by women in these different countries were also observed. In summary, these studies revealed that although women still continue to carry out the majority of housework, there are variations in housework distribution across countries and through different eras.

Sikic-Micanovic (2001) suggested that housework meanings vary according to historical and socio-cultural contexts. As such, a universalising framework for the conceptualisations of meanings and values in housework is inappropriate. As environmental features shape how people feel and think about what they do and reflect a complex interplay of motives, habits, roles and abilities within the environment (Kielhofner, Forsyth, Kramer, Melton, & Dobson, 2009), people who live in different socio-cultural environments will perceive housework very differently. This will directly affect how housework is carried out at home.

Gender ideology is an important factor in the dynamics of housework distribution at home. The national context, including employment policy and the welfare system, has a major influence on the character of gender ideology in housework. In a study carried out by Hook (2010) that incorporated 36 time use surveys across 19 countries, spanning five decades from 1965 to 2003, and focusing on married men and women with children, national conditions such as work hours and parental leave affected both men and women's decisions on how housework was performed in the home. One of the effects of the national context on housework distribution could be its influence on gender equality. A recent study based on data from the International Social Survey Program (Knudsen & Waerness, 2008), found that couples in countries with the highest levels of gender equality also experienced a more equal distribution of housework (Knudsen & Waerness, 2008).

In a review on the symbolic properties of household tasks, Klocokova (2004) not only agreed that housework meanings are related to the social and cultural environment, and are thus culturally relative, he also suggested they differ among families. As such, although the national context plays an important role in the socio-cultural context of housework, within the same country, differences among families in



terms of ethnicity, women's personal income and family structure can also lead to differences in how housework is perceived by women and how it is carried out at home. In a study by Sayer and Fine (2011), based on American Time Use Survey from 2003 to 2007, focusing on caucasian, African, Hispanic and Asian populations, although women with higher incomes spent less time on housework, larger differences were observed for Hispanic women compared to other groups.

In terms of family structure, studies have already suggested a higher risk of musculoskeletal problems associated in women with young children could be due to the amount of time these women spent on housework as a result of taking care of their children at home (Bjorksten et al., 2001). A study by Zabel and Heintz-Martin (2012), who used the Generations and Gender Survey coordinated by the United Nations Economic Commission for Europe, confirmed this. Their study found that in West Germany, compared to childless couples, a much wider gender gap in housework distribution was observed in married couples with pre-school age children (Zabel & Heintz-Martin, 2012). The study also found a more equal distribution of housework when the couples had older children (more than 18 years old) (Zabel & Heintz-Martin, 2012). Differences were observed not only among families with children, but also among families without children. In a study by South and Spitze (1994) on housework in a US population of married and unmarried couples, using the National Survey of Families and Households (NSFH). the gender gap in housework distribution was wider for married than unmarried couples.

Apart from differences across countries and families, the context of housework could also change across generations, through parental differences. A woman's employment status could alter with a change in her life course. As mentioned, the study by Zabel and Heintz-Martin (2012) found that in West Germany, women with older

children had higher employment rates than those with younger children. A change in the mother's employment is an important predictor of housework allocation for their daughters (Cunningham, 2001; Manke, Seery, Crouter, & McHale, 1994). As such, generational differences in women's participation in housework are expected due to the much higher employment rates among mothers in contemporary society compared to the past. As women's employment rates increase, women's values and priorities could also change. In some socio-cultural environments, a focus on paid work and education could encourage an emphasis on children's education rather than engaging them in housework participation. A study by Goh and Kuczynski (2012) on 19 Chinese families found that children's housework participation was generally low compared to their parents or grandparents. Based on previous research on identity development (Kroger & Green, 1996; Waterman, 1982), the development of women's perceptions in housework-related meanings through childhood, adolescence and adulthood form the development of their role identities in these stages. These role identities are then organised into a system that represents the woman's self (Stryker, 1968; Stryker & Serpe, 1994). When women participated in less housework when they were young, it was very likely they would perceive housework very differently from their mothers.

There is a strong socio-cultural dimension to housework that affects the patterns of housework distribution at home. This is confirmed in an extensive review by Coltrane (2000) on 200 scholarly articles and books published between 1989 and 1999. Coltrane found that socio-cultural factors such as men's and women's income, gender ideology and life course issues were consistent predictors of housework distribution in families.

#### **2.5.4 Risk of upper limb RSI in housework.**

With women's major participation in housework, the risk of upper limb RSI increases. A cross-sectional survey using a convenience sample of 126 female homemakers from the Hong Kong Federation Women's Centre, and from a street in one of the oldest urban districts in Hong Kong (age range from 20 to >60 years old), found that 63 (29.2%) of the respondents were in paid work; 153 (70.8%) were full time homemakers (Fong & Law, 2008). Using a standardised Nordic Questionnaire in the study, they found that more than 60 per cent of participants had experienced at least one musculoskeletal symptom in the past 12 months (Fong & Law, 2008). Consistent with this finding is another study on 435 women from Nabaa in Lebanon. The women in this study were of a similar age range (from 18 to 62 years old) and employment distribution, with 23.9% in paid jobs, and 73.1 % full time homemakers (R. R. Habib et al., 2011). This study found that 77 per cent of these women had reported musculoskeletal symptoms in the past 12 months (R. R. Habib et al., 2011). These two studies, involving women with a similar percentage distribution in paid work and full time housework duties, found similar results and agreed on the high prevalence rate of RSI in women who performed housework. However, these studies also included a percentage of women in paid work.

When a similar research methodology was used on a group of full time homemakers, excluding women in paid work, R. R. Habib et al. (2006) found that the prevalence rate dropped significantly. In their study on 1,266 married women—all full time homemakers in three communities on the outskirts of Beirut, Lebanon—they found the prevalence of MSDs was only 19 per cent (R. R. Habib et al., 2006). One possible reason for the higher prevalence rate of MSDs among a group of women including both employed women and full time homemakers could be explained by the

higher total workload (paid and unpaid) of women in paid work. A cross-sectional survey of 61 workers in a manufacturing company in the middle of Sweden, which found that a higher proportion of women than men reported shoulder problems, also found that women in their study spent more time on household activities (Dahlberg et al., 2004). This is consistent with the findings of a Korean study on 950 female bank tellers. The study found that daily time spent on housework was one factor associated with the presence of WRMSD symptoms (Yun, Lee, Eoh, & Lim, 2001).

When women spend more time on housework, they will naturally spend less time on leisure activities. This could be associated with the occurrence of RSI. In a study of 737 Australian public service employees, 73 per cent of them women, 83 per cent of the women reported upper body symptoms, compared to 77 per cent of men reporting the same (Strazdins & Bammer, 2004). The same study noted that women reported significantly less time to exercise and relax compared to men, due to their greater participation in parenthood and domestic work. These are the interlinking factors that explain gender differences in musculoskeletal disorders (Strazdins & Bammer, 2004). These findings are supported by a cross-sectional survey on 651 workers of various occupations in Portugal (Monteiro, Alexandre, & Rodrigues, 2006). This study determined that the occurrence of musculoskeletal diseases was associated with long housework hours and absence of leisure activities (Monteiro et al., 2006).

Although several studies supported the significant role of housework in the aetiology of RSI and upper limb RSI among women, more specific studies relating to housework and RSI are necessary. R. R. Habib, Fadi A, and Messing (2010) reviewed 56 articles and compared the findings with their observations of four homes in Beirut, Lebanon. They concluded that 'housework activities expose homemakers to known risk factors for MSDs (R. R. Habib et al., 2010, p. 113). However, out of the 56 articles

reviewed, they also found that only 12 reported specific findings relating musculoskeletal problems or pain to those who do housework (R. R. Habib et al., 2010). This indicates the need for more research.

#### **2.5.5 Specific risk factors of upper limb RSI related to housework activities.**

Although only a limited number of studies could be found on the specific risk factors involved in housework related to upper limb RSI, the results of these studies provide useful evidence to support ergonomic education on housework as an important part of the overall management of upper limb RSI for women. A survey on 1,000 families in Italy with a response rate of 31.7% found that upper limb disorders are associated with housework tasks such as washing dishes, cleaning carpets and cleaning clothes (Rosano et al., 2004a).

The use of surveys such as those described above is common in RSI research. Only a limited number of studies were found that involved more objective measures such as ergonomic site evaluations or biomechanical risk analysis in housework tasks. To date, only two studies employing such a methodology could be found. One study analysed biomechanical risks in nine housework tasks using video recording of 12 participants among the 104 participants who participated in the Italian survey (Apostoli et al., 2012; Sala et al., 2007). According to this study, although all tasks were found to impose biomechanical risk when performed for four hours a day, higher overloads were detected specifically in ironing, cleaning floors and cleaning kitchen bench tops (Sala et al., 2007).

In another study with 943 full time housewives in Hong Kong (Yip & Hung, 2002), the presence of musculoskeletal symptoms reported by 84 per cent of the 794 survey respondents was associated with risk factors such as psychological status, awkward posture and prolonged duration of housework (Yip & Hung, 2002). These

results were reported as consistent with onsite ergonomic evaluations of three patients with tennis elbow (Yip & Hung, 2002). Although the study by Yip and Hung (2002) did not specify the housework tasks being analysed in their ergonomic site evaluations, it is probably safe to assume that they could differ from the other two studies in Italy due to cultural and climate differences. For example, as carpet is not common flooring in Hong Kong, carpet cleaning most likely would not have been analysed within their small sample size of three patients. Despite the possible socio-cultural differences in the environments in which these studies were conducted, there is support that excessive biomechanical load related to repetitiveness of movements, awkward postures and duration of housework tasks is the main biomechanical risk factor for upper limb RSI in housework, consistent with those identified in paid work.

#### **2.5.6 Summary—prevalence and risk of upper limb RSI in women.**

More women than men suffer from upper limb RSI. An examination of these studies suggests that women's major participation in housework is one reason for the higher prevalence rate. Recent evidence was found to provide support for three statements that serve to qualify this suggestion. First, women are doing more housework than men. Second, risk of upper limb RSI exists among women who need to do housework. Third, there are specific risk factors of upper limb RSI related to housework.

## **2.6 Management of Upper Limb RSI**

Management of upper limb RSI can be categorised under surgical and non-surgical treatment. A search of the articles for each diagnosis revealed that although these conditions share certain similarities in their treatment, each diagnosis involves different procedures in their surgical management, medical treatment, splinting and physical modalities. Using carpal tunnel syndrome (CTS) and lateral epicondylitis of

the elbow as examples, although a keyword search of these two conditions generated articles that could be categorised into surgery, injections, splinting and physical modalities, the procedures involved for each category were very different for the two diagnoses. Using surgery as an example. For CTS, common surgical procedures include endoscopic carpal tunnel release, open carpal tunnel release, and carpal tunnel decompression (Huisstede et al., 2010). For lateral epicondylitis (commonly known as ‘tennis elbow’), common surgical treatment includes open extensor carpi radialis brevis (ECRB) release, percutaneous ECRB tenotomy, radiofrequency microtenotomy, posterior interosseous nerve (PIN) decompression, and extracorporeal shock wave therapy ESWT (Buchbinder et al., 2011). As such, research on these interventions is often carried out on a specific diagnosis instead of upper limb RSI as a cluster.

### **2.6.1 Ergonomic interventions for people with upper limb RSI.**

According to the official website of the International Ergonomics Association (2000), ergonomic intervention is the planning, design and evaluation of tasks, jobs, products, organisations, environments and systems so as to match these with the needs, abilities and limitations of people. This definition implicates the multiple components that need to be involved in ergonomic interventions, and the variations that need to be considered to match the needs of different people. As such, there are multiple ways to categorise these interventions.

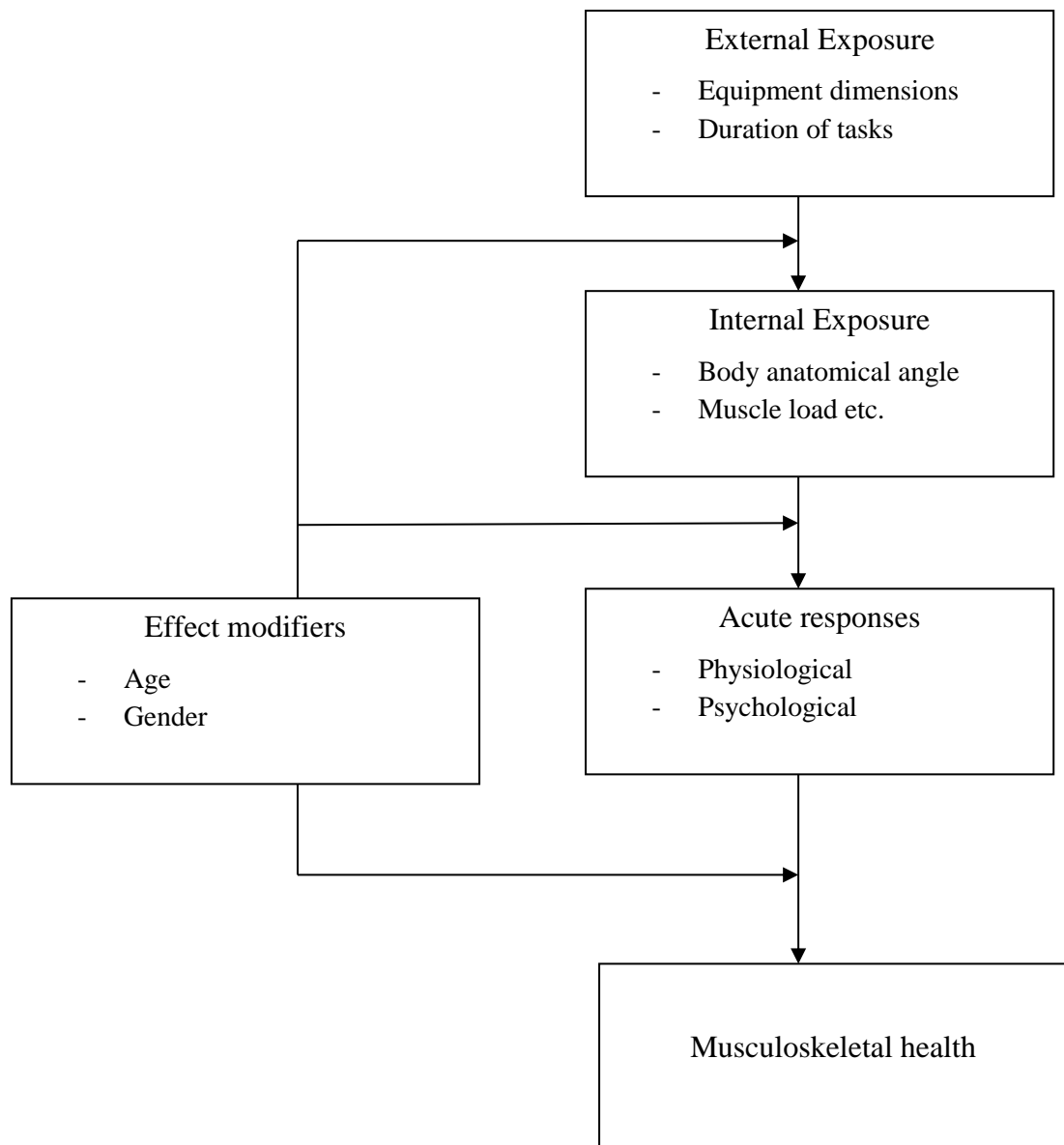
Ergonomic intervention for the management and prevention of upper limb RSI can be categorised in two ways (Boocock et al., 2007). First, they can be classified (in terms of the purpose and target population of the interventions) into three levels: primary, secondary and tertiary interventions (The Institute of Medicine of National Research Council, 2001). According to a document published on a Canadian website managed by the Institute of Work and Health (2006), primary intervention is mainly

concerned with preventing healthy people from developing the disease, while secondary and tertiary intervention is concerned with the secondary prevention of re-injuries for people who have already been affected by the conditions, or who have developed disabilities as a result of the conditions. For people with upper limb RSI, the primary goal of ergonomic interventions will be both primary prevention of new injuries and secondary prevention of re-injuries.

Second, ergonomic interventions can be classified according to the types of intervention components (Boocock et al., 2007). Based on a model of the relationship between physical workload and musculoskeletal health developed by Westgaard and Winkel (1996) (see Figure 2.1), Boocock et al. (2007) suggested three main types of intervention components: mechanical exposure interventions; production systems and organisational culture interventions; and modifier interventions. As suggested by the model, external exposures such as equipment dimensions and duration of tasks affect a worker's internal exposures, including body anatomical angle and muscle load. In turn, these cause physiological and psychological responses in the body and ultimately affect the individual's musculoskeletal health (Westgaard & Winkel, 1996). The model also suggested that effect modifiers such as age and gender exert an influence at each stage (Westgaard & Winkel, 1996). As such, mechanical exposure interventions, as well as production systems and organisational culture interventions, could be used to manage external exposures. This could reduce the effect on internal exposures, hence improving an individual's musculoskeletal health. Examples of these interventions could include modification of work stations or production work flows (Boocock et al., 2007) to reduce muscle loads on people during activities. Similarly, modifier interventions could be used to manage capabilities and limitations specific to certain effect modifiers, such as age and gender, reducing the effect of external exposures on internal exposures. This



could improve the musculoskeletal health of an individual. Examples include: exercises to improve strength, flexibility and coordination; and ergonomics education, or training on ergonomic practices to facilitate a behaviour change to prevent upper limb RSI (Boocock et al., 2007).



*Figure 2.1.* A model of relationship between physical workload and musculoskeletal health (adapted from Westgaard & Winkel, 1996, with permission).

### **2.6.2 Evidence on ergonomic interventions.**

Many studies on ergonomic interventions targeted upper limb RSI as a cluster (rather than an individual diagnosis within the group), and on office workers who used computers or visual display terminals (VDTs). Thirty one studies, published between 1999 and 2012, were identified to conduct a literature review on ergonomic interventions for this group of workers. The studies were first categorised according to intervention levels, based on the intervention examples suggested by Boocock et al. (2007). They were then reviewed according to the relationships in Westgaard and Winkel (1996) model (e.g. mechanical exposure on internal exposure) (see Figure 2.1). Criteria to classify studies in terms of intervention levels, intervention components and outcome are presented in Table 2.3. The effect of various intervention components was examined according to the model (Westgaard & Winkel, 1996) and evidence from these studies was then presented according to their levels of interventions (primary, secondary and tertiary intervention).

Out of 31 studies, three studies were categorised and discussed in a separate section as they specifically focus on health behaviour changes. At the end of this section, a summary of the evidence is presented. The results of these studies are also compared with recent reviews.

Table 2.3

*Criteria for Categorisation of Studies*

<b>Intervention levels</b>	<b>Criteria</b>
Primary intervention	Studies that focus on healthy office workers not diagnosed with upper limb RSI, with or without musculoskeletal pain in body parts
Secondary and/tertiary intervention	Studies which focus on symptomatic office workers diagnosed with upper limb RSI
<b>Components of intervention</b>	<b>Criteria</b>
Mechanical exposure intervention	Studies with programme component that aims to reduce mechanical exposure of an activity through the provision of hardware (equipment, furniture etc.) or recommendations on workspace design
Modifier intervention—ergonomics education/training	Studies with programme component which aims to facilitate the use of ergonomics practices in an activity through education/training on ergonomics practices with or without an ergonomics equipment or device
Modifier intervention—therapy or exercises programme	Studies with programme component which aims to improve level of physical activity, strength, flexibility and coordination, or therapy program to facilitate recovery process
<b>Outcome categories</b>	<b>Criteria</b>
Internal exposure (IE)	Studies with outcome measures of muscle activity and postures during activities
Musculoskeletal health (MH)	Studies with outcome measures of symptom severity, productivity, and functional status, incidence rate of upper limb RSIs or self-perceived quality of life

### ***2.6.2.1 Primary intervention.***

Only studies with initial samples involving healthy office workers and excluding people diagnosed with upper limb RSI were examined under this category. Presence of musculoskeletal pain in body parts does not necessarily mean there is an occurrence of upper limb RSI. As such, although some studies presented in this category have an initial sample that includes workers with musculoskeletal pain, without the use of any diagnostic criteria, they are still categorised as primary interventions.

Twenty one studies investigated primary ergonomic interventions for office workers who use computers or VDTs. Nine reported intervention effects on internal exposure, such as muscle activity or postures (Appendices One and Two). Twelve reported findings on musculoskeletal health (Appendices Three and Four).

#### *2.6.2.1.1 Effect on internal exposure.*

Out of nine studies that investigated intervention effects on internal exposure, five studies explored mainly the effect of mechanical exposure interventions on internal exposure of individuals (see Appendix One). All five studies found that changes in workstation configurations or equipment design lead to changes in muscle activity or posture in the individuals' upper limbs during computer work (Delisle, Larivière, Plamondon, & Imbeau, 2006; Dumas et al., 2008; Kotani, Barrero, Lee, & Dennerlein, 2007; van Galen, Liesker, & de Haan, 2007; Zecevic, Miller, & Harburn, 2000). However, none of these studies explored the effects of ergonomics education or training.

The effects of ergonomics education or training were explored in four studies (see Appendix Two). Three of these studies confirmed the positive effects of ergonomic education and training on work postures (internal exposure) (Marcoux, Krause, & Nieuwenhuijsen, 2000; Mirmohammadi, Mehrparvar, Olia, & Mirmohammadi, 2012;

Taieb-Maimon, Cwikel, Shapira, & Orenstein, 2012). One study that explored specifically the modifying effect of ergonomic education or training on the relationship between mechanical exposure intervention and internal exposure (Houwink, Oude Hengel, Odell, & Dennerlein, 2009) also confirmed the positive benefits.

A review of these nine studies shows consistent evidence indicating the positive effects of mechanical exposure interventions on internal exposure, such as upper limb postures and muscle activity in computer workers. There is also evidence to indicate that ergonomic education and training can enhance the effects of mechanical exposure interventions on internal exposure for this group of workers. However, comparison of the results is impossible as the training methods, format, time frame and other details of the programmes in these studies were all different.

#### *2.6.2.1.2 Effect on musculoskeletal health.*

Twelve studies investigated the effect of multi-component interventions, including both mechanical exposure and modifier components, on the musculoskeletal health of this population group. The measures for musculoskeletal health used in these studies varied. Some measured changes in severity of symptoms and frequency of symptoms; others measured changes in musculoskeletal pain, quality of life or incidence rate of upper limb RSI in the population.

Out of these twelve studies, six used a pre-post intervention design without any comparison groups (see Appendix Three). Although these six studies provide consistent evidence indicating the effectiveness of a multi-component intervention on internal exposure and musculoskeletal health, none of these studies include a comparison group (Aaras et al., 2005; Dainoff, Cohen, & Dainoff, 2005; Goodman et al., 2005; Konarska et al., 2005; Lewis, Fogleman, Deeb, Crandall, & Agopsowicz, 2001; Street, Kramer, Harburn, Hansen, & MacDermid, 2003). This not only compromises the strength of the

evidence but also makes it impossible to investigate the modifying effects of ergonomic education or training.

Six of the twelve studies included comparison groups (see Appendix Four). Three of these studies compared an intervention group to a control group with no intervention (Choobineh, Motamedzade, Kazemi, Moghimbeigi, & Heidari Pahlavian, 2011; Greene, DeJoy, & Olejnik, 2005; Mahmud, Kenny, Zein, & Hassan, 2011). Although these three studies provide some evidence supporting the positive effects of a multi-component intervention, they did not focus on investigating the modifying effects of ergonomic education and training in interventions. They also did not demonstrate that multi-component intervention is superior to a single component intervention. However, this is demonstrated by evidence from the other three studies (Laestadius et al., 2009; Rempel et al., 2006; Robertson, Huang, O'Neill, & Schleifer, 2008). These studies not only demonstrate the modifying effects of ergonomics education and training, they also indicate the importance of combining multi-components in ergonomic interventions.

Although evidence from these twelve studies supports the use of multi-component ergonomic interventions for these workers, not all of them provide evidence to support the relationship between internal exposure and musculoskeletal health. Out of twelve studies, only two (Aaras et al., 2005; Laestadius et al., 2009) provide evidence for this relationship. The study by Aaras et al. (2005) found an association between reduction in trapezius load and reduction in shoulder pain. The study by Laestadius et al. (2009) found an association between improvement in postures and less musculoskeletal pain.

Due to the different intervention content and formats used in these twelve primary intervention studies, there is consistent evidence to support the positive effect of multi-component interventions on both internal exposure and the musculoskeletal health of these workers. Although only two studies explored the relationship between internal

exposure and musculoskeletal health, findings from both studies demonstrate an association.

#### ***2.6.2.2 Secondary and tertiary intervention.***

Studies with clear inclusion criteria including only symptomatic workers with upper limb RSI were examined in this category. Five studies investigated secondary and tertiary interventions for computer workers with upper limb RSI. All reported findings of intervention effects on musculoskeletal health. Measurements of functional status, symptom severity and productivity were used to determine the status of improvement in musculoskeletal health of these workers.

Out of these five studies, two investigated the effects of mechanical exposure intervention on musculoskeletal health with the same cohort (see Appendix Five) and three used interventions considered as multi-component (see Appendix Six). Results from these studies show consistent evidence supporting the positive effects of multi-component ergonomic interventions on musculoskeletal health for office workers with upper limb RSI (Bleecker et al., 2011; Omer et al., 2003; Povlsen, 2012; Ripat et al., 2010; Ripat et al., 2006)..

#### ***2.6.2.3 Combination of primary, secondary or tertiary intervention.***

Two studies with a combination of intervention levels were found (see Appendix Seven). A study conducted on all employees in Johns Hopkins Hospital and University found that medical management with an ergonomics intervention program, which involves both mechanical exposure intervention and modifier intervention in the form of ergonomics education and training, was effective in the primary, secondary and tertiary prevention of UEMDs (Bernacki, Guidera, Schaefer, Lavin, & Tsai, 1999). This study found a statistically significant decrease (80%) in the rate of upper limb RSIs, over a seven-year period.



Another study, which compares two intervention groups with one control group, also found positive results (Soares et al., 2012). In this study, both intervention groups with ergonomic education and training resulted in a significant reduction in pain and improvement in postures after intervention, compared to the control group. They were found to be effective in the primary and secondary prevention of upper limb RSI. In summary, the results from these two studies provide consistent evidence to support the findings of other studies reviewed in this section.

#### ***2.6.2.4 Studies on health behaviour change.***

Among all the studies related to ergonomic interventions for office workers examined in this section, only three focus specifically on health behaviour change (see Table 2.4). The study of primary intervention by Nieuwenhuijsen (2004) found that perceived health status, self-efficacy and intention to change are most strongly related to behaviour change for office workers.

Although there are many theories of behaviour change, research on its use in ergonomic intervention is still lacking. Only two studies of secondary intervention level with the same cohort have investigated the effect of a theory-based intervention on behaviour change (Bernaards, Ariens, Knol, & Hildebrandt, 2007; Bernaards, Ariens, Simons, Knol, & Hildebrandt, 2008). Both studies found that an ergonomic intervention developed with concepts from the transtheoretical model (TTM) and precaution adoption process model (PAPM), stage theories of behaviour change, was effective in facilitating health behaviour change and reducing pain among office workers with neck and upper limb symptoms.

Table 2.4

*Studies on Health Behaviour Change*

<b>Authors and Year</b>	<b>Study aim</b>	<b>Sample</b>	<b>Results</b>
Nieuwenhuijsen (2004)	To investigate the effect of a multi-component intervention on health behaviour change among computer workers to prevent RSI.	N=40 (M=9, F=31).	Perceived health status and self-efficacy has a significant effect on health behaviour change with a self-reported survey validated by experts.
(Bernaards et al., 2007)	To compare the effectiveness of a single intervention targeting behaviour change in work style and a combined intervention targeting behaviour change in work style and physical activity on recovery from neck and upper limb symptoms.	N=152 work style (WS) group. N=156 Work style and Physical Activity (WSPA) group. N= 158 usual care	Randomisation method used. No significant difference in physical activity between groups. Significant reduction in pain for WS group at 12 months ( $p<.05$ ) but not at 6 months. No significant reduction in pain for WSPA group.
(Bernaards et al., 2008)	To investigate the effectiveness of a group based interactive WS intervention to improve WS behaviour for computer workers with neck and upper limb symptoms.	N=152 WS group. N=156 WSPA group. N= 158 usual care.	Randomisation method used. Significant improvement in work style behaviour in WS and WSPA group compared to Usual care group ( $p<.05$ ).

#### *2.6.2.5 A summary of evidence on ergonomic interventions for office workers.*

Based on the review of the above studies, consistent evidence exists supporting the positive effects of mechanical exposure intervention or modifier intervention (ergonomic education or exercises) at all intervention levels (primary, secondary and tertiary) on both internal exposure and musculoskeletal health. There is also evidence showing the association between internal exposure and musculoskeletal health. Evidence from these findings provide support for the model by Westgaard and Winkel (1996), which indicates the importance of incorporating multiple components in an ergonomic intervention for this group of workers.

According to recent systematic reviews, evidence on the positive effects of ergonomic interventions ranged from minor to moderate evidence only (Boocock et al., 2007; Goodman et al., 2012; Hoe, Urquhart, Kelsall, & Sim, 2012; Verhagen et al., 2006). The main reason for the lack of strong evidence for a specific intervention is the heterogeneity of interventions used in various studies, which compromise the comparability of results from these studies through meta-analysis. The issue of heterogeneity in ergonomic interventions and outcome measures used was also observed in the present review.

For mechanical exposure intervention and modifier intervention to be effective, health behaviour change has to happen before internal exposure can be reduced and musculoskeletal health improved. Despite consistent evidence from the reviewed studies to support interventions based on the model of relationship between physical exposure and musculoskeletal health by Westgaard and Winkel (1996), most neglect to investigate the factors for health behaviour change towards ergonomic practices. Also, limited research was found that focused on the effects of ergonomic education in facilitating these health behaviour changes for this group of workers.

### **2.6.3 Ergonomic interventions on housework for women with upper limb RSI.**

Housework is often referred to as unpaid work at home and it involves tasks that are very different from office work. As such, it should require a different set of knowledge and skills taught during ergonomic interventions, ones that are specific to the tasks involved. Unfortunately, studies in this area were very limited.

Some earlier efforts in ergonomic interventions to avoid RSI related to housework are reflected in a commentary by Appelbe (1957), on an educational booklet *Housework at ease* and an article on ergonomic factors in kitchen design (Ward, 1974). Grandjean (1979) also suggested the importance of expanding ergonomics from vocational activities at workplaces to non-vocational activities at home.

When I conducted a search to retrieve more recent studies or reviews on ergonomic interventions related to housework, only a few studies could be found. Some studies focus on the identification of risk in housework and advocating the necessity of ergonomic interventions within an occupational therapy context (Maynard & Blain, 2005; Sanders & Morse, 2005). Others focus on exploring the physical demands of various housework tasks with the use of gadgets (Norman et al., 2003; Sandhu, 2003). However, none could be found on ergonomic interventions focusing on facilitating a behaviour change in housework for women with upper limb RSI.

### **2.6.4 A Summary—management of upper limb RSI.**

Although research on the management of upper limb RSI in terms of medical treatment and surgical procedures was usually based on a specific diagnosis, much research exists on ergonomic interventions targetting upper limb RSI as a cluster. Most research on ergonomic interventions was related to office workers who work with VDTs. Reviews of studies for this group of workers reveal consistent evidence to

support the hypothesis that mechanical exposure reduction will lead to a reduction in internal exposures, hence improving musculoskeletal health. There is also consistent evidence on the positive modifying effects of ergonomics training and education, and exercise programmes on the various intervention outcomes. This indicates the importance of involving multiple components in ergonomic interventions. Although behaviour change is essential in ergonomic intervention for improvements in musculoskeletal health, there is limited research in this area. Most research fails to explore the factors that lead to behaviour change for this group of people.

For women with upper limb RSI, research on ergonomics intervention is even more limited. No research was found that focused on ergonomic education targeting behaviour change in housework for women with upper limb RSI.

## **2.7 Addressing the Gap: Research Direction in Occupational Therapy**

In this section, I will examine the role of occupational therapy for women with upper limb RSI by drawing inferences from the definitions and scope of practice as stated by the profession. Drawing on a summary of the literature reviewed in the earlier sections of this chapter, the central philosophy of occupational therapy and the importance of making tacit knowledge in therapists' clinical reasoning process explicit, I will then introduce four research questions. These research questions will be addressed within this thesis and the answers to these questions will help to better understand the optimal approach to plan and conduct an effective ergonomic education on housework for women with upper limb RSI.

### **2.7.1 Occupational therapy practice and women with upper limb RSI.**

Occupational therapy is a client-centred health profession concerned with promoting health and wellbeing through occupation. The primary goal of occupational therapy is to enable people to participate in the activities of everyday life. OTs achieve

this outcome by working with people and communities to enhance their ability to engage in the occupations they want to, need to, or are expected to do, or by modifying the occupation or the environment to better support their occupational engagement’ (World Federation of Occupational Therapists, 2010, p. 1).

Although this definition does not specify the client groups that OT serve, it implies both their diversity and also the central philosophy of occupational therapy. In another definition of occupational therapy, the diversity of clients can be appreciated through this statement:

Occupational Therapy addresses the physical, cognitive, psychosocial, sensory, and other aspects of performance in a variety of contexts to support engagement in everyday life activities that affect health, wellbeing, and quality of life ... (American Occupational Therapy Association, 2004, p. 2).

Indeed, occupational therapy addresses diverse clients across different ages and cultures experiencing a wide range of conditions that affect their engagement in daily activities.

Applying these definitions to people with upper limb RSI, one aspect of occupational therapy practice is to promote health by supporting their engagement in daily activities, both paid and unpaid. However, there is very limited occupational therapy research in this area specifically focused on this population group. According to a recent systematic review of 36 studies on occupational therapy interventions for people with work-related injuries and conditions of the upper limbs, all interventions, including ergonomic interventions, still required further investigation. (Amini, 2011).

According to the American Occupational Therapy Association, one aspect of occupational therapy practice includes the use of ‘interventions and procedures to promote or enhance safety and performance in activities of daily living (ADL)’

(American Occupational Therapy Association, 2004, p. 6). Two stated themes are: the ‘education and training of individual’ and ‘modification of environment (home, work, school, or community) and adaptation of processes, including the application of ergonomic principles’ (American Occupational Therapy Association, 2004, p. 6). Also, as Berger (2009) states, OTs are educators who teach clients knowledge and skills for health and wellbeing. She uses the term ‘client education’ to describe this process: it is not limited to patients in hospitals but also their families, caregivers and even other professionals, such as teachers. Applying these statements to women with upper limb RSI, an important aspect of occupational therapy practice would be the planning and implementation of an ergonomic education programme to facilitate behaviour change in housework to prevent re-injuries.

### **2.7.2 Theory-based interventions vs. non-theory-based interventions.**

Planning of an intervention can either be based on an explicit theory or a therapist’s clinical experience and tacit knowledge. There are at least two possible advantages in using theory to plan interventions for the facilitation of health behaviour change. First, theory-based interventions might be more effective than non-theory-based interventions. According to Brewer and Rimer (2008), who compared reviews and meta-analyses on the use of theories on health behaviours such as condom and mammography use, there was at least modest support for the improved effectiveness of theory-based interventions compared to interventions based on clinical experience and tacit knowledge only.

Another advantage of using theory to guide interventions for health behaviour change is its ability to facilitate OTs’ clinical reasoning processes, especially when they are new to a specific intervention. Based on the professional conceptualisation in the model of skill acquisition by Dreyfus and Dreyfus (1986) and its application in

occupational therapy (Slater & Cohn, 1991), Schell (2009) has summarised the expertise continuum in occupational therapy into five levels according to the years of experience in reflective practice. These are: novice (0 years), advanced beginner (<1 year), competent (3 years), proficient (5 years) and expert (10 years). Reflective practice refers to the critical way that a therapist reflects upon his or her therapy actions both during and after therapy, and who view these opportunities as a way to learn (Kinsella, 2001b). Schell (2009) indicated that novice therapists use narrative reasoning, through listening to their clients' stories, to establish relationships with their clients. They would start to gain skills when they proceeded to the level of an advanced beginner. However, Schell (2009) also indicated it was only when therapists proceed to a proficient level that they would become more attentive to their clients' occupational stories and their relevance for intervention. According to a study by Slater and Cohn (1991), who conducted interviews with seven expert and seven novice OTs in Boston, US, while novice OTs relied on rules to guide their practice, experienced therapists' clinical reasoning processes were mainly intuitive, based on tacit knowledge.

One might then expect that a model or protocol with well-defined domains and constructs would facilitate OTs' clinical reasoning processes if they were yet to reach the level of 'proficient' or 'expert' on the continuum. This is confirmed by a recent study, which found that after novice therapists were exposed to working with a domain-specific clinical reasoning protocol, their clinical reasoning (as measured by repertory grid interviews) became closer to that of expert therapists (Kuipers & Grice, 2009). This suggested the importance of a theoretical practice perspective in intervention, especially for therapists with less than five years clinical experience.

There are many studies on theory-based interventions for various health behaviours. In a systematic review of 193 health behaviour research articles published



in 19 peer reviewed journals from the period 2000 to 2005 (Painter, Borba, Hynes, Mays, & Glanz, 2008), the most frequently studied behaviours included tobacco use, physical activity, alcohol use, nutrition and disease screening. Of these articles, 69 (35.7%) used theory to guide intervention. According to the same review, the most commonly used theories are the Transtheoretical Model/Stages of Change (TTM) (27.5%) and the Social Cognitive Theory (27.5%), followed by the Health Belief Model (20%) (Painter et al., 2008).

Social Cognitive Theory was developed by Bandura (2001) and it puts a great emphasis on the central role of self-efficacy in behaviour change. According to this theory, self-efficacy is constructed from four sources: the experiences when one tries to start a behaviour change, the experiences when one tries to model the behaviour change of another, verbal persuasion from a significant other, as well as the physiological/affective experiences with the change (Bandura, 2001). Compared to the Social Cognitive Theory, Health Belief Model was developed much earlier by Rosenstock (1974). According to this model, behaviour change is dependent on three intrinsic factors and one extrinsic factor (Rosenstock, 1974). While the three intrinsic factors refer to the person's perceived threat of the disease that a change of behaviour is needed to protect against, his/her perceived effectiveness of the behaviour in preventing or managing the disease and the general health motivation, the extrinsic factor refers to the cues to action (e.g. warnings on cigarette packages) (Rosenstock, 1974). Different from Social Cognitive Theory, self-efficacy is not a central component to the Health Belief Model, and is only added when the model is used to predict long term behaviour perseverance (Garcia & Mann, 2003). While both Social Cognitive Theory and Health Belief Model doesn't have a temporal dimension, and is commonly categorized as

continuum models according to Schwarzer (2008), (TTM) is a stage change model that includes a temporal dimension.

The TTM was developed by Prochaska and Di Clemente (1982) from a comparative analysis of 18 leading therapeutic systems in psychotherapy. It was initially tested on a population of 827 people, who went through the process of changing their smoking habits on their own. In the TTM, six stages of change were identified: precontemplation, contemplation, preparation, action, maintenance and termination. The TTM was widely accepted and researched in the evaluation of readiness to change among people with chronic pain (Kerns & Rosenberg, 2000; Kerns, Rosenberg, Jamison, Caudill, & Haythornthwaite, 1997; Kerns, Wagner, Rosenberg, Haythornthwaite, & Caudill-Slosberg, 2005; Nielson, Armstrong, Jensen, & Kerns, 2009). Although chronic pain is a common experience among women with upper limb RSI, no research was found on the use of the TTM or any other health behaviour theories on ergonomic education in housework for women with upper limb RSI.

As suggested by Fleming (1994, p. 24), 'while tacit knowledge contributes to the expertise of the individual, it does not contribute to the collective knowledge of the profession'. By making tacit knowledge explicit in the form of a theory or a model, not only can researchers formulate clear evaluation questions (Grembowski, 2001) to ascertain intervention outcomes, their clinical reasoning processes can also be improved. As such, for women with upper limb RSI in Singapore, planning an ergonomic education programme on housework should be based on a model. Constructing a model of behaviour change in housework will provide a basis for therapists to develop effective ergonomic education on housework for this group of women.

### **2.7.3 Client-centred approach in occupational therapy.**

Client-centred approach is the central philosophy of occupational therapy. A lot of research has been done on client centred approach care. In a study by Stewart et al. (2000) with 39 family physicians and their 315 patients with a mixture of complaints that are digestive, musculoskeletal, respiratory and skin related, it was reported that patient centred communication was associated with better emotional health and physical recovery from their discomfort. In terms of rehabilitation, a retrospective study with the audit of 27 patients with Acquired Brain Injury (ABI) who are successfully placed in employment, there was evidence of client centred approach in all files audited (O'Brien, 2007). This indicates the possible positive effects of client centred approach for this group of clients in terms of vocational placement. Although there is the question of a small sample size in the study by O'Brien (2007), their results are confirmed by another study with a bigger sample size of 154 participants with ABI. The study found that the achievement of short term client-centred goals is associated with greater levels of vocational and residential independency and it was also found that outcome was maintained at 1 year follow-up (Bergquist et al., 2012).

Despite the positive evidence of client-centred approach suggested by these studies, none of these studies involve the comparison of groups. In a study by Wressle, Eeg-Olofsson, Marcusson, and Henriksson (2002) who compared two groups of patients with a mixture of diagnosis (stroke, orthopaedics, cardiopulmonary and internal medicine related), they found that the experimental group (n=155) achieved significantly higher client participation in the rehabilitation process with the use of Canadian Occupational Performance Measure (COPM), as compared to the control group (n=55). COPM is a validated assessment tool that can be used during the rehabilitation process to identify therapy goals which can also be used as an outcome

measure of intervention (Dedding, Cardol, Eyssen, Dekker, & Beelen, 2004). However, the main issue with the study by (Wressle et al., 2002) was the lack of proper randomization method in group allocation.

Most randomized controlled trials were carried out with clients after stroke. In a feasibility study by Guidetti and Ytterberg (2011) that explored the effectiveness of a client-centred self-care intervention program, it was found that a higher percentage of clients (80%) in the experimental group (n=10) achieved clinically important improvements than the control group (80% of n=14). As it is a feasibility study with small sample size, the results can not be considered as representative. In another pilot study which investigated the effectiveness of a client centred occupation based neurofunctional treatment, the authors demonstrated the significant improvement in occupational performance and satisfaction among stroke survivors following the client centred intervention with a different research methodology. First they compared the treatment outcome of two groups at 12 weeks: experimental group which received client centred intervention (n=12) and control group (n=13) which received standard treatment, and found significant improvement in the experimental group but not in the control group (Rotenberg-Shpigelman, Erez, Nahaloni, & Maeir, 2012)(Rotenberg-Shpigelman, Erez, Nahaloni, & Maeir, 2012). They then provided client centred intervention to the control group and found that the outcome at 12 weeks after intervention was comparable to that of the experimental group (Rotenberg-Shpigelman et al., 2012).

Among all the recent evidence, only one study demonstrated negative results with client-centred intervention. In a cluster randomized controlled trial by Eyssen et al. (2013), a total of 269 patients from 13 hospitals and 29 Occupational Therapists participated in the study. The study found that while process outcome (patients'

satisfaction over the rehabilitation process) was significantly better in the experimental group which received client-centred intervention, other primary outcome (such as the level of disability and participation in intervention) showed no significant differences between groups (Eyssen et al., 2013). The results of the study, however, should be considered with caution. First, intervention for both groups involve the use of COPM, a tool that is inherently client centred. Second, as the authors suggested themselves, it might be due to the fact that in the study, more time was given to consultation and less time was given to treatment in the experimental group (Eyssen et al., 2013). Considering all the evidence related to client-centred intervention discussed thus far, most evidence indicates its positive impact on outcomes.

Based on this central philosophy of a client-centred approach in occupational therapy practice, client education is more than the delivery of information and knowledge through teaching. According to a review of literature related to client-centred practice, a traditional health system—such as one with a biomedical culture—encourages health professionals to have power over their clients in making choices and in goal attainment (Sumsion & Law, 2006). The review suggested that for therapists to implement a genuine client-centred approach, they need to address this imbalance of power and shift it from a relationship based on dependence to interdependence, by enhancing clients' abilities in the intervention process and empowering them to make choices (Sumsion & Law, 2006). The review also identified a few major components of client-centred approaches. They include listening and communicating, partnership, choice and hope.

Based on a client-centred approach with 'listening and communicating' as a major component, understanding client perspectives should be the first step in the planning of any intervention. Therefore, to construct a model of behaviour change in

housework for women with upper limb RSI, which is client-centred, understanding these women's perceptions and experiences about housework within their specific environmental context is essential. However, no study could be found on the exploration of housework as perceived by women with upper limb RSI.

#### **2.7.4 Clinical reasoning in occupational therapy.**

The use of tacit knowledge in clinical reasoning is common among OTs (Carrier, Levasseur, Bédard & Desrosiers, 2010; Fleming, 1994), especially among those who are more experienced (Chaffey, Unsworth & Fossey, 2012; Kuipers & Grice, 2009). Tacit knowledge refers to the knowledge and skills that one knows but cannot tell, and it varies with practice context in the form of institutions. In a number of studies on therapists' clinical reasoning processes across various institutional environments (community, mental health, tertiary care and geriatric settings), agreement was reached on the significant influence of practice context (Barris, 1987; Carrier et al., 2010; Moats, 2006). However, therapists may not be fully aware that the tacit knowledge they have been using in their clinical reasoning process within a specific clinical context could be influenced by a wider socio-cultural environment. A study by Liedberg, Björk and Hensing (2010) on 17 OTs' perceptions of gender found that therapists were unaware they brought their own gender ideology to interventions, which could significantly affect their interaction with patients.

Despite the importance of making tacit knowledge explicit, this is not an easy task. A study by Kinn and Aas (2009) found that therapists have difficulties in describing certain therapeutic tools and methods explicitly. As such, research that attempts to ensure tacit knowledge becomes explicit level is necessary.

According to the ecological model of professional reasoning (Schell, 2009), therapists use both personal and professional lenses in their clinical reasoning (Schell,

2009). As such, to capture therapists' clinical reasoning fully, the present research not only needs to explore therapists' clinical decisions during intervention, but it also needs to explore their personal experiences related to housework.

### **2.7.5 Research questions.**

Upper limb RSI is a costly disease. There is evidence to indicate the presence of biomechanical risk in housework that contributes to this cluster of conditions among women. Although there is consistent evidence suggesting the importance of monitoring mechanical exposures and training or education in computer workers to facilitate improved musculoskeletal health, limited research was found that related to ergonomic education on housework for women with upper limb RSI.

Occupational therapy has an important role in facilitating behaviour change in housework among women with upper limb RSI for managing their condition. Although there are many advantages to plan an intervention based on a theoretical model, no such evidence could be found in occupational therapy research for this group of women. In view of the socio-cultural dimension of housework, the central philosophy of a client-centred approach in occupational therapy, the differences in clinical reasoning among therapists in various practice contexts, and the importance of therapists' personal and clinical experiences in their clinical reasoning process, the following research questions need to be answered to construct a model to guide the planning of an effective ergonomic education program on housework to move it towards a client-centred approach within a clinical setting in Singapore that is predominantly biomedical:

- Question 1: How do women with upper limb RSI perceive their experience of housework before and after upper limb RSI?

- Question 2: How do women with upper limb RSI perceive their experiences of housework in relation to the changes recommended by the therapists?
- Question 3: How do OTs make their clinical decisions while conducting ergonomic education on housework for women with upper limb RSI?
- Question 4: How do OTs perceive their personal experience in housework?

## **2.8 Chapter Summary**

In this chapter, I have presented an extensive and critical review of the literature that led to the research questions I will address within this thesis. In the next chapter, I will describe and discuss the methodology of the two qualitative studies addressing these research questions.



## **Chapter 3: Research Methodology and Methods**

### **3.1 Introduction**

In this chapter, I will state the research purpose and describe the research design of the two main grounded theory studies in this thesis. The ultimate goal of these studies is to answer the research questions essential to constructing a model of behaviour change in housework for women with upper limb RSI within a clinical setting, which is predominantly biomedical. The data collection and data analysis methods will also be presented. The methodology for a pilot study of an assessment tool, which was designed based on these two grounded theory studies, will be described separately in Chapter Seven.

### **3.2 Research Questions**

As described in Chapter 2, in view of the socio-cultural dimension of housework, the central philosophy of a client-centred approach in occupational therapy, the differences in clinical reasoning among therapists in various practice contexts, and the importance of therapists' personal and clinical experiences in their clinical reasoning process, the perception of the therapists and women with upper limb RSI need to be explored to answer the four research questions. As such, the research questions will be addressed in two separate studies as follows.

Study I, titled 'Women with upper limb RSI and Housework' will address two research questions:

- How do women with upper limb RSI perceive their experience of housework before and after upper limb RSI?
- How do women with upper limb RSI perceive their experiences of housework in relation to the changes recommended by the therapists?

Study II titled, 'OT and Ergonomic Education on Housework' will examine two research questions:

- How do OTs make their clinical decisions while conducting ergonomic education on housework for women with upper limb RSI?
- How do OTs perceive their personal experience in housework?

### 3.3 Research Methodology

Research methodology is defined as:

a specific philosophical and ethical approach to developing knowledge; a theory of how research should, or ought, to proceed given the nature of the issue it seeks to address. (Hammell, 2006, p. 167)

It is a science of studying how research is done, the logics behind it and the steps that need to be taken. It provides a way to solve a research problem systematically (Kothari, 2004, p. 8). In other words, the logic of an inquiry leads to the choice of a research methodology. This choice is based on a specific set of philosophical and ethical approaches to developing knowledge that is consistent with the enquiry (or research problem) and world view of the researcher. The chosen research methodology then guides the overall data collection and data analysis methods.

According to Rogers (2006), a researcher needs to start with a close examination of the ideological and philosophical assumptions behind the logic of a specific enquiry. How a researcher frames an inquiry is not neutral, and usually reflects the perspectives of the models with which a researcher views the world (Silverman, 2010a, p. 11). These perspectives usually arise from a particular professional body of knowledge (Dyck, 2000). In the next section, I will examine occupational therapy's philosophy and discuss its influence on my view of the world, a research lens I brought to this study.

#### 3.3.1 Professional philosophy of occupational therapy.

Organismic and mechanistic philosophy are the two main philosophies that guided occupational therapy practice before the 1980s (Reed & Sanderson, 1999, p. 208). Organismic philosophy marked the beginning of the profession, and focuses on an internal locus of control, believing that an individual can initiate change from within and seek symbolic activity. As such, it is consistent with symbolic interactionism,

which considers the world consists of symbols and meanings (Stryker, 1980, pp. 53-54). Some other views of organismic philosophy include: the emergence of constructivism, which states that behavioural change is a transformation and is irreducible; and holism, which states that an organism cannot be represented in terms of specific parts of the body and believes in the important role of free will in one's behaviour (Reed & Sanderson, 1999, pp. 201,203).

In contrast, mechanistic philosophy believes in an external locus of control, that an individual is a passive entity and change must be directed from an external source (Reed & Sanderson, 1999, pp. 201,205). Further, mechanistic philosophy holds a reductionistic view of change, believing that any change in the organism can be reduced to a more elementary form.

During the 1980s and 1990s, occupational science was founded in part, to nurture occupational therapy (Clark et al., 1991; Yerxa, 1993). The identity of occupational science continues to be influenced by the early philosophical beliefs of occupational therapy pioneers. Their view was that occupations provide meaning to people's lives and influence their health (Blanche & Henny-Kohler, 2000). This reflects a predominantly organismic philosophy.

As an OT trained in the 1980s, I am deeply influenced by organismic philosophy. Despite my working experience as an occupational therapist for more than ten years in an acute care hospital, dominated by a biomedical model that is mainly mechanistic and reductionistic, my world view as a researcher remains predominantly organismic and my preferred clinical approach client-centred, one of the many organismic theories (Raskin & Rogers, 1989, pp. 155-194).

Indeed, as a researcher and an OT, the models I use to view reality (ontology) and knowledge (epistemology) are strongly influenced by occupational therapy's

philosophy. Within that, I incline towards a more constructivist viewpoint, with symbolic interactionism theoretical perspectives. The models that researchers use to view reality directly influence the way they frame their research problems (Silverman, 2010b, p. 104). As such, the central philosophy of a client-centred approach in occupational therapy practice serves to guide the logic of my enquiry.

### **3.3.2 Logic of enquiry.**

Adopting a constructivist viewpoint with perspectives provided by symbolic interactionism, I perceive the world as a semiotic world of meanings, reflected in people's use of signs and symbols to think and communicate (Rogers, 2006, p. 79). Knowledge is constructed rather than discovered, and is formed by people's multiple realities and human meaning-making (Rogers, 2006, pp. 80-81). According to Silverman (2010a, p. 10), how a researcher frames a research problem reflects his or her commitment to a particular world view. Indeed, my perspectives informed by symbolic interactionism and constructivism are reflected in the initial research questions of the first two studies of this thesis, as they focus on both the women and their therapists' perceptions and experiences within the larger clinical and socio-cultural context.

Based on the four logics of inquiry behind different research designs (Blaikie, 2000), Rogers (2006, pp. 82-90) discussed three types of enquiry: induction, deduction and abduction. Whereas induction tries to draw conclusions from observations without preconceptions, deduction is theory driven, and most often involves the testing of hypotheses. Among the three logics of enquiry, abduction is a relatively less familiar term but it describes the logic of enquiry that is most appropriate for my two studies. According to Rogers (2006, pp. 86,89), an abductive logic of enquiry involves constructing a new theory with a constructivist ontology and epistemology. It starts with an inductive approach to data, examines all possible hypotheses, and follows this

with a deductive approach to confirm the hypothesis that best describes the data (Charmaz, 2009b, p. 138).

### **3.3.3 Chosen research methodology for the studies.**

Considering the common goal of Study I and Study II of this thesis, as well as the philosophical influence of occupational therapy, I followed an abductive logic of enquiry and employed a constructivist grounded theory methodology (Charmaz, 2009b, p. 137), which is a qualitative research methodology and a variant of the grounded theory as developed by Glaser and Strauss (1967). Abductive reasoning is the logic behind Charmaz's constructivist grounded theory (2009b, p. 137). Charmaz defines it as:

a type of reasoning that begins by examining data and after scrutiny of these data, entertains all possible explanations for the observed data, and then forms hypotheses to confirm or disconfirm until the researcher arrives at the most plausible interpretation of the observed data. (Charmaz, 2009a, p. 186)

Another reason for choosing a constructivist approach to grounded theory for both studies is the consideration of my position as an OT, as well as a woman who experiences musculoskeletal pain from time to time when performing housework in the home. Although classical grounded theory considers 'all is data', it treats the researcher's position in the process as mainly passive and their viewpoint as additional rather than central material (Glaser, 1978). As a woman who has to do housework despite her musculoskeletal pain, I identify with these women's struggles in taking on and adhering to the recommended changes related to housework. As an occupational therapist who has conducted ergonomic education on housework for women with upper limb RSI for many years, I also identify with certain challenges and experiences of OTs who conduct these programmes. A constructivist approach to grounded theory makes

the best match with the two studies, both in terms of the logics of enquiry, as well as my personal and professional roles related to the enquiry.

### **3.3.4 Qualitative research methodology.**

Most qualitative researchers are relativists. According to Charmaz (2009b), relativists consider the world through people's multiple perspectives. They consider that knowledge can be gained through understanding people's situations and actions, and through the researcher's reflexive analysis. Also, according to Creswell (2007, p. 37):

Qualitative research begins with assumptions, a worldview, the possible use of a theoretical lens, and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem.'

He also agreed that the final outcome of qualitative research should include both the voice of the participants and the reflexivity of the researcher.

Whereas quantitative researchers mainly focus on revealing casual relationships, qualitative researchers focus on discovering the phenomena as humans experience it (Minichiello, Aroni, Timewell, & Alexander, 1995, p. 11). For Study I and II, the central phenomena under investigation are the perceptions and experiences of women with upper limb RSI, and OTs who conduct ergonomic education on housework.

### **3.3.5 Grounded theory.**

Among the many diverse qualitative research approaches, some approaches are considered to have better established rigorous data collection and analysis methods than others: grounded theory (GT) is one of them (Creswell, 2007, p. 9). Classical GT, as a qualitative methodology, was developed by Barney Glaser from a positivist tradition and Anselm Strauss from a pragmatist tradition (Glaser & Strauss, 1967). Moving beyond the focus on descriptions, as in other qualitative research methodologies, the main intent of GT is to generate an explanation of a process, action or interaction, with

data collected from a large number of participants (Creswell, 2007, p. 63). In GT, a primary method of data collection is interviews (Creswell, 2007, p. 121), which are transcribed and analysed using a systematic method of data coding.

Since the development of GT by the two well-known sociologists, it has been a general research method widely used by various disciplines including nursing, sociology, the social sciences and psychology (Creswell, 2007, p. 7). Anselm Strauss and Juliet Corbin presented GT as a research method applicable to diverse substantive disciplines (Charmaz, 2009b, pp. 127-128). GT is particularly popular in nursing due to its ability to inform decisions on clinical practice. As Juliet Corbin put it, 'I want to develop knowledge that will guide practice' (Corbin & Strauss, 2008). Renowned grounded theorists such as Barbara Bowers, Juliet Corbin (who used to work closely with Strauss before he passed away in 1996), Janice Morse and Phyllis Noerager Stern are all from nursing backgrounds (J. M. Morse, 2009, pp. 263-279). Within the discipline of occupational therapy, Kathy Charmaz is the most significant grounded theorist. Assuming a relativist epistemology and viewing GT as a general research method that represents a constellation of methods with variations, Charmaz has developed one of the major variants of GT—constructivist GT (Charmaz, 2009b, pp. 129-130).

### **3.3.6 Constructivist grounded theory.**

During the 1970s and 1980s, two schools of GT emerged from the original classical GT. Whereas Glaser remained true to classical GT, Anselm Strauss collaborated with Juliet Corbin and adopted an approach to GT that was considered by some as postpositivism and constructivism (Mills, Booner, & Francis, 2006). Although the procedures and techniques outlined by Strauss and Corbin in their book *Basics of Qualitative Research* (Strauss & Corbin, 1990) are criticised by some as having too



much emphasis on deductive reasoning (Heath & Cowley, 2004), Juliet Corbin in the more recent edition of the book recognised the constructivism perspective and admitted she was influenced by it (Corbin & Strauss, 2008, p. 9). She also agreed with the concept of multiple realities, and that concepts and theories are constructed by researchers out of stories told by participants, instead of emerging from data (Corbin, 2009, p. 39).

Constructivist GT was developed from constructivism ontology and epistemology. In terms of ontology, constructivists believe there are multiple realities as perceived by different individuals, and that reality is a social construction of the mind (Guba & Lincoln, 1994, pp. 509-535). In terms of epistemology, constructivists believe that knowledge is constructed instead of discovered through group and individual experiences (Carpenter & Suto, 2008, p. 22). As such, constructivists consider knowledge building through research is based on interaction between the researcher and the participant in a shared social world (Punch, 1994). In other words, knowledge is constructed jointly by the researcher and the participants, instead of being discovered by the researcher as an objective observer.

### **3.4 Research Methods**

Adopting a constructivist GT approach, this study follows the research strategies and methods specific to a constructivist approach, as outlined by Charmaz (2009a). However, as mentioned by grounded theorist Juliet Corbin, no researcher should be rigid with techniques and procedures (2009, p. 40). As such, I have tried to be flexible in the use of these procedures and techniques. I have also adopted certain strategies described by Corbin and Strauss (2008) that I consider appropriate. In the following sections, I will describe the research methods used for both studies.

### **3.4.1 Sampling.**

Sampling in a GT study requires a researcher to establish sampling criteria for people, cases, situations and/or settings, to find relevant materials for the study (Charmaz, 2009a, p. 100). In a GT study, a researcher needs to choose participants who can contribute to theory development, and the sample begins with a homogenous group of individuals relevant to the topic studied (Creswell, 2007, p. 128).

#### ***3.4.1.1 The setting.***

The study setting is the hand therapy outpatient clinic of an occupational therapy department, in one of the biggest acute care hospitals in Singapore. Singapore has a population of 3,818,200; 74.2% are Chinese. Chinese women make up 38 per cent of the whole Singapore population (Department of Statistics Singapore, 2013).

As mentioned, I have been working as an OT in the hand therapy outpatient clinic for more than ten years. In this particular setting, ergonomic education on housework for women with upper limb RSI is carried out on a one-to-one basis. The clinic is situated within an acute care hospital dominated by a biomedical culture that mostly focuses on diseases and emphasises curative models (Crowley-Matoka, Saha, Dobscha, & Burgess, 2009). Due to heavy work loads, each therapist has to attend to more than one client with different diagnoses and different therapy needs at any one time. For example, once a therapist has instructed a client to carry out a set of exercises on his or her own, the therapist may need to attend a second client to conduct a session of ergonomic education. After this, the therapist may need to go back to the first client and instruct her to do another exercise. Sometimes a therapist may have to attend to more than three or four clients at any one time in such a manner.

Six therapists work in the hand therapy outpatient clinic. Four are specialists in hand and upper limb rehabilitation, who work in the clinic on a permanent basis. The

other two therapist positions are taken up by different junior therapists, who are scheduled to work in the clinic on a rotational basis. Among six therapists, only one has working experience of more than ten years; the others have worked as therapists for less than five years. During ergonomic education on housework, with a standard set of information, the therapists first explain to clients the pathology of their condition, the reason for making changes in housework, the principles of housework ergonomics, followed by examples of different housework methods based on these principles. Depending on each occupational therapist's clinical experience, knowledge, and their understanding of a client, they will then make adaptations to this set of information during the education programme.

In this clinical setting, two major principles are used during ergonomic education for women with upper limb RSI. First, they are told to decrease their personal involvement in housework. Second, they are told to change their method of doing housework, either with or without a labour saving device. While the first principle usually means facilitating the women to delegate housework tasks to other family members or engage domestic help (commonly referred to as a 'maid' in Singapore), the second principle most often involves teaching housework methods they have not tried before. For example, when a therapist finds out that a woman with upper limb RSI has been manually washing her clothes most often the advice given would be to use a washing machine. When a woman with grown children told a therapist she was solely person responsible for housework, most often the advice given would be for her to delegate housework tasks to other family members. In situations where clients reported they had sufficient financial resources, therapists would advise the clients to employ a 'maid'. Based on the model by Westgaard and Winkel (1996), while ergonomic education itself is considered as a modifier intervention, both principles used during the

education are considered as mechanical exposure intervention which aims at reducing the impact on the internal exposures by reducing the biomechanical strain to the women's upper limbs, hence reducing the recurrence or worsening of upper limb RSI and improving their musculoskeletal health.

#### ***3.4.1.2 Participant recruitment and inclusion criteria.***

For Study I, the recruitment period lasted for one year from January to December 2010. Women with upper limb RSI who were referred to the department for therapy and fitted the sampling criteria were recruited and invited by their attending OT to participate in the study. They were referred to the coordinator of the study, an occupational therapist who works in the hand therapy outpatient clinic. The coordinator then explained the study details to these potential participants and obtained their verbal consent. I then contacted these participants and arranged for interviews.

The following lists the inclusion criteria for recruitment:

1. Women of Chinese ethnicity.
2. Women with one or more upper limb RSI conditions according to the Swedish NIWL classification system (Sluiter et al., 2001).
3. Women who need to perform housework-based activities at home.
4. Women who are able to speak English or Chinese.
5. Women who were referred to receive education on changing housework based activities to manage their condition. This includes women who have already received the education and those who are given an appointment to receive education.

For Study II, the recruitment period lasted for one year from January to December 2011. OTs who fitted the sampling criteria were identified and invited to participate by the project coordinator. The coordinator explained the details of the study to all therapists and obtained their verbal consent. I then contacted the therapists and arranged for interviews.

The following is the inclusion criterion for recruitment:

1. OTs with experience in conducting ergonomic education on housework for women with upper limb RSI

### **3.4.2 Ethics approval and informed consent.**

Approval was obtained for both studies from the Human Research Ethics Committee of the University of Sydney and the Centralized Institutional Review Board of a hospital in Singapore in which the research was conducted. The approvals for both studies, with their corresponding participant information sheets and consent forms, can be found in Appendices Eight, Nine, Ten and Eleven. Informed consent was obtained from all participants for both studies.

### **3.4.3 Confidentiality.**

All data were stored in a locked cupboard and were accessible only to researchers involved in the studies. All interview data were transcribed and the participants identified by assumed names. To protect the anonymity of the OT who participated in Study II, only the ethics approvals received from The University of Sydney were attached. The name of the institution has also been kept anonymous.

### **3.4.4 The data.**

In this section, I will describe the methods for gathering and analysing data for Studies I and II. In GT, the process of data collection and data analysis occur simultaneously (Charmaz, 2009a, p. 20). Thus, although the two processes were

described in two separate sections, in reality, they are intertwined. To explore the meanings and process of the topic in depth, it is best for a researcher to gather and analyse the data personally (Charmaz, 2009a, p. 34). As such, I personally carried out all data collection and analytical procedures for both studies.

#### ***3.4.4.1 Gathering rich data through interviews.***

In constructivist GT, instead of collecting data, the process is better described as gathering rich data. 'Rich data are detailed, focused, and full. They reveal participants' views, feelings, intentions, and actions as well as the contexts and structures of their lives.' (Charmaz, 2009a, p. 14). I ensured data richness through conducting in depth interviews and writing field notes, and I collected information on participants' characteristics. I also shaped the data gathering to inform the emerging analysis through theoretical sampling, a process that will be described in later sections.

For both studies, in depth interviews were chosen as the main method for gathering data. In depth interviews allow for exploration of participants' perceptions and elicits information about their lived experiences (Charmaz, 2009a, p. 25), contributing to the gathering of rich data. In depth interviewing was chosen as the primary method of data collection as opposed to focus group because of the method's ability to provide the participants an appropriate level of privacy that allows each of them to express his/her perception freely, truthfully and in depth without being under the influence of peer pressure in a group situation. For both studies, a list of questions were prepared for initial exploratory purposes, fitting the characteristics suggested by Charmaz (2009a, p. 26). They are open-ended and non-judgemental questions, with both broad questions to investigate participants' general experiences and some focused questions to explore participants' specific experiences within a topic (see Tables 3.1 & 3.2). In addition, part of the findings from interviews with women with upper limb RSI

in Study I provide information for interviews with the therapists in Study II. During the earlier part of the interviews in Study II, I asked therapists the meanings they attach to housework. During the latter part of the interviews, I took ten minutes to present the findings of Study I on the meanings that women with upper limb RSI attached to housework (see Chapter 4, Figure 4.1). The viewpoints of the therapists on these findings were then explored with the ending questions, as stated in the interview guide.

Table 3.1

*Interview Guide for Study I***Initial questions**


---

Tell me more about yourself.

How long have you been doing housework?

How much time you spent in housework?

How is the distribution of housework in your household?

How do you carry out the various household tasks before you experience the pain in the upper limbs?

How did you feel about yourself before you experienced the pain in the upper limbs?

What was a typical day like before you had the pain?

---

**Intermediate questions**


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Can you tell me what happened when you first experienced pain in your upper limbs?

How did you feel when you started to experience pain in your upper limbs?

How do you feel now?

How do you feel about housework now?

How do you find your friends and families' attitudes towards your condition?

What is a typical day now?

How much do you involve in housework now?

What do you think about the ergonomic education on housework provided to you by the occupational therapy department?

What are the changes you have made in your housework after the education program?

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**Ending questions**


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How would you describe the whole experience of pain, housework and relationships?

What makes it difficult to follow certain advice and what makes it easy to follow others?

What advice you would want to give to other women in the same situation?

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Table 3.2

*Interview Guide for Study II*


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<b>Initial questions</b>
Can you tell me about your experience as an occupational therapist?
Can you tell me about your experience in client education in general?
<b>Intermediate questions</b>
Can you tell me about your experience in ergonomic education for women with upper limb RSI?
Can you tell me about your experience in ergonomic education on housework for this group of women?
Can you tell me about your own housework experience?
What does housework mean to you?
What do you think housework means to your clients?
<b>Ending questions (After presentation of preliminary results of study I on meanings of housework perceived by women with upper limb RSI)</b>
What do you think of the meanings of housework perceived by women with upper limb RSI?
What do you think about the educational materials used in ergonomic education on housework for women with upper limb RSI?
What are the difficulties you encountered in the conduction of ergonomic education on housework for women with upper limb RSI?
How practical and useful you consider ergonomic education on housework for this group of women?

---

Interview Strategies: To gather rich data that reflects research participants' lived experiences, I was mindful to use certain strategies during the interviews for both studies. To achieve this, I:

- Conducted the interview at a place that could stimulate their thoughts on the topic. For Study I, it was the women's homes, and for Study II, it was around the clinic where the therapists conducted the education.
- Allowed flexibility to explore a statement or a topic when it spontaneously arose.

- Encouraged details or explanation and confirmed meaning when it was not clear.
- Asked about participants' thoughts, feelings and actions.
- Restated participants' points to check for accuracy.
- Waited for participants to break a silence and express their views at their own pace.
- Ensured that each participant had a chance to ask questions at the end of the interviews.

In contrast to the original data collection approach of classical GT, which did not emphasise rapport between the researcher and participants (Glaser & Strauss, 1967), constructivist grounded theorists pay special attention to establishing relationships with the participants, modifying any power imbalance in the relationships and establishing reciprocity (Mills, Bonner, & Francis, 2006). I employed different relationship-building strategies for Study I and Study II. The use of different strategies was due to the differences between my relationships with women with upper limb RSI in Study I and the therapists in Study II.

For Study I, the participants are women with upper limb RSI who have attended the hand therapy outpatient clinic of the occupational therapy department in an acute care hospital. I have only attended to five of these women as a therapist previously; the other women were referred to me by OTs in the clinic. I paid a lot of attention to building relationships with these women and addressing the potential imbalances of power in some of these relationships. The following is a list of the strategies I used:

- I engaged them with small talk from the beginning and did not jump into the interview. I tried to make the interview process feel natural and unofficial.

- Although I made it clear to the women the suggested place for the interview was their own homes, I was also explicit in telling them they had control over the date, time and place of the interview.
- I explained that the interview was to learn from them so we could improve the programme for future clients. I emphasised the ‘learning’ part to place my status as a therapist and a researcher at a relatively lower power level.
- I used self-disclosure to reveal my own involvement in housework and my experience of pain in housework to reinforce a non-hierarchical relationship.
- I was conscious of letting the women assume power over the direction of the conversation during interviews, and allowed time for them to express their views on topics that did not necessarily address my questions.

For Study II, most of the therapists who participated in the interviews have worked with me previously as colleagues. Some were comparatively junior therapists who could be worried that what they said during the interviews might reflect badly on them as therapists. To ensure a balance of power and gain their confidence to fully reveal their perceptions, I used the following strategies:

- I engaged them with small talk at the beginning and did not jump into the interview, trying to make the interview process feel natural and unofficial.
- I explained to the therapists the interview was to learn from them so we could improve the programme for future clients. I emphasised the ‘learning’ part to enable understanding that it was a collaborative effort between us, as in a team.
- I was conscious of letting the therapists assume power over the direction of the conversation during interviews, and allowed time for them to express their views on topics that did not necessarily address my questions.

- I assured them that the information from the interviews would not be revealed to their supervisors or the department head in any way that would identify them.

#### *3.4.4.1.1 Gathering rich data through field notes.*

Certain fundamental social processes that happen in a setting shape participants' actions and understandings (Charmaz, 2009a, p. 20). Thus, to construct data that reflects the participants' reality, the interview has to be put in context (Charmaz, 2009a, p. 21). For each interview, I recorded one set of field notes in narrative style to record relevant information within the interviews as a verification of the interview data during the data analysis process:

- Other people who were present in the interviews. For example, during the discussion regarding family support in housework, the responses of the participants will need to be interpreted with information on the family members present during the interviews.
- The place where the interview was conducted.
- The participants' emotions during the interviews.
- The participants' actions and non-verbal gestures in the interviews that I observed as significant.

#### *3.4.4.1.2 Information on participants' characteristics.*

With the interviews, I also noted participants' characteristics relevant to the study topic. For Study I, I collected information on the women's age, marital status, diagnosis, their employment status, and whether they had a maid at home. For Study II, I collected information on the therapists' age, ethnic origin, countries of origin, marital status, gender, years of experience as an occupational therapist, years of experience in

conducting ergonomic education on housework for women with upper limb RSI, whether they lived with their parental families and whether they have ever have a maid.

### **3.4.5 Data analysis and theory construction.**

An important concept in data analysis with GT is constant comparison (Stern, 2009, p. 61). Specific to constructivist GT, data analysis implies the acknowledgement of subjective experiences (Charmaz, 2009b, p. 140). It recognises that the co-construction of data shapes analysis (Mills, Bonner, et al., 2006), engages in reflexivity (Charmaz, 2009a, p. 15) and emphasises participants' views and voices (Mills, Bonner, et al., 2006). In this section, I describe the data analysis procedures which reflect these considerations.

#### ***3.4.5.1 Transcribing data.***

By studying the data closely, a constructivist GT can learn what his or her research participants are saying and what they mean (Charmaz, 2009a). Instead of hiring someone to transcribe the data, I chose to be involved in the process. In the process of transcribing the data and being more intimate with it, I was in a better position to learn what the participants were trying to say. When I transcribed each interview, I referred to the field notes corresponding to that interview frequently and reflected upon the meanings of the conversations in the interviews. When I noticed certain gaps in the conversation that I needed to follow up, I would write down the questions and telephoned the participants for clarification.

For interviews that were conducted in Mandarin, I first transcribed the data in its original language before translating the content into English for data analysis. To ensure translation accuracy, a back-translation was conducted (Brislin, 1970). I engaged a translator to translate the English version back to Chinese. The final translated Chinese version was then compared with the original transcribed data, and I conferred with the

translator to identify any discrepancies. Appropriate adjustments were then made to the English version.

#### ***3.4.5.2 Coding.***

For both studies, all interview data were analysed according to the procedures of coding outlined by grounded theorist Charmaz (Charmaz, 2009a, pp. 42-71). I used line-by-line coding during initial coding. This coding was useful as a corrective strategy to avoid imposing only my preconceived ideas on the interview data. For example, when a participant said, 'I like cooking', this line was then coded as 'feelings towards housework'. I then sifted through the initial codes; the most conceptual codes were selected through focused coding. For example, all coding related to feelings and attitudes towards housework were coded under the conceptual code 'meanings in housework'. The conceptual codes were then listed and used to code the original transcribed interview data again. I then tried to relate the conceptual codes to one another through axial coding by returning to the interview data. For example, the conceptual code 'meanings in housework' was then linked with another conceptual code, 'housework habits and routines'. This process was carried out in conjunction with another process called memo writing.

#### ***3.4.5.3 Memo writing.***

For both studies, I started memo writing at the same time as data coding. I mainly used diagram representation with my memo writing to construct multiple versions of preliminary conceptual frameworks based on the data codes. I repeatedly examined the original interview data and compared them with my memos to locate the conceptual codes for each research participant, and examined their relationships with other participants' codes.

I also used memo writing to reflect on the data and to avoid forcing data into preconceived codes and categories. For both studies, I took notice of both experiences that I identified with and those that I did not. I ensured that the final frameworks were representations of the whole range of experiences constructed by the participants and me through the interviews.

#### ***3.4.5.4 Theoretical sampling of data.***

Theoretical sampling is:

a method of data collection based on concepts/themes derived from data. The purpose of theoretical sampling is to collect data from places, people, and events that will maximize opportunities to develop concepts in terms of their properties and dimensions, uncover variations, and identify relationships between concepts. (Corbin & Strauss, 2008, p. 143)

The logic of theoretical sampling starts with ‘constructing tentative ideas about the data, and then examining these ideas through further empirical enquiry’ (Charmaz, 2009a, p. 102). This can be done through collecting more data or comparing existing data (Corbin & Strauss, 2008).

##### ***3.4.5.4.1 Gathering more data.***

For both studies, interviews were conducted over a period of one year. In keeping with the abductive logic of enquiry, additional questions were added to the interview guides after the preliminary frameworks were constructed, based on the first five interviews. The purpose of these questions was to further explore, as well as confirm, the categories and the relationships among categories in the preliminary frameworks.

For Study I, the preliminary framework consisted of early framework concepts with unclear relationships between categories. Questions were added (see Table 3.3) to

explore and confirm more specifically the meanings women attach to housework, women's social experience in housework before upper limb RSI, as well as their experience of pain and experience as a health care service consumer after upper limb RSI. Specific questions to explore categories and confirm relationships among categories are marked with '\*' in Table 3.3.

For Study II, the preliminary framework consists of early concepts of the stages of change women with upper limb RSI went through, reflected in the therapists' clinical reasoning process when ergonomic education was conducted. Questions were added (see Table 3.4) to explore and confirm more specifically how therapists assess willingness, their expectations of clients after discharge, as well as the challenges they encountered regarding issues of trust in the therapist-client relationships, and as imposed by the clinical environment. Four therapists were interviewed twice for their professional insights that result from intensive involvement in this clinical area, and to refine the relationships between the categories within the conceptual framework developed from the study. Questions to explore categories and confirm relationships between therapists' clinical actions and their perceived goals of ergonomic education on housework are marked with '\*' in Table 3.4.

#### *3.4.5.4.2 Comparing existing data.*

For both studies, the preliminary frameworks from the first five interviews were constantly modified with data analysis of each subsequent interview. After I analysed the data from each subsequent interview, I then went back to the interview data of the previous participant and wrote their story. Through this process, I tried to identify the fit of the data with the frameworks and to look for data to fill in the characteristics of categories and relations between categories.



Table 3.3

*Additional Questions for Study I***Additional questions—Study I**


---

Can you tell me how you started to learn housework?

Can you tell me more about your housework experience since you first started to do it?

\*What does the housework experience in these early years influence your housework experience later?

What does housework mean to you?

\*What did housework mean to you before you have this pain in your upper limbs?

Can you tell me about your experience with the symptoms?

Can you tell me about your experience with other people with similar condition?

\*Can you tell me how you feel about the advice given by health professionals regarding housework?

\*Can you tell me how you feel about housework now?

\*Can you tell me about your involvement and method in housework nowadays?

---

\*Questions to explore relationships among categories

Table 3.4

*Additional Questions for Study II***Additional questions—Study II**


---

How do you know if the clients are willing to listen to you in the first session?

How do you know if your clients are willing to try out the change after you gave advice?

\*What do you want to achieve for these women when they are still attending therapy?

\*What do you want to achieve for these women after they are discharged?

\*What do you consider as a success for this program?

\*What do you think you have to do to achieve this success?

\*What needs to be improved for this program?

How is your clients' progress after they are discharged and how this information is useful?

What is your experience regarding your clients' trust towards you as a therapist in this education process?

How do you find the impact of the clinical environment on the education process?

---

\*Questions to explore relationships between therapists' clinical actions and their perceived goals of ergonomic education on housework

#### ***3.4.5.5 Theoretical integration.***

The process of theoretical integration started alongside the comparison of interview data with storytelling, as described above (Corbin & Strauss, 2008, pp. 106-107). I compared and reflected on the main themes of the conceptual frameworks and the stories I wrote for each participant for both studies, to determine the central phenomena. I then realised the central phenomena reflected a symbolic interactionist perspective on ‘identity-self’, one of the 18 theoretical coding families suggested by Glaser (1978, p. 74). For Study I, the core themes and their relationships reflect a central phenomenon of struggle between the women’s self-identity as a homemaker *before* upper limb RSI, and managing conflicts between their roles as a homemaker and a client in a hospital *after* upper limb RSI. For Study II, the core themes and their relationships reflect a central phenomenon of therapists’ struggles in the education process between their expectations of their professional self, as someone supposed to give advice on housework as an expert, and their private self that lacks personal experience of housework.

#### ***3.4.5.6 Theoretical sufficiency.***

Most qualitative studies use ‘data saturation’ as a guide to determine the sample size of data collection. The term data saturation was first used by the two founders of GT (Glaser & Strauss, 1967). They used the term to refer to the point when no additional data can be found to develop the properties of a category. However, grounded theorists’ claim to data saturation has many issues concerning legitimacy (Charmaz, 2009a, p. 114). According to Corbin and Strauss (2008, p. 149) data can never be saturated and eventually a researcher has to decide whether the concept is sufficiently well developed for the specific research purpose. As such, I chose to use the term ‘theoretical sufficiency’, as suggested by Dey (1999, p. 257).

The conceptual frameworks constructed from the initial five interviews for both studies were sketchy, lacking in properties and relationships. As a researcher and an occupational therapist, I decided they were insufficient to contribute to a model of behaviour change in housework for this specific group of women.

Throughout the interviews, I kept revising the frameworks. I then went back to the data I gathered from the earlier interviews and constructed the final frameworks for both studies and integrated them to construct a model of behaviour change in housework for women with upper limb RSI.

I then compared this model with current theories of health behaviour change in health education. I observed that although there are comparable concepts between this model and other theories of health behaviour change, there are also important differences between them which address issues of behaviour change specific to this group of women in relation to housework. With this observation, I determined that theoretical sufficiency was achieved.

#### **3.4.6 Rigour and quality.**

Using Charmaz' criteria for GT studies (Charmaz, 2009a, pp. 182-183), I planned the research for both studies accordingly and as summarised in Tables 3.5 to 3.8.

Table 3.5

*Criteria for Grounded Theory Studies—Credibility***Credibility**

Q: Has your research achieved intimate familiarity with the setting or topic?

As an occupational therapist who conducts the education and a woman who experiences musculoskeletal pain with housework, I have achieved intimate familiarity with the setting and the topic.

Q: Are the data sufficient to merit your claims? Consider the range, number, and depth of observations contained in the data

There are 15 women and 14 therapists interviewed in the studies. According to study on determining sample size for data saturation in qualitative studies by analysing the data from sixty interviews with women from two West African countries (Guest, Bunce, & Johnson, 2006), it was found that data saturation occurred within the first 12 interviews. In terms of theoretical sufficiency (refer to 3.4.5.6). The depth of observations in both studies are reflected in the findings (refer to Chapters 4 and 5).

Q: Have you made systematic comparisons between observations between categories?

Constant systematic comparisons are the core of data analysis for both studies (refer to 3.4.5)

Q: Do the categories cover a wide range of empirical observations?

The categories for both studies are grounded in empirical observations of most of the interviews. Also, for both studies, although the major categories are grounded on experiences of all who are interviewed, extreme variations were observed. For Study I, although most women were found to take on only some of therapists' advice, one participant was found to adhere to all therapists' advice and even came up with ideas to make ergonomic changes in housework. For Study II, although most therapists did not fully understand the deep meaning attached to housework, a few of them demonstrate their understanding through their description of how they interact with their clients.

Q: Are there strong logical links between the gathered data and your argument and analysis?

Yes. The gathered data provide evidence for categories of my analysis and argument for both studies in the construction of a model (refer to Chapters 4 to 6) This is achieved through systematic coding and theoretical integration (refer to 3.4.5)

Q: Has your research provided enough evidence for your claims to allow the reader to form an independent assessment—and agree with your claims?

Yes. All evidence is integrated and presented under each category of the two conceptual frameworks constructed (refer to Chapters 4 and 5)

Note. Criteria adapted from Charmaz (2009a, pp. 182-183)

Table 3.6

*Criteria for Grounded Theory Studies—Originality***Originality**

Q: Are your categories fresh? Do they offer new insights?

Yes, as evidenced in the discussion of the major findings of each study (refer to Chapters 4 and 5).

Q: Does your analysis provide a new conceptual rendering of the data?

Yes, my analysis of the findings from both studies ultimately led to a model of behaviour change related to housework-based activities for women with upper limb RSI in Singapore.

Q: What is the social and theoretical significance of this work?

The model can be applied to guide the planning and implementation of ergonomic education on housework in the Singapore context and has the potential to be adapted and used elsewhere.

Q: How does your grounded theory challenge, extend, or refine current ideas, concepts, and practices?

The final model provides specific concepts and stages of behaviour change related to housework-based activities. For example, when compared with TTM of change, important additional stages were observed in the model that are essential in planning an ergonomic intervention in housework for this group of women (see Chapter 5).

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Note. Criteria adapted from Charmaz (2009a, pp. 182-183)

Table 3.7

*Criteria for Grounded Theory Studies—Resonance***Resonance**

Q: Do the categories portray the fullness of the studied experience?

Yes, by comparing the categories with health theories based on other health related experience.

Q: Have you revealed both luminal and unstable taken-for-granted meanings?

Yes. For example in Study I, meanings of housework meant more than pride or burden etc. Housework indicates a bigger picture of women's perceived self-identity of themselves and related emotions. For Study II, being a therapist within the context of the study topic means more than just conducting ergonomic education on housework for women with upper limb RSI but also a continuous evaluation of the private self and the professional self.

Q: Have you drawn links between larger collectives or institutions and individual lives, when the data so indicate?

Yes. For Study I, links were made to the women's lives at home, in the past and within their socio-cultural context. For Study II, links were made to the biomedical environment where the therapists worked in.

Q: Does your GT make sense to your participants or people who share their circumstances? Does your analysis offer them deeper insights about their lives and worlds?

I have related my findings to individuals who were interviewed a second time and they expressed agreement on my findings. Therapists in Study II, however, tend to express more interest and agreement with the findings and expressed that the knowledge of the findings will change how they will interact with their clients in the future.

Note. Criteria adapted from (Charmaz, 2009a, pp. 182-183)

Table 3.8

*Criteria for Grounded Theory Studies—Usefulness***Usefulness**

Q: Does your analysis offer interpretations that people can use in their everyday life?

Yes, my interpretations for both studies led to conceptual frameworks that were used to inform a model of behaviour change related to housework-based activities for women with upper limb RSI. This model was used to guide the design of the education.

Q: Do your analytic categories suggest any generic process? If so, have you examined these generic processes for tacit implications?

Yes, the model of behaviour change (see Figure 6.1) is a generic process that can be used to guide ergonomic intervention in housework for women with upper limb RSI.

Q: Can the analysis spark further research in other substantive areas?

Yes, refer to Chapter 9 for the future recommendations on research.

Q: How does your work contribute to knowledge? How does it contribute to making a better world?

The model and the assessment tool designed based on the model (refer to Chapters 6 and 7) can be used as an initial step to bring the focus of client-centred approach back to occupational therapy practice in a biomedical environment. It can guide therapists in their clinical reasoning when they conduct ergonomic education on housework and facilitate them to work towards individualised and relevant education for their clients within the limitations of the clinical environment.

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Note. Criteria adapted from (Charmaz, 2009a, pp. 182-183)

### **3.5 Chapter Summary**

In this chapter, I have outlined the research methodology and research methods for Study I and II, showing the consistency in my decision making within the research process. In the next chapter, I will present the findings of Study I, a discussion and a conceptual framework of these women's decision making in housework after upper limb RSI.

## **Chapter 4: Study I: Women with Upper Limb RSI and Housework**

### **4.1 Introduction**

The aim of this chapter is to analyse and discuss how Chinese women in Singapore with upper limb RSI make decisions to change their housework activities and routines upon receiving advice from OT and other health professionals. In the following sections, the characteristics of the women, and the various themes and subthemes that emerged from the interview data will be described. A conceptual framework of the women's decision making in housework, which was constructed around these themes and subthemes, will be presented and the implications discussed.

### **4.2 Participants**

Fifteen women with upper limb RSI were interviewed. Each interview lasted for approximately one hour. The mean age of the women was 58.5 years (SD 8.3), with an age range of 47–71 years (see Table 4.1). According to a study that was carried out in the same clinical setting, it was found that among the clients with upper limb RSI, 827 (75%) were women, forming a major client group in the clinic (Yang & Cheung, 2013). Also, the majority of women fell into the age range of 51–60 years old, followed by the age range of 41–50 and 61–70 years old (Yang & Cheung, 2013). As such, the participants are considered as representative of clients with upper limb RSI referred to the department.

In terms of other characteristics, all women in this study carried out the majority of housework activities in the home. Two were in full time paid work at the time of the interview and were considered to contribute to housework activities on a part time basis. Thirteen had worked in full time jobs at an earlier stage of their lives. All except three of the women lived with their spouses, and ten had teenage children living at home. One woman had to take care of her three-year-old granddaughter daily. At the



time of the interview, six women had full time 'maids' to assist with their housework, and five received some form of help from their family members. In Singapore, domestics are commonly referred to as 'maids' or 'domestic help'. Within the context of this study, the term 'maid' was frequently used by the women, and thus will be used in this thesis.

Table 4.1

*Demographics of Women with Upper Limb RSI*

<b>Women</b>	<b>Age</b>	<b>Marital status</b>	<b>Diagnosis</b>	<b>Currently employed in paid work?</b>	<b>Help in housework (family or maid)</b>
1. Alice	55	Divorced	Right De Quervain's tendinitis	No	Family
2. Annie	71	Married	Right ring trigger finger	No	NA
3. Cindy	54	Divorced	Left trigger thumb	No	NA
4. Chloe	47	Married	Trigger finger	Yes, part time	NA
5. Emily	65	Married	De Quervain's tendinitis	No	Maid
6. Karen	76	Widowed	Right trigger finger, De Quervain's tendinitis	No	Family and Son's Maid (help during weekend)
7. Lily	48	Married	Right trigger thumb	No	Family
8. Lillian	60	Married	Trigger fingers, CTS	No	Maid
9. Rosie	55	Married	Left De Quervain's tendinitis	No	Family
10. Theresa	63	Married	Osteoarthritis of hands	No	Family
11. Tammy	61	Married	CTS, trigger finger	No	Maid
12. Silvia	51	Married	Right De Quervain's tendinitis	Yes, part time	NA
13. Mandy	65	Widowed	Osteoarthritis of hands	No	Maid
14. Tiffany	53	Married	Right golfer/tennis elbow	No	Maid
15. Yanny	54	Married	Right tennis elbow	No	Maid

### **4.3 Focus of the Study and Themes**

As described by the women in this study, housework revolved around five main domestic tasks: cooking, cleaning, grocery shopping, laundry and childcare. From the interviews, four main themes and two levels of subthemes emerged. These themes reflect two main foci. The first two themes 'Forming housework meanings' and 'Developing housework routines' reflect the significance of the women's social role and identity as a home maker and reflect their goal to maintain family and personal harmony as a homemaker before the diagnosis of upper limb RSI. The last two themes 'Interpreting the experience of pain' and 'Interpreting the Health Professionals' advice' reflect the women's responses to the conflict arising between their role as a homemaker and as a client in a hospital when OTs and other health professionals advised them to make certain changes in housework to manage their medical condition. They reflect the women's perceived potential 'risk' to their family and personal harmony when they consider making changes in housework as recommended by health professionals after the occurrence of upper limb RSI (Table 4.2 & Table 4.3).

Table 4.2

*Women's Decision Making in Housework before Upper Limb RSI*

<b>Main themes</b>	<b>First level subthemes</b>	<b>Second level subthemes</b>	<b>Ultimate goal</b>
1. Forming housework meanings	Listening and observing	A woman's responsibility	Family and personal harmony
	Doing and feeling	'My responsibility' 'My burden' 'My pride'	
	Fulfilling family's needs	Comfortable place and good food Health Quality time Not to be burdened	
	Fulfilling personal needs	Own health Feel good	
2. Developing housework habits and routines	Housework involvement	I choose to do as much as possible I must do this task	
	Housework method	I choose a fast method I choose a good method	

Table 4.3

*Women's Decision Making in Housework after Upper Limb RSI*

<b>Main themes</b>	<b>First level subthemes</b>	<b>Second level subthemes</b>	<b>Potential risk</b>
1. Interpreting the experience of pain	<p>I didn't feel the pain</p> <p>I felt the pain</p> <p>I felt the pain but don't think it is anything serious</p> <p>I am just getting old, it is normal</p> <p>I don't want to think that I need to cut down my housework</p>		
2. Interpreting health professionals' advice	<p>Are the changes necessary? My pain experience</p> <p>Are the changes necessary? Other people's pain experience</p> <p>Are the changes possible?</p> <p>Are the changes acceptable?</p>	<p>I didn't feel it until she palpated it</p> <p>She told me the possible consequences</p> <p>I experienced pain relief with changes</p> <p>My financial resources</p> <p>My family' attitudes</p> <p>My habits and routines in housework</p> <p>My meanings in housework</p>	<p>Family and personal harmony</p>

## 4.4 Forming Housework Meanings

The participants began to form their meanings of housework when they observed and participated in housework as children in their parents' homes. This continued with the change of roles related to housework after marriage. The following describes the findings of the meanings women attach to housework, followed by a summary of these meanings, as illustrated in Figure 4.1.

### 4.4.1 Listening and observing.

Participants were exposed to traditional meanings associated with housework as women's work and as 'a woman's responsibility', through listening and observing older female role models at home when they were young.

#### 4.4.1.1 *A woman's responsibility.*

Housework as a woman's responsibility was taught to women early in life.

Tammy related her grandmother's views when she was a teenager. She said:

You must learn how to cook, you know, in the future when you are married you need to know how to cook, you have to learn how to keep house clean before people will come and see. Make sure your house is clean all the time.

Later on, when Tammy was to be married, she related what her mother said, 'you are going to marry into a very big family, you have a lot of responsibilities'. Through their observation of an older female role model in the family, participants started to learn that housework was women's work and a woman's responsibility, regardless of whether she held a paid job or not. Alice described how her mother coped with housework while holding a full time paid job by delegating some housework tasks to her and her sister when they were young. She said:

Yes, of course, we are being well trained. Of course, my mum is busy earning money; she is sewing clothes so you know she will do the more difficult ones (housework) then pass to my sister and very soon to my hand.

Compared to listening, observing older female family members' participation in housework before marriage was even more powerful in forming these housework meanings. Although Tiffany's mother preferred her to be a career woman, Tiffany's observation of her mother's role as a full time homemaker led her to consider that providing and maintaining the home for her family was more important than her career as a teacher. Even though she was working full time, Tiffany continued to manage all housework by herself.

A strong gender ideology went hand-in-hand with this meaning of responsibility in housework among the women. All observed housework as something mainly carried out by women, rather than men during their childhoods. A strong gender ideology was explicitly mentioned by six women (Chloe, Silvia, Yanny, Tammy, Theresa & Karen). This was expressed by women who were born from the 1930s all the way to the 1960s. Chloe, the youngest, said:

I guess that it is a family tradition kind of thing that guys will be...won't touch housework at all. So my mother does everything, even include my father ... who goes out to work, my mother will prepare what shirt he will wear, handkerchief to put inside the pocket...stuff like that, to that extent, you know when he comes back, make sure that the drinks is there. You know that kind of ... very traditional.

All reported that from their childhood experiences, males in the family were not expected to do housework. Among all the participants, only Theresa mentioned that her

father used to help out with housework as she was growing up; her mother could not engage in housework due to poor health.

#### ***4.4.1.2 Doing it and feeling it.***

While childhood observations and experiences were important, it was only through actually doing housework that these traditional meanings started to be personally felt and more meanings emerged. While a few of the women started housework as early as seven to eight years old, most were not involved in housework until their teenage years. Once they started to do housework, they also started to feel the 'responsibility of housework'. Some felt it as a 'burden', while others developed a sense of 'pride'.

#### ***4.4.1.3 'My responsibility'.***

Karen noted that once she started doing housework, she felt it became her responsibility. She said:

it was like kind of your responsibility. It is like once you started to do it, this kind of work belonged to you. In those days, it is how it is like in family, it became your responsibility.

The meaning of housework as a responsibility was not felt by most of the women prior to marriage when they only helped out with housework. However, once the women got married, their sense of ownership and responsibility over housework increased. Cindy said, 'I feel that it is my own place, so needs to be tidy and you feel comfortable at home'. Silvia, Tammy and Emily expressed explicitly this sense of responsibility or ownership, describing housework as 'part and parcel of life'.

In fact, a great sense of ownership and responsibility in providing and maintaining the home was shared among all women in this study. All viewed housework as their 'own responsibility', regardless of whether they were in paid work



or not. Even among women whose housework was shared with maids (Emily, Tammy, Mandy, Lillian, Yanny & Tiffany) or various family members (Lily, Alice, Rosie, Theresa & Karen), they still perceived themselves as the final check point on all housework tasks. Emily, who had two maids to help with housework, mentioned that women who tried to avoid housework were 'lazy'.

#### **4.4.1.4 'My burden'.**

When housework became a responsibility the women felt they had no choice over, the discourse of housework as a 'burden' emerged. Women who were forced to participate in housework when they were very young perceived this burden early in life. They associated a sense of burden with housework when it was too physically demanding or interfered with other more important roles in their lives. Theresa said:

Because in those days I was young. And to do so much housework is very tiring, I also need to study ... When I was young, I needed to study and do all those, and I felt irritated when I saw my classmates ... So much housework and also needed to cry so much before I was allowed to study.

However when these women became adults and got married, this sense of burden was reduced, as housework was experienced as being relatively less physically demanding and more meaningful. Theresa explained, 'So after I got married, even washing clothes for my own children is easy as those were little babies' clothes only. Also I was happy doing it for my own children'.

Among the other women who did not need to, or were not expected to do much housework before marriage, only one woman mentioned she started to feel the burden of housework after she was married. Rosie said:

When it is not your main responsibility, it is just helping around until it becomes your main responsibility ... When it is not your responsibility, you feel like

helping, you help, you feel like doing, you do, but when it is your own house if you don't do it one week two weeks three weeks then you see the dust growing. Then you still have to do, right?'

Although some women perceived housework as becoming more difficult as they got older, those who perceived they 'have a choice' over housework did not consider housework a burden. Karen, who experienced housework as becoming more difficult as she got older said, 'When I was young, I didn't feel that it was hard. No matter how busy I was, I didn't feel that it was hard. I felt it hard only when I got old'. However, as she felt she had a choice over housework with the great support she had from her daughter and the son's maid, she did not perceive cooking for her children's family during weekends as a burden. She still took pleasure in cooking for her children and grandchildren during these weekend sessions, in the role of a mother and grandmother.

#### ***4.4.1.5 'My pride'.***

With increased participation in housework, the women started to develop skills in housework and form perceptions about their performance. When they saw themselves as efficient, able to achieve a high standard or excellent skills in housework, they also started to feel pride in their work. Silvia's pride developed with a personal perception of her efficiency in managing both housework and paid work after marriage. She said, 'And basically I am quite a fast worker I would say, so I can handle the whole ... everything all at one go'. Tammy took pride in her high standards when doing housework, 'we are very particular about housework.'

The meaning of housework as 'my responsibility' and 'my pride' reinforces each other. When women felt a strong sense of responsibility over housework, they would strive to do it well. In the process of involvement, they would start to feel a sense of pride in housework, which in turn reinforced the sense of responsibility. As such,

these women also tended to judge other people's housework performance as below their standard in one or more ways.

Some women took particular pride only in a specific housework task when they felt that they were very good at it. They felt they had the ability to generate a superior outcome to others, giving a sense of satisfaction or achievement in performing the task. The task was different for each woman. While some took pride in cleaning, others took pride in cooking.

Karen, Emily, Lillian, Tammy and Mandy explicitly mentioned cooking as a source of pride, considering it a task requiring skills. They considered they achieved a standard in this task that was difficult to achieve by other people. Mandy said, 'normally I don't like washing dishes ... I like cooking, sense of achievement. For washing dishes, it is like everyone can do it'. Another participant, Emily, even mentioned the intention to publish a book of her secret recipes in the future.

Some explicitly mentioned cleaning the house as a source of pride. They reported the house's cleanliness reflected their abilities as a homemaker, and gave them a sense of gratification. As Silvia reported, 'After that, I could see the house clean and I felt satisfied'.

When a woman perceived that she lacked skills in a certain task, she would take no pride in it. Rosie, who took no particular pride in cooking, talked about how she was not good at cooking and she compared her skills with her husband's. She said, 'He do the main thing, because I don't know how to cook actually, so he do the main cooking then subsequently I pick up'. Then, 'But cooking I am not good'.

Some women related their sense of pride in housework to the training they received when young. As a result, they perceived themselves as more independent and more capable. They considered perpetuating this with their children as important. Lily

and Tammy, who started to do housework when they were teenagers, explicitly expressed their perceptions of housework as a form of training: not a burden but a source of pride. Tammy took up housework even though there was no need for her to help. She said with a hint of pride, 'My grandmother used to train us, although we have servants, she used to make us responsible for certain things'. Alice, who started housework at a much younger age said, 'we are being well trained'. She showed her belief in this by training her sons, 'that is how I train my sons as well, this is a training repeat'.

#### **4.4.2 Fulfilling family needs.**

All women showed strong personal values in making family, particularly their children, as their priority in life after marriage. Fulfilling their family's needs was of utmost importance to the women. Comparing her paid job and her role as a homemaker, Tiffany said:

To me, a woman's career is secondary and my family always come first and even during the interview for my teaching career, I told them about that. So my career is always secondary, family comes first.

Even Theresa, who 'hated housework to the core' due to difficult experiences she had with housework during childhood, expressed that 'I was happy doing it for my own children'.

Further meanings emerged when women considered family needs in the light of their role identity as a wife and a mother. While all the women's families shared some common needs, there were other needs that were specific to an individual's family. Housework or certain domestic tasks were then perceived as either a means or an obstacle to fulfill these needs, depending on the specific situation of each family.

#### ***4.4.2.1 Comfortable place and good food.***

All women identified with the importance of fulfilling the basic physical needs of their family to be fed and to live comfortably. When asked the meaning of housework, participant Lily, who was married with children, said, 'housework is basically to keep the house clean, livable, pleasant place for the family to spend time in'. In other words, to Lily housework was something she had to do in her role as a wife to her husband and as a mother to her children.

The responses of the women's families also influenced their perceptions of which domestic task should be a priority. Cooking was most frequently mentioned by the women in terms of its value in fulfilling a family's physical needs, as they observed the responses from their families. Cindy talked about how she and her daughter did not like having takeaway meals too often, and she had to cook:

But for the younger daughter and me, we will eat out for one dinner, and the next we will not be able to take it, and have to cook at home.

Cooking was considered so important by some women that personal involvement in it was highly valued. For Emily, the fact that cooking could lead her children to remember her when they grew up became a strong motivator for her to persevere. Emily said, 'children will remember nothing you have done for them but the good food you cook for them'.

#### ***4.4.2.2 Health.***

Some women need to fulfill more than just the basic physical needs of their families through housework. This could mean a need to ensure a high standard of cleanliness when the women needed to take care of a grandchild at home. It could also result in being frequently engaged in preparing and boiling Chinese medicine when they needed to take care of a family member who was sick.

Rosie explained why it was so important for her to make sure that the floor was not dusty. She stated that as her husband was allergic to dust, maintaining a relatively dust free environment through housework was important to keep her husband healthy. Alice, a caregiver to her granddaughter, also talked about how important it was for her to clean the floor frequently, as her granddaughter had just started to learn to crawl. Thus, a clean floor was essential for her granddaughter's health.

The family health needs differed among women. As a result, the meanings of a housework task could be different from one participant to another. For Rosie, her concern was a clean environment; if she had to eat take away food, it did not really bother her. She did not relate home cooking as a way of keeping her family healthy. For participant Lillian, with her husband and son having certain health issues and their need to take Chinese herbal medicine, her concern was to boil Chinese medicine for them. Unlike Western medication, these Chinese herbs need to be prepared and boiled into a soup daily. She said:

About one year ago or thereabout, suddenly my husband and my son have to see this TCM (traditional Chinese medicine), and have to boil those medicines. And I was the one responsible to boil those medicines, medication. So I used to wash the pots, the two medicinal pots, which are heavy.

When family members did not show they could do tasks for themselves, these women perceived even more strongly that their family needed to be taken care of. When Lillian was asked what would happen if she stopped boiling the medicine for them, she said, 'You don't boil, they don't drink.'

#### ***4.4.2.3 Quality time.***

Although housework was perceived as a means to provide the basic physical and health needs of the family, some women felt conflicted because the time needed to

complete these tasks took away quality time from them to spend with the family. Emily said:

Quality time with family is very important in the modern setup. Quality time with the husband, he comes back and your clothes are not being ironed, and you will very cross when he talks to you. You will get very cross, you know, why I don't have time, here he is wanting to talk to me and I need to get this done, you know.' Chloe also said, 'And then I will have less time ... because it weighs between whether you want to do housework or spending time with your family.

Lillian's husband finally dropped out of dancing classes because she could not attend, due to time taken up with housework tasks. As she stated:

He has to forgo. For a while, I couldn't dance, he danced alone ... He attended the classes and he danced by himself. He wanted to keep the program, but after two years I still can't get back so he dropped out also.

Emily also talked about how unhappy she was when she realised that ironing clothes interfered with quality time with her husband. She went on to say that she unfortunately had to put off her children when they tried to talk to her while she was doing housework, 'If you do the housework, you say don't disturb me, I am so busy, you know, I am busy cooking, I am busy ironing, so you miss the opportunities'.

Although the women felt strongly that it was their responsibility to provide a comfortable and clean home, as well as good and healthy food for their families through housework, they also valued quality time with their families.

#### ***4.4.2.4 Not to be burdened.***

All the women perceived that if their family members needed to participate in housework to an extent that interfered with their education and career, it became a burden to their family. As such, the women felt strongly about lifting this burden from

their family and they felt obligated to be personally involved in the majority of housework. This perception started to form early for Emily. She mentioned how she did all the housework when she was young, so no other siblings in the family were unhappy. She said, 'From very young, I learnt the mechanics of ... maintaining family harmony'. In fact, the family's negative attitudes towards involvement in housework strengthened the women's perception that housework was a burden to their families. Tiffany described her husband and children's responses when she asked them to help out in housework. She said, 'My husband, my sons, so they said "Don't have to clean, leave it there, just leave it". And my husband said "I need to rest, when I come back I need to rest so don't ask me to do housework"'.

Even when women considered housework a form of training, they did not subject their children to the major proportion of housework. They did not consider such a practice beneficial for their children. That Chloe tried to teach her daughter housework only during school holidays reflected this priority. She said:

Because she really ... nowadays the schoolwork is so heavy. For example, today or in fact this ... this ...whole week she is only home actually only Monday afternoon. Other than that she is back like five, six o' clock ... So it is very stressful to her, so I would think that all these things can hold. Because actually during her school holidays, I do ask her to do a bit of the housework like, for example, ironing if she doesn't know how to do it, I ask her, I teach her the steaming, so if she wants to go out, if she wants that t shirt then she has to do ... you know ... a bit ... independent. Or sometimes if I have to work late, then she has to cook lunch herself, a simple, very simple like instant noodle ... that kind of thing. Simple stuff I think ... because in the future I think she should be independent.



#### **4.4.3 Fulfilling personal needs.**

Although the women gave much priority to fulfilling their family needs through housework, they also cared about their own personal needs. Women with upper limb RSI in this study identified two major personal needs that could be fulfilled through housework before the occurrence of upper limb RSI. They were the need to be healthy and the need to feel good.

##### ***4.4.3.1 Own health.***

Housework in general was perceived as good for health in the form of a physical workout. Some considered housework could be good for their hands at the early stage of their condition when they first felt the pain. Yanny said:

If you just sit around, you will feel more tired and sleepy. If you do some household work and it makes you sweat. I think sweating is good for your health. It helps you to sweat out and you feel much better, that is why I think it is a form of exercise.

Lily also said, 'So that is part of the reason I am doing things like that, partly to strengthen my hands'.

Housework tasks, such as cooking and cleaning, perceived as a way to fulfill their family's health needs, were also considered by some women as good for their own health. Tiffany, who suffered from gastro-enteritis and irritable bowel syndrome, described how cooking was important to her health:

Irritable bowel problems, so when I have stomach problems, I know how to cook certain food that is suitable for me. For example, today I am sick, oh I just feel like eating porridge with certain dishes that I will crave so I can cook for myself. That helps.

Rosie, on the other hand, whose husband was allergic to dust, explained how important it was to have a clean house for her own health too. She said, ‘because I cannot tolerate dust, because on one hand I am also allergic to dust, got dust I will have sinuses’.

#### ***4.4.3.2 Feel good.***

The women felt good about themselves when they managed to actualise their housework meanings through performing housework or a particular housework task. When women experienced positive feelings or perceptions about themselves from doing housework or a particular housework task, it gave them a reason to do more housework.

Cindy expressed her satisfaction with the outcome of home cleaning, ‘When you see that it is clean and tidy, you will feel very satisfied’. Another participant, Lillian, discussed the process of cooking with a lot of animation. She explained that when she cooked dishes for her friends and family, she always cooked from scratch. She said, ‘either pound or I will sort of blend or what you call that ... minced them ... all the ... I will make it from scratch. Like I will do coconut milk not from coconut can’.

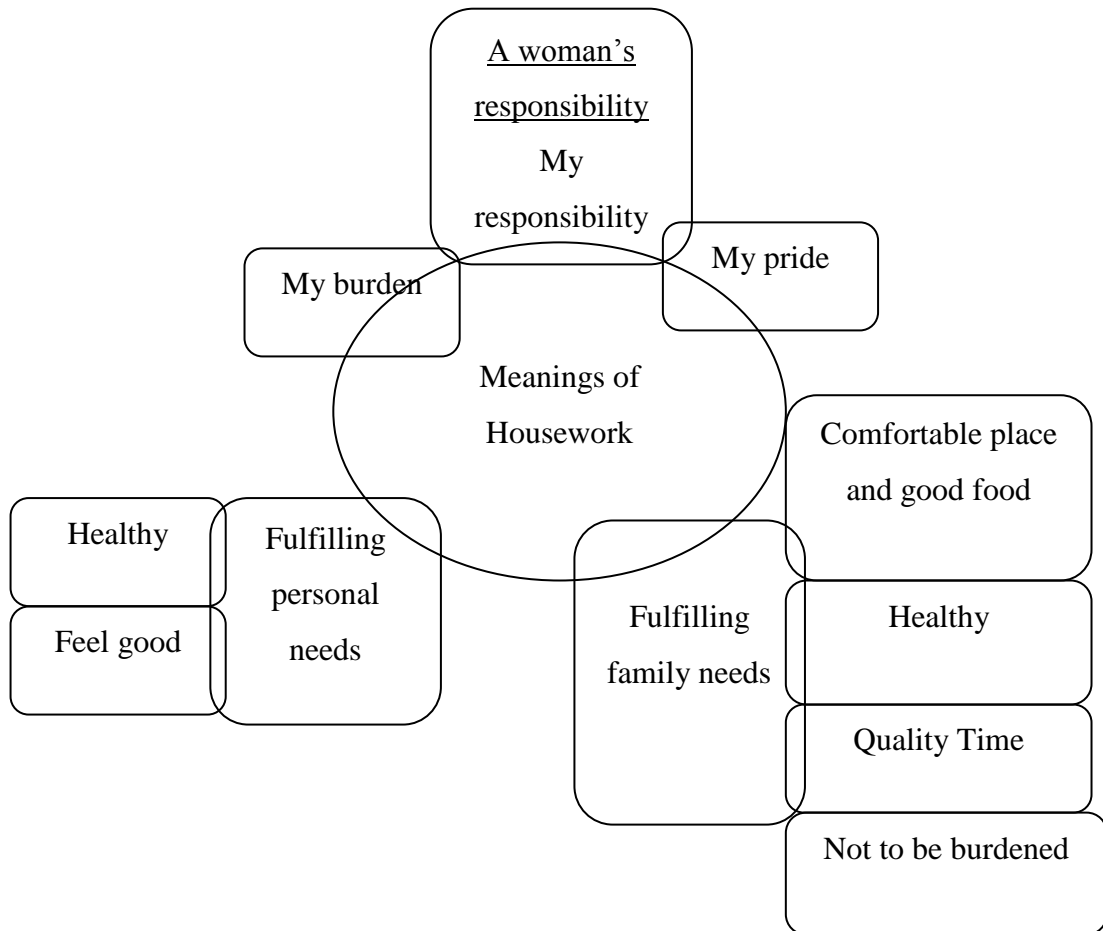


Figure 4.1. Women with upper limb RSI—personal meanings in housework.

#### 4.5 Developing Habits and Routines in Housework

When the women settled into their married lives, they started to develop and form patterns of housework habits and routines. They made decisions on housework methods and involvement and chose those that maintained a balance of family and personal harmony.

Family harmony referred to a harmonious relationship among all family members, a term introduced by Emily in her interview, 'Actually family harmony is somebody must manage the housework.' Personal harmony was achieved when a

participant felt 'good' about herself through managing the needs of the family, fulfilling her perceived domestic role and generating positive feelings within herself.

#### **4.5.1 Housework involvement.**

Most of the meanings the women attached to housework motivated them to increase their involvement in housework. Some women felt a strong desire to be personally involved in certain housework tasks, such as cooking and cleaning the house, because they felt these tasks could fulfil their family or personal needs. The only time the women thought about decreasing their involvement in housework was when they perceived housework as an obstacle to spending quality time with their families.

##### ***4.5.1.1 I choose to do as much as possible.***

Women who perceived housework as their responsibility tried to do as much housework as possible. Even those who had maids and did not need to do everything expressed that they still wanted to be involved in some housework. The extent of involvement in housework, or a specific housework task, varied with individuals. It depended on the family and personal needs specific to the individuals and whether a participant felt pride in doing a particular task.

Women who attached positive meanings to housework and did not perceive it as a form of training for their children did everything around the home. Silvia did not perceive housework as a form of training for her children and did not want to employ a maid (despite having the financial resources to do so). She said:

I like to do everything, I always multi-task, like when I iron my clothes I always watch my TV. I must be watching a certain TV program I like and then I, you know, yeah so I always multi-task you see.

Lily, who perceived housework as a form of training for children, chose to delegate housework to her children, but still did majority herself due to a sense of

responsibility. However, as she did not perceive housework as a source of pride, she had no particular desire to do everything herself. As she said:

It is just something that I have to do. Housework is something that I have to do and that's it. I would say that I ... if you ask me what I enjoy doing, I'd say I prefer to read.

When women perceived housework as a burden to the family, they would try to do everything around the home as much as possible.

Involvement in housework was associated with many positive meanings, enabling the women to feel good about doing housework. There was a certain self-image that the women needed to achieve and maintain through housework, which led to personal harmony.

#### ***4.5.1.2 I must do this task.***

Among all housework tasks, cooking and home cleaning were most often perceived by the women as requiring their personal involvement. Both tasks were perceived by all women as fulfilling the basic physical needs of their families. For some women, these tasks had to be carried out to a much higher standard than other families, to fulfil their specific family and personal health needs.

A task to which a woman attached positive meanings was usually a task she desired personal involvement in. Lillian, who considered cooking a source of pride, also expressed a strong desire for personal involvement in it. In contrast, Rosie who perceived housework as a burden after she became a homemaker and did not attach pride to any housework task, managed to put less emphasis on being personally involved. She expressed she did not mind buying takeaway food, 'But let's say if I feel too tired, then we will just buy back'. Alice, who stays with her son's family, needs to

clean the floor frequently because of her baby granddaughter. She took her personal involvement in floor cleaning seriously:

when I am taking care of my granddaughter. Every day I have to sweep the floor ... every day I mop the floor ... before that, it is only sweep the floor is about alternate day or maybe I mop the floor twice a week.

#### **4.5.2 Housework methods.**

The choice of housework methods depends on the personal and family needs perceived as important by the women. It also depends on whether a participant feels pride about a specific housework task achieved by using a particular method.

##### ***4.5.2.1 I choose a fast method.***

The time spent on housework was also considered as taking away quality time spent with their families. Most women without a maid to help with housework, tried to meet these needs by doing housework quickly. The need to do housework quickly was often emphasised by these women. These are just a few examples: Silvia said, 'And basically I am quite a fast worker I would say, yes, so I can handle the whole ... everything all at one go'. Lillian said, 'I have to do it fast and quick'. Mandy also said, 'I just did it fast ... Has to be fast'. Another participant Emily even compared her speed in housework with her maid, 'But I can move I think five times as fast and I see that she is not able to cope'.

##### ***4.5.2.2 I choose a good method.***

In deciding whether a certain method of housework was good, women in the study considered whether it would meet a certain standard. They chose a housework method that could achieve a standard they considered superior. Most women in this study had expectations of the standards required for certain domestic tasks.

Cindy, who took pride in the cleanliness of the house, said:

But I still feel that it is not clean so I still use bucket and cloth and squat down to clean the floor. So when the children do it, I feel that it is not clean enough. Then later on I will clean it again.

Rosie, who has a sinus problem due to her allergic reactions to dust, also believed that using a cloth to squat down was the best way to clean the floor. She perceived that in this way the floor would be clean: she would experience relief of her sinus symptoms up to nearly two weeks with that method, 'Because by doing that actually the house is much cleaner, it lasts you one to two weeks, very clean all the while'.

#### **4.6 Interpreting the Experience of Pain**

The experience of pain as a result of upper limb RSI signified the start of a series of decisions in relation to housework activities and routines. All women reported experiences of pain while doing certain housework tasks. The presence of pain at the initial stage of their conditions did not automatically lead to a perception that the pain was related to housework. When the women did not relate their pain to housework, they consequently could not understand why they should change the method or frequency of doing housework. Although women did not make any decisions towards a change in housework at this stage, the experience of pain was critical in initiating the series of cognitive and emotional decisions that followed.

##### **4.6.1 I didn't feel the pain.**

Some women became aware of pain only when they consulted health professionals for other health issues. Emily tried to explain why she ignored the pain. She said, 'I think you have got to overcome many things ah. You can live as if it is painful here and there. You won't do it'. For Emily, this strategy of trying to ignore the

pain protected her sense of personal harmony by allowing her to carry on with the housework tasks she wanted to do.

#### **4.6.2 I felt the pain ... but not during housework.**

Most women reported they felt pain at the early stage of their condition. However, when pain was not felt during housework or immediately after, they did not relate their pain to housework. Lily, who experienced the first episode of pain at night (not when she was doing housework), said:

What actually happened was one night when I was sleeping and suddenly I stretched and I felt the snap in my thumb. I have to pull it back. It is like very sharp pain that was in the middle of the night. So subsequently after that, once in a while, I think once in a few days it will snap. Then I will pull it back.

The circumstances of this initial pain experience due to her condition did not impress on Lily there could be a link between housework and pain. She then went on to explain why she interpreted the subsequent painful experience in the hands while doing housework as a kind of exercise pain. She said:

Because I have this impression that if I exercise my hands I will strengthen it. So that is part of the reason I am doing things like that, partly to strengthen my hand ... I thought that was part of the conditioning process, you know. Sometimes we go for exercises we will get aches and pains but it is part of building up the muscles.

In fact, it was common for women with upper limb RSI conditions to be aware of their pain only at the end of the day, when they had finished all housework. Karen, who cooked for the whole family on Sundays, commented, 'I feel pain at the end of the day on Sundays'.



#### **4.6.3 I felt the pain ... it is not serious.**

Most women expressed that they denied or did not bother with the pain as they did not think it was anything serious. Women who had experienced more serious illness previously tended not to take the RSI pain seriously. Tammy, who has cancer, did not interpret pain from upper limb RSI as something serious until the pain got worse. She said, 'I don't take it that seriously until now' Karen also explained why she was not too concerned about pain in her hands, forgetting to follow therapists' advice regarding housework 'because it is not a life threatening condition'. Most women in the study did not interpret their pain as something requiring change in their usual domestic routine.

#### **4.6.4 I am just getting old, it is normal.**

Older women tended to interpret their pain as part of the ageing process. Karen, who was 76 years old at the time of the interview, felt pain only at the end of the day and said, 'Ageing already, so that will happen'. Yanny also said, 'I say as you age, then here pain there pain, not only the joint pain, it seems that the joint, I mean all the joints start to get pain'.

#### **4.6.5 I don't want to think that this pain means I need to cut down my housework.**

Women were more ready to generalise past pain experiences to their current conditions of RSI if those past experiences did not result in a lesser amount of housework. Emily explained her personal philosophy of how she interpreted pain. She said:

You can live as if ... it is painful here and there. You won't do it. Once, I experienced that, I have a frozen shoulder, because it was painful so every time I will not use my arm, you know ... and I found that it is already frozen you

know. This muscle that I have not been flexing because of the slight pain, so now I don't, I just go ahead and do it.

Emily generalised her previous experience with frozen shoulder to her present condition of upper limb RSI, and interpreted the presence of pain as a sign that she should move or use her hands more. With this interpretation, she continued to carry out her daily housework routines. Other women, who had experienced spontaneous recovery from pain before, also generalised this experience to their upper limb RSI conditions. Tiffany talked about how she perceived her experience of pain in the hands, 'I thought may be just sprain, so I didn't really bother it'.

Those women who had past experiences of RSI conditions in other locations, and had been taught to make changes in housework, were not able to generalise these experiences to their current condition; therefore, they did not consider cutting down or making changes to their housework. Lillian and Tammy were among the two women who had other RSI conditions previously. They reported they tried not to think about the pain when they initially experienced it at an early stage of their current RSI condition. Lillian said, 'the more I think it is nothing ... nothing ... and then one day you cannot' Tammy said, 'but I thought that it is just the elbow will get problems but then well I didn't bother ... now it is the fingers'.

#### **4.7 Interpreting Health Professionals' Advice**

When the women consulted health professionals for their condition, they received advice regarding changes to housework. From the women's accounts, the advice they received from therapists could be mainly categorised into: i) minimise their involvement in housework; ii) change their housework methods with or without labour saving devices. The women then began to interpret their pain experiences in terms of

these two recommendations, and began considering whether a change in housework was necessary, possible and acceptable.

#### **4.7.1 Are the changes necessary? My pain experience.**

All women in this study received education from therapists regarding the presence of pain and its relationship to housework. When they compared advice from the therapists with their own experiences of pain, all perceived a connection between pain and housework. Once they were able to relate their pain to housework and understood that a change in housework could manage the biomechanical strain imposed on their upper limbs, and consequently their pain, they started to consider being more careful in their housework activities. Silvia said, ‘what I mean is I don’t know what contributed to the pain. So now that I have been told what can contribute to the pain, it reminds me to be careful’.

##### ***4.7.1.1 I didn’t feel it until she pressed it.***

All participants reported it was their pain experience that led them to consult health professionals. However, for some participants, it was only upon consultation that they started to notice pain spots of which they were not previously aware. One particular participant Emily reported she only realised the presence of pain in certain areas of her upper limbs when the therapists palpated them.

She said, ‘there may be pain but actually until she pressed it, I didn’t realize that there was pain there too you know’. On reflection, she expressed her high pain tolerance, ‘I can endure a lot of pain, that is why I never really know it is that bad’, and her decision to ignore it, ‘the thing of pain is that if you don’t think of it, it will not be there such’, were the two main reasons for this situation.

#### ***4.7.1.2 She told me the possible consequences.***

Some women were alerted to the seriousness of their conditions by their therapists, enabling them to realise they should attend to their pain. Theresa talked about how the therapist tried to impress on her the consequence on her conditions if she continued to overuse her hands by hand washing her clothes: ‘she said that the fingers cannot be changed, washing machine can be changed to a new one’. And, ‘she told me that later my fingers may get even worse (if I didn’t change)’. Theresa then compared her own experience with the therapist’s advice, ‘because I can see that when I grip, there is problem already and I know that go on like this, one day I won’t be able to make a full grip’. As her personal experience was consistent with the therapist’s advice, she interpreted the therapist’s advice as reasonable, ‘I feel it is reasonable so I will listen’.

#### ***4.7.1.3 I experienced pain relief with changes.***

After the women had been educated on the relationship between pain in their upper limbs and housework, and had experienced pain relief with changes to housework, they started to make a clearer link between the two. Cindy said:

Last year, when my younger daughter was at home, the home is a bit more messy and dirty. Then last year December, she went to England for a holiday for three weeks. So for those three weeks, I comparatively didn’t need to do that much. Then, after December ... after Christmas when she came back, because of just one person more, because she is quite messy, so I did more again and it became painful.

The women’s own experience of pain guided them to consider the advice they were given. When they received conflicting advice given by doctors and therapists, the

advice that was consistent with the women's own experience was more readily taken.

Participant Chloe commented on her experience with conflicting advice:

He said, 'After the operation ... two weeks' ... he said, 'continue to do the housework as per normal'. And the therapist told me no, and tried to cut down. And again I get conflicting advice.

Then she made a decision on decreasing her involvement in housework, based on her experience:

I tried but it can't be as per normal. Hmm ... because it is not easy to do with this ... So that is the time when I cut down the housework and my husband chip in a bit.

#### **4.7.2 Are the changes necessary? Other people's pain experiences.**

Women's knowledge of their friends' or families' experiences was sometimes more powerful than the advice given by therapists. Contrary to what she was advised by the therapist, Cindy perceived that surgery and alternative medicines could improve her condition in the future if it got worse; she had heard all her friends recovered well from their surgeries for similar conditions. She said, 'very well, I asked them if there were relapses, they all said okay, five to six years already and all is still fine'. She also believed that the condition was not difficult to manage, as she had heard from others how their conditions recovered with alternative methods. She said:

Then the most interesting thing is in the grocery store downstairs, the boss has the same pain as mine. After the finger bent, it could not go up, like what I have. She said she used the bandage to wrap it and do work. Because it would be painful if the finger suddenly pop up. She said she didn't take care of it for one whole year. Then she also used the medicated oil to rub it every night. She said after one year plus, nothing already. She can flex it and extend it.

In contrast, observation of the serious effect of illness from a close family member could encourage consideration of the consequence of one's own conditions. Lillian, who observed her mother suffering from another illness, considered the advice from the therapists as reasonable. She said:

Okay, basically I am not afraid for myself, I am afraid of ... in future what happens to me. If I don't take care of myself and do modification, then in the future if I become a burden, who looks after me? It is only my husband. My two kids will be away. I mean they will be married and gone. My daughter is going to Australia; my son probably will get married. But then son la, you cannot expect very much. And then my husband is already my age, so it is more like ... look after yourself so don't give others burden la. So I supposed that is the reason that drives me.

Lillian also noted that, 'because I take care of own parents I know, how terrible it is to be a care giver'.

#### **4.7.3 Are the changes possible? My family's attitudes.**

The family's attitude played an important part in how the women interpreted advice, in particular regarding delegating housework. When the family's attitudes were negative towards helping out with housework, the women expressed a sense of helplessness when they were told by the therapists to reduce their housework.

Women with family members who were not used to doing housework before they were diagnosed with upper limb RSI found it more difficult to decrease their involvement in housework. Lillian struggled with the advice to decrease involvement in housework:

my issue is I don't know how to carry out. Say, don't do this and do less of this. How not to do housework as I am one person in the house? You know that sort of feelings.

Other women, such as Theresa and Lily whose families already helped out with housework, found the advice to cut down housework possible.

#### **4.7.4 Are the changes possible? My financial resources.**

Whether advice from therapists or doctors was considered practical also depended on the women's perceptions of their financial resources. Cindy, who received advice from the doctors to employ a maid to help with housework said:

He said, 'So try your best to get maids to help you doing housework'. I said, 'My financial situation wouldn't allow me to employ a maid, we have to be maids ourselves'.

When she was asked why she didn't follow the therapist's advice to purchase ergonomically friendly bottles, she said, 'because we have been using these things for decades. How to replace everything? So I sometimes just ask my children to help when I cannot open'. Cindy considered the advice from the health professionals during her therapy sessions impractical, and expressed her negative feelings towards health professionals, describing their advice as 'commercialized'. She said, 'I feel that it is quite commercialized.' However, later on during the interview when she found out that the bottles only cost two Singapore dollars each, she commented, 'yes, I thought it was expensive. If I know it is only two dollars, I will consider buying to try and I may even share with my friends'. This shows the importance of clearly explaining the financial costs of change during education, and its effect on these women's decisions to change.

In contrast, women with sufficient financial resources would interpret therapists' advice—such as 'be careful with what you do in housework'—as a reason to employ a

maid. Tammy said, 'that is why I have to quickly get a maid and help out because I can't be continuing with the housework'.

#### **4.7.5 Are the changes acceptable? My habits and routine in housework.**

Certain advice regarding housework was not interpreted as practical. It would not be considered if the women found it difficult to fit into their developed habits and routines. Lily talked about the advice on enlarging cutlery handles as impractical because she found it difficult to keep them clean. She said:

Yeah ... if I were to use it, I have to make sure that it is washed constantly and doesn't get dirty, you know what I mean? If I were to fit it to cutlery and all that, it will get dirty from food and things like that.

Silvia, who took pride in her housework efficiency, considered it unacceptable to split her ironing into a few loads and pace herself, as it was contradictory to her valued 'efficient' routine:

Oh no, no, but it won't be what you call 'efficient' to go and you know split the thing out, basically you need to switch the thing out and the iron needs to get heated up right?

#### **4.7.6 Are the changes acceptable? My housework meanings.**

As described earlier, when women became homemakers after marriage, they perceived housework as their responsibility, a source of pride and a way of fulfilling family and personal needs. Although some women perceived housework as a burden when they were young, most did not still have this perception when they became homemakers for their own families.

For these women, to fulfil a sense of personal harmony was important. It affected how they made housework-related decisions. When making a change to housework resulted in women feeling no longer fulfilled their responsibilities as a



homemaker, compromised their ability to do housework to an acceptable standard, and upset family harmony, they would feel bad about themselves. This disrupted their personal harmony. Tammy noted how she did not feel good about herself with the maid doing all the housework:

Now my house so clean is not myself, it is my maid doing it so I can't tell people ... people can't come wow you ... because it is not done by me you see. It is done by the maid.

Cindy, who took pride in the cleanliness of the house, struggled to do the cleaning even when she had pain. She said, 'I still feel that what they do is still not up to my standard'.

## **4.8 A Conceptual Framework of Decision Making to Change**

### **Housework**

A conceptual framework on the decision making processes of the participants was constructed, based on the themes and subthemes from the interview data as described above (see Figure 4.2).

#### **4.8.1 Emotional attachment to housework.**

Women with upper limb RSI started to attach meanings to housework and housework tasks once they had observed or participated in housework when they were young. The forming and shaping of these meanings continued with the change of roles in housework through marriage. There are many positive meanings that women attach to housework. They consider it a pride, and an important task to be performed to fulfill their responsibilities as a woman, at the same time fulfilling their own needs and their family's needs. Among all these meanings, only two negative meanings related to housework were identified. When the performance of housework requires skills and capacities that are beyond the women's abilities, they perceive it as a burden. Also,

when the performance of housework comprises the quality time they could have with their family, they would also consider it as undesirable. As the women attached more positive meanings to housework, they also started to feel more strongly about these meanings and developed their habits and routines based on them. They made decisions on how much they should involve themselves in housework and what methods they should use to do it. Although different women attached different meanings to housework tasks, most women perceived that housework needed to be done speedily and to a high standard. Based on these standards, housework was then carried out repeatedly. Over time it became a habit and routine, forming part of their self-identity. When this self-identity was threatened, the balance between personal harmony and family harmony could also be threatened. This was a dynamic process in which the women continued to adjust their housework involvement and methods to ensure that housework routines maintained a balance in their family and personal harmony.

These habits and routines were usually difficult to change. Participant Mandy expressed her thoughts well on this, 'It is not they don't want to change. It is just that for human beings they have a circle inside their brain ... some habits'. This circle was like an imprint of housework habits and routine that the women had developed over years. In this circle, there were the deeply formed housework meanings, the fulfilment of women's own needs and also their families' needs. To the women, their housework habits and routines had become a set of reflexes that were essential for both their own and their families' wellbeing. They had become part of their self-identity, resulting in a deep emotional attachment to housework.

#### **4.8.2 Cognitively informed decision vs. emotional decision.**

With the occurrence of upper limb RSI, women started to experience pain. During the initial stage of pain, none of the women perceived a link between their pain

and housework. Without advice from health professionals, and influenced by their strong emotional attachment to established housework habits and routines, all the women tended to interpret their pain either as a sign to do more housework, or as nothing serious that should interfere with their regular housework routines.

When the women received advice from health professionals, they started to experience their role as a client in a hospital and were required to make a series of cognitively informed decisions. They weighed their options and started to make decisions about whether a change in housework was really necessary by considering their own pain experience, their knowledge of other people's experiences and advice from health professionals. They also considered if the specific changes advised by OT were possible. They made decisions on the possibility of these changes by considering whether their families' attitudes and their current financial resources could support the changes. Even when the women made a cognitively informed decision that changes were necessary to manage their conditions, and that specific changes were possible to implement, they did not necessarily accept these changes emotionally. They would struggle with whether the changes were acceptable at an emotional level.

Habits and routines that fulfilled the meanings of housework perceived by the women have three main characteristics: personal involvement, efficiency and high standards. Advice on housework given by the therapists includes two common suggestions: to decrease involvement in housework; and to make changes to their housework. Most often, the women would also be advised to do housework slowly and to accept lower standards. Thus, the advice was understandably perceived by the women as the opposite of what they wanted and expected from housework, threatening their self-identity and emotional attachment to established habits and routines. Participant Mandy encapsulated it when she was asked why she could not stop doing

some of the housework even though she had a maid: 'Then I won't feel happy, I become an invalid.' To Mandy, being able to do housework as normal represented her self-identity: a representation of herself as able bodied. As such, even though the women considered certain changes in housework were necessary and possible, most still struggled emotionally to accept these changes. This resulted in less enthusiasm to carry out the changes in the long run.

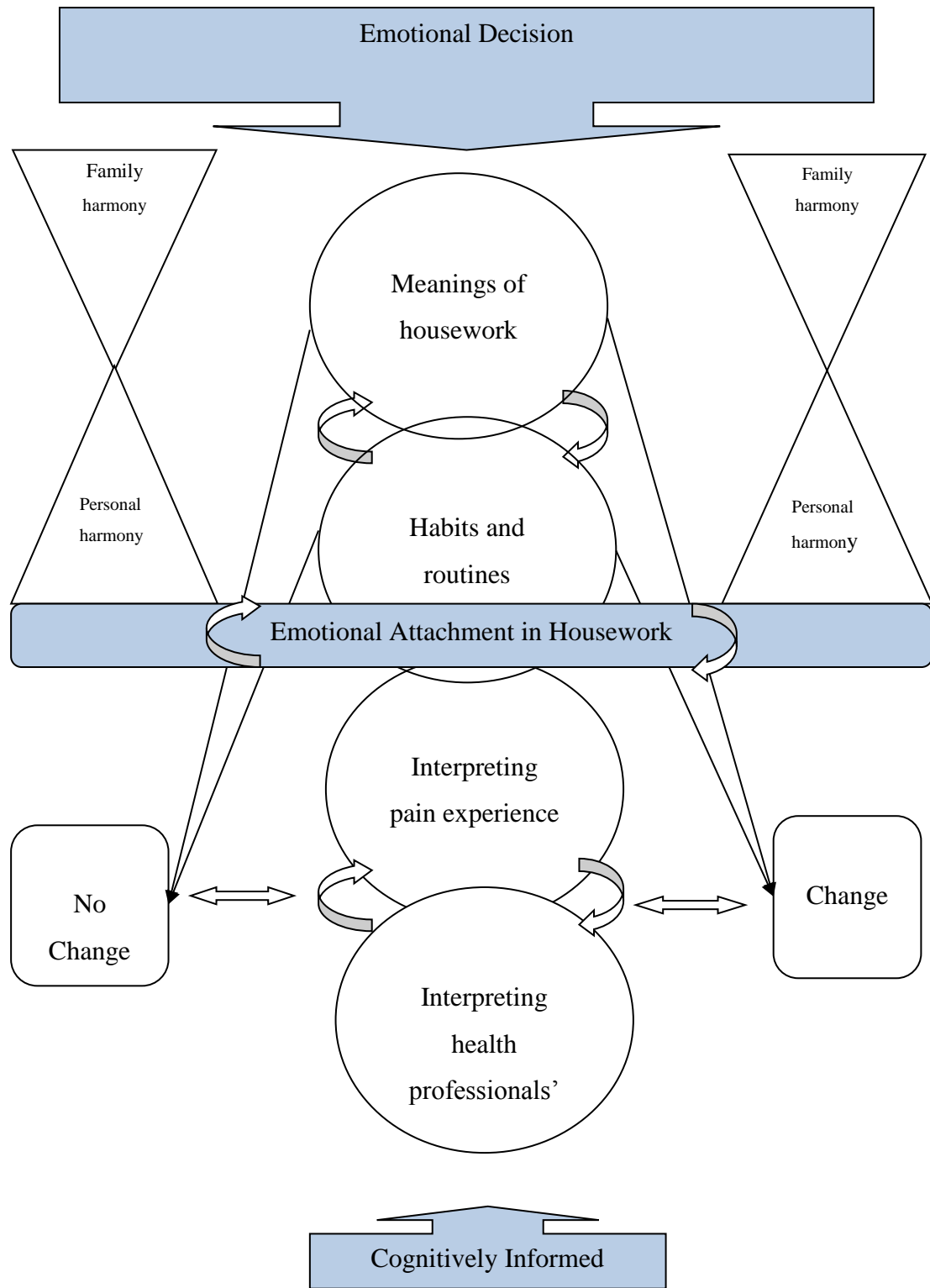


Figure 4.2. A conceptual framework of women’s decision making to change housework activities and routines.

## **4.9 A Conceptual Framework of Women's Decision Making in**

### **Housework: Illustration with Two Case Studies**

Women with upper limb RSI had to make a series of cognitive decisions for or against a change in housework to manage their condition. They made these decisions by weighing the options, based on their personal understanding and interpretation of their own pain experience and advice from health professionals. However, the women's cognitively informed decisions in this context were shaped by their emotional attachment to housework. This attachment was based on personal understandings and experience of housework meanings and routines within their cultural context.

On the continuum of change in housework, the extent of change made by each participant varied. This depended on interaction between the emotional affect of each participant's perception of housework meanings and routines before upper limb RSI, with their cognitive interpretation of pain experiences and interpretation of health professionals' advice after upper limb RSI. Two women's stories were chosen to illustrate this dynamic. While Emily represents most women in this study who expressed strong attachment to their housework habits and routines, Theresa represents a group who did not attach too much meaning to their housework and were willing to comply with all ergonomic recommendations made by health professionals. These two women illustrate the framework; they represent the two extremes of the behaviour change in housework continuum.

#### **4.9.1 Case study one—Emily.**

Emily lived with her husband, her eldest son and two full time maids. Her youngest son lived with his wife and children overseas. Emily's husband had a stroke a few months ago; as such, she had employed two maids to help take care of her husband and to assist with housework.

Emily began doing housework before she was ten years old. She perceived housework as a woman's responsibility through observing her mother when she was young. She identified with her mother's character and role in housework: 'It is still my mother, but so ... I was very close to her because she is ... like me. She will do everything you know'. As Emily started housework early in her life and participated in housework perceived as 'hard work', she felt the burden of housework. She described the period when she did not need to do housework as a time of 'freedom'. She also felt pride related to housework early in life, as she reflected on how doing housework gave her multi-tasking skills.

Consistent with most women in this study, after marriage Emily considered housework as her responsibility. She took pride in her capability in managing all housework tasks efficiently. At one point in the interview, she mentioned she did the ironing quietly when the maid was taking a nap, as she considered she was better than her maid, 'I mean, I can take it, she cannot take it'.

Emily also perceived that by participating in housework, she contributed to family harmony by freeing others from its burden. She perceived it was unfair to burden her sons with housework, although she agreed that certain housework tasks could be used as training: 'Not fair to them. You can teach them and asked them to help out when they are free but not fair to put the responsibility on them'. As such, she did not ask them for help even when she felt pain when doing housework tasks.

Emily considered cooking as her personal service to the family by providing them with good food, bonding the family together:

you want to cook, I think, special meals for the children ... you should do it yourself. Like special meals for my husband, I will do myself, I can teach the maid but the taste is not there also so I do myself.

She believed that cooking enabled the family to sit together to eat and served as a bonding factor. She also attached strong pride to this task:

so a lot of people asked me, write down your recipe. I said when I don't want to use them anymore, I will write down ... because seriously I would like to pass it on. I have gotten them all in the computer system.

Since Emily's husband had a stroke, cooking became even more important. Emily mentioned how she cooked special meals for her husband and then she said, 'That is how I rehabilitate him in every aspect'.

Although Emily perceived housework as a good way to provide service for the family, she also perceived spending too much time on it would reduce opportunities to spend quality time with them. Obviously, the only way to achieve both would be to choose housework methods that were fast and good. She admitted that her standard in housework was high, 'I am very fussy. I am very fussy about housework'. At the same time, she valued speed in housework. She talked about how much faster she was in housework compared to her maid. She also mentioned what she looked for in housework methods, 'you can do very fast and you can do it very fast and do it very efficiently'.

Throughout the interview, Emily revealed struggles in her interpretation of her pain experience. Although she clearly related her pain with housework throughout the interview, when asked if she asked others for help in housework, or tried to do less housework when she felt pain in her hands, she responded by denying her pain experience: 'But it doesn't matter; you don't think about it, it is not painful'.

Emily's domestic habits and routines were influenced strongly by the meanings that she attached to housework, which acted as a strong counterforce to certain health



advice. As her routines revealed a strong desire to be involved in housework, any advice that suggested decreased involvement in housework was strongly resisted.

Although she perceived the advice to change certain housework methods as more viable if they imposed less threat to her habits and routines, only housework methods that did not threaten the meanings she attached to housework were perceived as acceptable. As such, only housework methods that provided a way to protect her hands and achieve a high standard of efficiency—fast and good—would be readily accepted. For example, she readily accepted the use of a new mop when she observed how efficient it was, declaring that it helped with her condition, ‘and that helps, you can do very fast and you can do it very fast and do it very efficiently’.

#### **4.9.2 Case study two—Theresa.**

Theresa lived with her husband and a daughter. Her daughter travelled frequently because of her job. Theresa had two married sons with children and they lived in their own homes.

Theresa started to do housework before she was ten years old. As her mother’s health deteriorated with frequent childbirth, Theresa became responsible for even more housework tasks. When she was young, she perceived housework as a burden that she had no control over, ‘no choice, just do it, there is really no choice’. She resented it, ‘I hate it to the core. I hate it. I have a fall and still get beaten up by my mum; I tell you. So I hate it’.

This attitude towards housework changed after Theresa was married, ‘After I got married, it became more relaxing as it is my own home’. She even expressed happiness doing housework for her children. Although Theresa considered housework a service to the children, she considered it necessary only when they were young. When asked about the meaning of housework, Theresa said: ‘Not much, just my family, and

something that I should do, my children ... so just to take care of them till they grow up'.

As Theresa also felt no particular pride in housework or any housework task, neither did she feel a strong need to be personally involved in housework. As such, delegation of housework tasks to her husband and her older children was always part of her domestic routine:

And my husband has been mopping the floor ... all by himself ... When my children were up to junior college, secondary school, they washed the clothes themselves. My sons helped in washing.

Theresa is an example of someone who did not relate housework to her personal needs in a positive way as most women in this study did. In her situation, her personal harmony and family harmony were still very well preserved, with housework routines that demanded minimal involvement.

Theresa experienced pain from doing housework when she was young:

All in all I have six younger brothers and sisters. So in the end I washed clothes for ten persons. I still have an Uncle. So I have been twisting my fingers a lot, wash cups etc. ... then very painful already and continue on ... When I was young, sometimes I felt the pain.

This perception gave her no clear link between her present condition of upper limb RSI and housework. She described what she felt when she first experienced RSI pain in her hands, 'just may be thought that the fingers are tired'. Only when she started to experience more pain later on did she relate the pain and the deformity in her hands with housework:

I looked at my hands and also noticed that when I did more things I started to get more pain. I also wondered why the fingers get more and more deformed.

She maintained throughout the interview that too much housework caused her current RSI condition.

For Theresa, her family have always been supportive in helping out with housework: 'if I push too many times my elbow will get pain, then I told my husband and he didn't let me do it anymore'. Her financial resources were also sufficient for her to purchase various housework assistive devices that she needed:

the therapist told me to buy the tool to open can etc. bottles. The rubber, those you put in the car, also when I opened milk and stuff I used the spoon to do it instead of using my hands to press ... Yes, that was also bought by my daughter in law. She also bought the spoons.

As Theresa perceived her own experience of pain as consistent with what the therapists told her, 'I changed my way and to enlarge the handle and no pain now', she followed all the recommendations related to housework given by the therapist. She changed her housework methods 'Now, I don't care already. Just use the washing machine'. She also decreased her involvement in housework, 'I don't do much now. Just to cook a meal once in a while', something that most women in this study found difficult to achieve.

#### **4.9.3 Comparing Emily and Theresa.**

Both Emily and Theresa started housework when they were very young and perceived housework as difficult for them in those days. However, there was a difference between the two, and that was their attitude towards housework. Emily identified herself with her mother. In her housework experience, she went through a process of resentment towards housework, and finally self-reflection on her skills in housework, arriving at the meaning of 'pride'. Theresa remained at the stage of resentment towards housework and her mother, taking no particular pride in it.

As Emily perceived a strong positive perspective of housework meanings that required her personal involvement in housework with efficiency, her housework habits and routines became a counterforce to her receptivity to therapists' advice. Even when she cognitively decided that a change in housework was necessary and possible, she still found difficulty in accepting certain changes at an emotional level. This led to a strong desire to be involved in housework and maintaining her role with it. As such, despite sufficient financial resources to employ two maids, no obvious negative family attitudes against housework participation and an experience that related pain with housework, she still found it difficult to do no housework at all; at times she even competed with her maids. In contrast, Theresa perceived no such meanings that required her to be personally involved and efficient regarding housework. Her housework habits and routines, financial resources, family attitudes and own experience of pain all supported the change advised by therapists. As a result, she did not experience strong emotional barriers to making changes.

While Emily found it difficult to follow any advice on decreased involvement in housework, Theresa followed the advice readily. While Emily was willing to change only certain housework methods using technology, due to her high standards for housework, Theresa had no problems in changing any housework method that could help to manage her RSI. Different strategies were thus needed in ergonomics education on housework to facilitate changes for Emily and Theresa due to these differences.

#### **4.10 Discussion**

The findings from this study showed that decision making to change housework activities and routines was both a cognitive and emotional process. The emotional effect of a change that challenged a woman's self-identity in housework was a strong barrier to her decision to make a change in housework, according to health professionals'

advice. Social psychology terms this resistance to persuasion as ‘psychological reactance’ (Rains & Turner, 2007, p. 241).

When an individual's perceived freedom to engage in a specific action, belief, or emotion is threatened, that individual enters a motivational state directed toward re-establishing that freedom - a state of psychological reactance. (Brehm, 1983, p. 471)

For the women in this study, the threat to them was their freedom to do housework, or certain housework tasks, according to their pre-established routines. According to social identity theory, a person's social roles form the basis for his or her identity (Thoits, 1997). For most women in this study, the social role under threat was that of homemaker. The present study found that the role of ‘homemaker’ meant different things to these women, as reflected in their perceived meanings of housework. Despite these differences, the majority expressed a common attachment to their individual housework habits and routines.

#### **4.10.1 Meanings of housework.**

The housework tasks mentioned by women in this study were similar to the traditional feminine activities reported by Kroska (2003), in her study on the gendered meanings of household chores. These include childcare, grocery shopping, meal preparation, washing dishes, house cleaning and laundry.

The meaning of housework as a woman's responsibility perceived by the women in the present study is not new. Several recent studies have reflected that housework as a woman's job is still a societal norm (Altschuler, 2004; Brickell, 2011; Neuhaus, 2011). Neuhaus's study found that women had been consistently the focus of American housework advertisements since the 1950s, regardless of changes in their images as portrayed through different eras. Some women in the present study described

the concept of housework as a woman's responsibility with the phrase 'part and parcel of life'. This corresponds to the description of housework as 'a process of life' by an older woman in 53 ethnically and economically diverse women (55–84 years old) from the Greater Los Angeles Area in US in a qualitative study (Altschuler, 2004).

In the present study, the meaning of housework as a woman's responsibility was formed through beliefs in the women's immediate community (mothers, grandmothers, other family members). Based on data from a 31-year panel study on white mothers and children from a US Detroit metropolitan area, the study by Cunningham (2001) also showed the important influence of parental attitudes and behaviours on children's gendered housework behaviours in their adult lives.

Housework as a woman's responsibility has remained a contemporary societal norm, and is reflected in women's major participation in housework in many countries (Knudsen & Waerness, 2008). Despite this, women do not necessarily carry out more housework in the home just because of gender influence through socialisation. The change of roles with a change in marital status was one factor that influenced the attitudes of women in the present study to have a greater involvement in and commitment to housework. A study by South and Spitze (1994) on housework division, with data from a national survey in the US, also found that a bigger gender gap in housework involvement was observed in marital households than non-marital households (cohabitants, never-married, divorcees, widows). When the women in the present study got married and observed that family members were unwilling to participate in housework (perceiving it as a burden) they tended to do all the housework. A study by Brickell (2011) on women in Cambodia found that two perceptions drove these women to absorb the majority of housework responsibilities in

the home. First, they perceived that men were unwilling to help. Second, they felt that by performing housework tasks, they could ensure the survival of their marriages.

A different mixture of positive and negative housework meanings were expressed by each woman in this study, both in the role of homemaker and in specific housework tasks. This is consistent with Shaw's (1988) suggestion in her background review for an interview study with 60 married couples. She observed that while a number of studies reported negative housework meanings, emphasising it as hard work (Gavron, 1983; Oakley, 1974a), other studies reported positive meanings, emphasising pleasure and satisfaction (Kome, 1982; Lopata, 1971). These results show the variations of meanings that could be perceived by an individual woman.

In the present study, cooking and cleaning were the most frequently mentioned tasks that gave the women a sense of pride and pleasure. In the study by Shaw (1988), she found that each woman attached different meanings to individual housework tasks (work, mixed work and leisure, leisure), with cooking and child care being the top two housework tasks regarded as leisure by most women. The reason that child care was not mentioned much by women in the present study could be the older age range of the women as compared to those in Shaw's study. In Shaw's study, the age range of the couples was 21–62, with a mean age of 39.6; in the present study, the age range of the women was 47–71 years, with a mean age of 58.5 years (SD 8.3). Also, in the present study, only one participant needed to take care of a young child (a granddaughter aged 3) at the time of the interview. In a more recent study by Poortman and Van Der Lippe (2009) with 732 couples, cooking, cleaning and child care were found to be the three tasks most favoured by women. Although Poortman and Van Der Lippe did not specify the age range of the couples and their children, they reported that out of 732 couples included in the study, 378 had children at home. Nevertheless, the importance of

cooking and cleaning, as two of the top housework tasks regarded by the women in the present study, is also evident in these other studies.

Some housework meanings can change with age and the life stages of a woman, especially tasks related to child care. Other housework meanings were felt more deeply when women stepped into the role of a homemaker after having a family. The present study found that women attached increased importance to housework or particular housework tasks when they had their own families. Some tasks remained important throughout all stages of life, even with ageing. Cleaning and cooking were two tasks that remained important among the older women in the present study. Findings from other studies demonstrated consistency with these results. A study by Robinson and Milkie (1998) found that a majority of the older women (64%) in the age group above 50 years old still reported they felt good about cleaning their houses. In a qualitative study conducted by Gustafsson, Andersson, Andersson, Fjellstrom, and Sidenvall (2003), with 159 nondisabled women and 73 disabled women, they found that nondisabled women valued and took pleasure in cooking, most often preparing dishes from fresh ingredients; and disabled women perceived the task as symbolising independence, and strived to continue with it despite difficulties. This is consistent with the perception of cooking by the oldest participant, Karen, in the present study. She valued and took pleasure in weekend cooking for her family, despite her pain.

In fact, most women in the present study still perceived that housework was important even when they had become older. This differed from the findings in a qualitative study by Altschuler (2004). Altschuler found that women in her study perceived housework as less important as they aged, either because they had adopted an expanded philosophical perspective about what was important in life, or they had been living under frustrating circumstances (i.e. alcoholic spouse, abusive spouse, unhappy



marriage). In the present study, only Theresa explicitly expressed an expanded philosophical perspective regarding housework after upper limb RSI, perceiving it as less important than previously. Most women in the present study continued to attach great importance to housework and only expressed frustrations when they could not do it as they used to. The difference in findings could be due to the women's different social, cultural and life circumstances, with none in the present study living under circumstances such as those described in Altschuler's study.

In the present study, most women attached positive health related meanings to housework and perceived that housework was beneficial before the occurrence of upper limb RSI. A study that investigated women's beliefs on exercises and coronary heart disease also found that women believed the physical activities inherent in their domestic lives, such as daily participation in housework, prevented coronary heart disease (Clayton & Ruston, 2003). This is consistent with results from the present study in which some women wanted to do more housework for their cardiovascular health and found it difficult to comprehend that overdoing housework could be a health risk to their upper limb RSI condition.

In summary, although each woman attached different combinations of meanings to housework according to their life stages, consistent with a review by Klocokova (2004), the majority reported more positive than negative meanings. Speaking in the role of a homemaker, only Rosie mentioned housework as a burden, because she felt that she had no choice. Other women who expressed housework as a burden were usually referring to their childhood experiences. Even though some women also expressed there was no one else in their families who could do it for them (implying a lack of choice), they did not perceive housework as a burden. This could possibly be

because of a stronger perception of other coexisting positive meanings they attached to housework or particular housework tasks, which became part of their identity.

#### **4.10.2 Habits and routines.**

The present study indicated that women's housework habits resulted from an interaction of the various meanings they attached to housework, which then formed the basis of their overall attitudes towards housework or particular tasks. Positive meanings in housework generated positive attitudes towards it; negative meanings generated negative attitudes (Poortman & Van Der Lippe, 2009). As most meanings that women in the present study attached to housework were positive, there was a general positive attitude towards housework, or a particular housework task, among these women. As such, they also tended to be personally involved and to spend more time on it. In a study on gendered meanings in housework (Poortman & Van Der Lippe, 2009), the author's also found that when women had a favourable attitude towards certain housework tasks, such as cleaning, cooking and child care (that is, they felt responsible for these tasks, enjoyed them and perceived they had maintained higher standards than their partners), they also spent more time on these tasks.

As shown in the two case studies outlined earlier, the interaction among different housework meanings and the formation of attitudes towards housework involved a dynamic and complex process from childhood, leading to outcomes that varied between participants. This complexity was partly due to the multiple meanings that women attach to housework or particular housework tasks, and partly due to the mutual reinforcement of time spent in housework, and attitudes towards housework. Using Emily as an example, although she perceived cooking as a burden when she was young, she also felt it was important to perform this task to fulfil her family's needs. As a result, she perceived both positive and negative meanings in one task. In Emily's case,

her higher priority on fulfilling her family's needs resulted in her adopting an overall positive attitude towards cooking. When Emily adopted this attitude, she started to spend more time on it compared to her siblings, and developed better skills. When she became aware of her superior skills in cooking and felt pride, her attitude towards cooking became even more positive. Consequently, she spent even more time on it.

The women's housework routines were built on the housework methods and involvement level they chose, and were guided by the meanings they attached to housework. This then formed part of their identity. As described earlier, most housework meanings that women in the present study attached to housework were positive. They resulted in a general positive attitude towards housework at both a cognitive and emotional level: women thought it was important to do and they also felt good doing it. Thus, it would not be difficult to understand that the more positive a participant's attitude towards housework or a particular task, the bigger emotional turmoil they would feel if they were asked to change their habits following a diagnosis of upper limb RSI.

While housework meanings were deeply embedded in the women's habits and routines, the women's ability to conduct housework with these established and preferred routines became part of their identity. Magnus (2001) found in her qualitative study on ten women with a disability that the ability to perform housework was important to self-image as a housewife (referred to as homemaker in this study). According to the study, 'housewife' was one of three identities (mother, housewife and attractive woman) that these women perceived as important (Magnus, 2001). A study by Kerr and Fothergill-Bourbonnais (2002) on seven women with myocardial infarction also found that women equated the inability to perform housework with losing control of their home situation, and thus their value as a person, understood as a disruption to

their sense of identity. Women in that particular study expressed a sense of diminishment when they were unable to perform housework tasks (Kerr & Fothergill-Bourbonnais, 2002). Indeed, a study on 248 women with rheumatoid arthritis (RA) and chronic low back pain found that, despite their difficulties, the most characteristic phrase used by these women to describe life quality was 'to be able to do housework' (Nunez et al., 2006). A study that investigated physical activity behaviour in older women with RA also demonstrated the high priority they placed on housework (Semanik, Wilbur, Sinacore, & Chang, 2004). In the study, Semanik et al. (2004) found that out of 185 women (mean age 70 years and mean duration of disease 17.6 years), light housework tasks (91%), shopping (90%), food preparation (85%) and dishwashing (84%) were the top four tasks women participated in daily, among 15 other physical activities.

The important meanings that women attached to housework were not the only cause of emotional affect often experienced by women required to change their housework routines. Some women in the present study expressed how they valued their efficiency in housework. As such, a change in routine that resulted in less efficiency had additional emotional effect. A study by Hilbrecht, Shaw, Johnson, and Andrey (2008) on 18 mothers, who were happy to work as teleworkers to maximise their capacity to take care of their children and household chores, found that most women stressed the importance of following a routine. These women considered routine essential in efficiently managing their daily workload around the house, and they experienced frustrations if the routine was interrupted.

It was noted from the present study that housework habits and routines were difficult to change, not just because of the emotional effect this had on the women. One participant in the study described that habit as being like 'a circle in their brain': even if

cognitively they wanted to change, they could still forget to change. A meta-analysis of 64 studies found that when behaviours were performed regularly and frequently in a stable environment, intention became a less powerful predictor for future behaviour than past behaviours (Ouellette & Wood, 1998). In other words, as long as an action was repeated frequently and regularly enough, it would be difficult to change, even if the person made a cognitive decision to make a change.

#### **4.10.3 Identity in housework.**

According to previous research on identity development (Kroger & Green, 1996; Waterman, 1982), the development of the women's perception in meanings related to housework through childhood, adolescence and adulthood could be understood as the development of their role identities through these stages. These role identities were then organised into a system representing each woman's 'self' (Stryker, 1968; Stryker & Serpe, 1994).

As an adult and a homemaker within their own families, the women perceived meanings related to housework that reflected multiple significant role identities (woman, mother, wife) embedded within their role as a homemaker. This is in contrast to some research on women's role-related identities. In these, although the identity of mother, woman and homemaker was intertwined, they were often treated as separate identities (Graham, Sorell, & Montgomery, 2004; Kerr & Fothergill-Bourbonnais, 2002). The findings of the present study found that these embedded identities were demonstrated through the activities performed in the homemaker role, forming the women's daily housework habits and routines according to their different home situations. This concurs with the main belief in role identity theory that although two individuals might incorporate into 'self' the same meanings and expectations associated

with the same roles, they would also behave differently according to the context (Hogg, Terry, & White, 1995; Stets & Burke, 2000).

In summary, women in the present study considered their role as a homemaker as salient in representing the role of mother, wife and woman. As such, the housework habits and routines they developed over the years had become a behavioural representation of these identities. With these routines repeated year after year, they were not just a cognitive barrier to these women's ability to bring about change, but were also a major emotional barrier to their willingness to change.

#### **4.10.4 Interpretation of pain.**

It was difficult to change housework habits and routines because of the cognitive stronghold and emotional significance in its representation of these women's identity. Despite this, all the women in the present study reported some behaviour change in at least some housework tasks. When they experienced pain at the initial stage of their RSI condition, none made a connection that resulted in them reducing housework to manage their pain. One participant admitted she did not even feel pain in certain body parts. Most admitted they didn't think the pain was serious when they first experienced it; some just thought it was part of ageing. Consistent findings were found in a study with a group of Korean women with OA, who denied the pain when they first experienced it, thinking it was minor and not attending to it (Dickson & Kim, 2003). In this study, the authors found that when these women re-constructed the meanings of pain through the experience of OA, they resolved that the pain was a component of ageing rather than a symptom of disease. Another study with 31 healthy students found that when a very cold object was put against the women's necks, the women would experience increased pain if they perceived that the object was hot and would cause serious tissue damage (Arntz & Claassens, 2004). Thus, when the women in the present

study did not perceive pain as serious, their perception of pain intensity might also be lower. As a result, they might consider the condition not serious enough to need action.

The results of the present study indicated that when the women perceived their pain as normal, a change in housework would not happen. Indeed, a study with 45 women with arthritis and fibromyalgia found that the first stage of pain acceptance that led to life style changes was the realisation that the pain was not normal (Lachapelle, Lavoie, & Boudreau, 2008).

In the present study, as the researcher and an OT, I also observed this initial pain interpretation (that the pain was not serious, that it was normal as part of ageing and did not need to be attended to) could be a result of the women's desire to continue with housework to preserve their self-identity. I suggested that the women's perceived meanings of housework formed the basis of their positive attitude towards housework, which in turn became part of their identity and imposed a dominating influence on the interpretation of pain at this early stage. Thus, at a stage when they interpreted their pain experience without any advice from health professionals, most women tended to interpret it was unnecessary for them to make any changes to housework. A qualitative study with ten women with chronic pain found that the ability to do housework had a symbolic meaning of being capable and strong (Werner, Isaksen, & Malterud, 2004). Consistent results were found in another qualitative study, in which women perceived pain as a threat to their identities as capable women (Johansson, Hamberg, Westman, & Lindgren, 1999), if it resulted in them failing to do the 'womanly' duties of tasks around the house. A more recent study also found that women coped with pain by fighting to be 'normal' (Lachapelle et al., 2008), trying to carry out whatever tasks they had been doing in the pre-pain period.

When women perceived their pain as minimal or non-existent, they could also make less effort in its management. In a single case study of a married couple, in which the woman suffered from RSI, it was found that the interpretation of pain intensity was crucial in determining the efforts made to change her lifestyle, including housework (Dale et al., 2003). The extent of changes that the woman made in her housework was proportional to the level of pain she experienced. At a low level, she ignored the pain and continued with her usual activities; with moderate pain, she modified her routine to maintain her roles; at high level of pain, she changed the routines, but still maintained her own domestic roles (Dale et al., 2003). The interpretation of pain in terms of its seriousness and intensity could be understood as a dynamic process, one that is heavily influenced by the women's desire to maintain their role as homemakers, and hence their identity as women, mothers and wives.

#### **4.10.5 Interpretation of health professionals' advice.**

A change in the women's interpretation of pain began when they discussed their condition with health professionals. They determined if the changes advised by the therapists were necessary, by comparing the advice against their own pain experiences and their knowledge of other people's experiences with similar conditions. In the present study, the women would perceive the change as necessary only when they were aware of the pain, were convinced of its seriousness and experienced the pain relieving benefits of change. They could be strongly influenced by the experiences of other people who had similar pain conditions. When they knew of people who did not need to change and were able to recover from their conditions spontaneously, they would start to hope that they too could be cured and that a change might be unnecessary. In the study by Dubouloz, Vallerand, Laporte, Ashe, and Hall (2008) on women with RA, they found a challenge to personal change was the hope for improvement and cure, nurtured



by these women's experiences of pain relief during remission phases. When the women in the present study observed spontaneous recovery achieved by other people with similar conditions, they nurtured a hope to recover without a change, which became a barrier to making cognitive decisions to change. By doing this, they used optimism as a coping mechanism for an illness. A study by Fournier, de Ridder, and Bensing (1999), who explored the meaning of optimism, found optimism consisted of three dimensions. One of these is unrealistic thinking. In a study by Radcliffe and Klein (2002), which explored heart attack-related health knowledge, beliefs and behaviour of 146 middle aged adults, they found that unrealistic optimism could lead to defensiveness and higher risks.

Even when the women in the present study were convinced that change was necessary during the initial therapy sessions, they still had to contemplate the possibility of specific changes they had to make when they went home. This is consistent with the suggestions of temporal construal theory (Trope & Liberman, 2003). This theory suggests that a person's initial decisions on an action mainly focus on the abstract construal of options. Only when the time to carry out the action was closer would one focus on concrete details of the options (Trope & Liberman, 2003). While it was important to counsel the women on the necessity to make changes due to their conditions, it was also important for the therapist to understand the specific housework and home situations of the women to give practical and relevant advice, to convince them change was needed and possible.

Women in the present study focused on two main factors when they considered the concrete details of possible change: financial resources and family attitudes. Other studies on women with chronic pain or conditions agreed that the attitude of the women's families towards the uptake of housework responsibilities was an important

factor in their ability to make a change in their lifestyle and housework (Dubouloz et al., 2008; Werner, Steihaug, & Malterud, 2003). When women received advice from health professionals that did not consider these two important factors, they would possibly perceive the health professional as incompetent and uncaring. Participant Cindy used the word ‘commercialized’ to describe her impression of the encounter with an occupational therapist. In another study when women in chronic pain perceived the health professional as uncaring and incompetent, the encounter would be perceived as disempowering (Skuladottir & Halldorsdottir, 2008), resulting in the women being demoralised. To empower women with upper limb RSI to change their housework approach and manage their condition, health professionals have to carefully listen to, and communicate with, the women. They must consider these factors when conducting an education programme for these women.

#### **4.10.6 Decision making in housework—cognitive and emotional.**

Findings from the present study revealed that women’s emotional attachment to housework deeply influenced their decision to make changes related to housework after upper limb RSI. Indeed, emotion as a main component in various models of decision making was found in the literature (Lerner & Keltner, 2000; Markič\*, 2009; Naqvi, Shiv, & Bechara, 2006; Seymour & Dolan, 2008).

The present study described some important emotional conflicts experienced by women with upper limb RSI that came with their new role identity as a client in a hospital when they were told to make changes related to housework. The women found it especially difficult to decide about making a change to housework when it was perceived as disruptive to their role identity as a homemaker, resulting in a disruption to their family and personal harmony and leading to emotional turmoil. A study with 113 individuals with rheumatic disease, which was based on the framework of social

identity, showed findings consistent with the present study. In this study, they found that disruptions through illness to important identities were psychologically disturbing (Abraído-Lanza & Revenson, 2006).

The overall results in the present study revealed that although all women reported they had made some changes to their housework, none of them incorporated changes perceived as disruptive to their role identity as a homemaker, unless they experienced physical limitations. A study by Dubouloz et al. (2008) found that for women with RA, changes in behaviour happened when their meaning perspectives were transformed. In the present study, no participant demonstrated any major transformation of meaning perspectives related to housework. This difference between the present study and the study by Dubouloz et al. could be due to differences in the disease nature between upper limb RSI and RA. Most people with RA experienced major difficulties in housework due to physical limitations such as stiffness of joints and decreased strength; most women in the present study did not experience these limitations. As a result, they were more easily able to choose only those changes that did not result in a perceived diminished identity related to their role as a homemaker.

In the present study, Theresa, who adhered to the full range of housework advice given by the therapist, did not need to go through a major transformation of her meaning perspective in housework. Rather, her adherence to therapists' advice occurred with minimum cognitive and emotional conflict between her perceived housework meanings, housework routines and her personal interpretation of pain and health professionals' advice. An extract from the findings of a single case study by Dale et al. (2003, p. 250) could summarise how women in the present study made their decisions related to changes in housework:

Mary Ann selected adaptations that were least altering to her roles of mother and worker instead of selecting those adaptations that were effective in CTD symptom resolution.

In summary, the women in the present study made decisions related to housework changes based on factors with both emotional and cognitive dimensions. Advices on changes that significantly threatened women's expectations of their valued role identity as a homemaker and imposed a threat to their emotional wellbeing (personal harmony) could be easily rejected. Only specific changes that aligned with the women's expectations of their role identity as a homemaker were considered and translated into actions.

#### **4.11 Chapter Summary**

In this chapter, I have presented the findings of Study I, their discussion and a conceptual framework of women's decision making in housework following a diagnosis of upper limb RSI. Based on a client-centred approach in occupational therapy practice, the present study has taken systematic steps to 'listen and communicate' with women with upper limb RSI, regarding their perceptions of housework and making changes related to it. Although the findings of this study have made a significant step towards client-centred practice by formulating a conceptual framework based on the experiences of the women in this study, it has only painted a partial picture. In any intervention, two parties are involved: the clients and the therapists.

To construct a model of behaviour change in housework to be used in planning ergonomic education for women with upper limb RSI, we also need to understand the therapists' perceptions and clinical reasoning processes. Such a study would provide important concepts that could be integrated to complete model construction, which would guide practice. In the next chapter, I will present the findings and discussions of

Study II and a conceptual framework of therapists' perceptions of clients' stages of change when they conduct ergonomics education on housework for this client group.

## **Chapter 5: Study II: OT and Ergonomic Education on Housework**

### **5.1 Introduction**

The aim of this chapter is to analyse and discuss the experiences of OTs who conduct ergonomic education for women with upper limb RSI. The objective is to understand the personal and professional lenses used by OTs when they conduct ergonomic education programmes for women with upper limb RSI within their clinical setting. In the following sections, I will describe the characteristics of therapists and the focus of this study with the various themes and subthemes that emerged from the interview data. A conceptual framework of therapists' clinical reasoning in ergonomic education on housework constructed around these themes and subthemes will be described and the implications discussed.

### **5.2 Participants**

Fourteen OTs who provided ergonomic education for women with upper limb RSI, in the hand therapy outpatient clinic of a major Singapore acute hospital, participated in the study. The therapists were interviewed individually and in private; each interview lasted for approximately one hour. Four therapists who specialised in hand and upper limb rehabilitation and worked in the clinic on a permanent basis were interviewed twice for the professional insights that accompany intensive involvement in this clinical area. Ten therapists who had (at any point of time) worked in the unit on a rotational basis (each rotation ranged from 6 to 18 months) were interviewed once. The mean age of the therapists was 27.2 years (SD 3.6), with an age range of 23–36 years (see Table 5.1). Among the therapists interviewed, five had never employed a maid to assist with housework in the home. Throughout the interviews, the therapists who

participated in this study consistently referred to the women who received ergonomic education on housework as 'patients'. However, for the purposes of this thesis, the term 'client' will be used. This is consistent with the more client-centred approach emphasised as a central practice of occupational therapy. The term 'clients' will be used interchangeably with the term 'women with upper limb RSI' to refer to the same group of people.

Table 5.1

*Demographics of OT*

<b>Therapists</b>	<b>Age</b>	<b>Ethnicity</b>	<b>Country of origin</b>	<b>Marital status</b>	<b>Gender</b>	<b>Work experience as OTs</b>	<b>Experience of ergonomic education on housework</b>	<b>Living with parents</b>	<b>Ever had a maid at home</b>
1.Bob	25	Chinese	Singapore	S	M	11 months	2 months	Yes	No
2.Diana	26	Chinese	Taiwan	S	F	1 yr 5 months	1 yr 5 months	No	No
3.Grace	26	Chinese	Singapore	S	F	2 yr 7 months	1 yr	Yes	Yes
4.Heidi*	26	Chinese	Singapore	S	F	2 yr 7 months	2 yr 1 month	Yes	Yes
5.Jade*	36	Indian	Singapore	M	F	10 yr 6 months	5 yrs	No	Yes
6.June	28	Chinese	Indonesia	M	F	7 yrs	6 months	No	No
7.Martha	24	Chinese	Singapore	S	F	11 months	9 months	Yes	Yes
8.Sophie	26	Chinese	Singapore	S	F	2 yr 7 months	8 months	Yes	Yes
9.Yarra*	27	Chinese	Singapore	S	F	3 yr 7 months	10 months	Yes	No
10.Xena*	26	Chinese	Singapore	S	F	3 yr 7 months	3 yr 7 months	Yes	Yes
11.Anita	33	Chinese	Hong Kong	S	F	10 yrs 2 months	9 months	No	No
12.Frances	30	Chinese	Singapore	S	F	7 yrs 7 months	8 months	Yes	Yes
13.Yasmine	23	Chinese	Singapore	S	F	5 months	5 months	Yes	Yes
14.Heather	25	Malay	Singapore	S	F	2 yrs 6 months	8 months	Yes	Yes

\*interviewed twice



### 5.3 Focus of Study and Themes

Five main themes and two levels of subthemes emerged from the interview data. These themes reflect two main foci. The first three themes reflect the therapists' perceptions of their clients' stages of change and their professional roles in assessing and facilitating a client's *willingness and ability* to achieve change at each stage. The last two themes reflect the therapists' perception of two main challenges to their clinical reasoning process, which in turn impose a risk to fulfilling their professional roles. Table 5.2 shows the themes and subthemes of therapists' clinical reasoning in ergonomic education that revolve around their clients' stages of change and their ultimate therapy goal to facilitate clients moving towards a change in housework. Table 5.3 shows the themes and subthemes of the perceived challenges to OTs' clinical reasoning when they conduct ergonomic education and the potential risk to achieving the intended therapy goal.

Table 5.2

*OTs' Clinical Reasoning in Ergonomic Education on Housework*

<b>Main themes</b>	<b>First level subthemes</b>	<b>Second level subthemes</b>	<b>Ultimate goal</b>
1. Listening	Clients' willingness to listen	Determining the level of their willingness Setting the pace Inspiring trust	Change in housework
	Clients' ability to understand information		
2. Trying	Clients' willingness to try	Understanding the clients' perceptions Facilitating the clients' positive expectations of change	
	Clients' ability to recall information		
3. Persevering	Clients' willingness to incorporate changes into routine	Understanding the clients' experiences in making change Facilitating the clients' positive experiences in making change Reinforcing that change was necessary	
	Clients' ability to remember and problem solve		

Table 5.3

*Challenges to OTs' Clinical Reasoning in Ergonomic Education on Housework*

<b>Main themes</b>	<b>First level subthemes</b>	<b>Risk</b>
1. Challenge to therapists' credibility	Challenge to: Clients' willingness to listen and try	No change in housework
	Challenge to: Client's willingness to persevere	
	Strategy: Learning from the clients	
2. Clinical environment as a challenge	Challenge to: 'Listening and Communicating'	No change in housework
	Challenge to: Long term follow up	

## 5.4 Listening

The first stage of action identified from the therapists' perceptions of their professional role is 'Listening'. During this stage, the therapists' main aim was to facilitate clients' willingness to listen to information and their ability to understand it.

### 5.4.1 Clients' willingness to listen.

When therapists made initial contact with a client, all tried to form an impression of their client's level of willingness. According to the therapist's assessment of the client's willingness to listen, they set the pace for the education programme, and employed intervention strategies aiming to inspire trust.

#### 5.4.1.1 *Determining the level of their willingness.*

Therapists started the session by forming the first impressions of their clients' 'willingness to listen' according to their previous clinical experience with other clients. They categorised clients according to certain characteristics. Some therapists used age as an indicator. According to these therapists, those in older age groups were more receptive to the education given by therapists. Xena said, 'But I will say the general population is ranging between the middle age to the elderly, they are relatively more receptive'.

Others used educational level instead of age as indicators. Some therapists perceived that in general, clients who were more educated were also more willing to listen to the educational session. Anita said:

generally people with higher educational background are likely more receptive to different ways of doing things. People who are doing a lot of manual jobs or may be slightly lower educational background ... I find them ... quite hard to accept like there are different ways of doing things.

At this stage, therapists tended to form their initial impressions of clients by drawing on previous clinical experience with other clients, using certain demographic characteristics as indicators.

Once therapists started to interact with clients, they observed their clients' willingness through the questions they asked, and their responses to the information delivered. They tried to confirm their clients' level of willingness to listen by observing if their clients asked any questions. Anita said: 'It is the first interaction when you explain the pathology and precautions, whether they are listening or if they actually ask questions'. When the clients asked certain questions to find out more information about their conditions in relation to their own situations, therapists perceived these clients as more willing to listen. Martha said, 'there are some patients who are quite surprised and asked me where you get this from and things like that ... I feel that they are more accepting in a sense'. Yarra also said:

Some are quite receptive to advice, they will be quite happy to discuss and some questions to ask and to discuss about the various alternative methods that they can use and to find something that is relevant to them.

However, if a client asked questions about the therapist's own housework experience, the therapists perceived this a distrust, which could suggest a lower level of willingness to listen. Anita described how she perceived doubt from clients:

They asked you whether you have children, are you married, do you live by yourself or you live by your family, things like that ... They actually use the phrase 'do you know' or 'do you understand', such and such if they like yeah ... they are using it quite strong like 'do you, do you, do you' so I think that they might think that I don't understand.

Observing client's reactions during the education session was another way for therapists to assess their willingness to listen. Therapists perceived that clients were willing to listen to information in the first session if they showed interest in it during the session. Grace quoted one of her clients, "Oh, actually there is such a thing in the market, how come we don't know ...". Martha also said, 'I clarified and said it is from Daiso, then you know, "I really never see before". So they are actually quite surprised'.

On the other hand, a negative comment by a client was interpreted as indicating a lower level of willingness to listen. When Diana was asked what comments would lead her to believe a patient was unwilling to listen, she said:

usually the first and second time they come here they say 'no need to come for therapy la' ... and then 'no use any more' ... and then 'cannot be healed'.

#### ***5.4.1.2 Setting the pace.***

Once therapists had assessed a client's willingness to listen, they decided how much information and what information they should give. When therapists decided that clients were not interested in the information, some tended to give fewer details in the initial sessions. June said:

when you tell them [and] they said ‘no need, it is okay’. Then you can sense that they are not really interested. I will still tell them the basics but probably I would not go into as much details.

When the client was perceived as more willing to listen, therapists would be confident about delivering more information immediately. June said:

So they are a bit receptive, they themselves also want to know because they know it affects them and they know the importance of not making it worse ... So I will just go into telling them some of the important things they need to know on joint protection and how to modify activities.

Although strategies used by therapists varied, they perceived it was important to identify the client’s willingness to listen to adjust the ways they gave information from the very first session. Xena’s comments encapsulated this:

Because if the patient is extremely resistive, nothing you say during the joint protection part is going to be accepted so then usually what I do is I do another take ... I kick start the worry (get them to worry about their conditions). So that they will be more receptive, then the next session I will start the joint protection. So I find that a little bit more effective. So you know if people don’t want to listen, no matter how long you tell them, they are not going to take any home anyway.

#### ***5.4.1.3 Inspiring trust.***

Strategies to inspire trust were frequently used by a therapist from a session’s beginning. They perceived it was important to be recognised and trusted by clients in the education process. Providing answers to questions asked by clients was one way to demonstrate their role as experts in rehabilitation, and to inspire trust. Therapists perceived that most clients needed evidence regarding the effectiveness of the education

programme. Diana said, ‘some of my patients, they really asked me, “is there any research or do other patients get improvement after listening to your joint protection technique”’. Others needed to know more about their diagnosis, as Grace commented:

When I was in outpatient unit, patients will always come in and ask, ‘how come I have this problem? Is it because of my sleeping position, or because it is the work that I do?’.

Once the clients’ questions were answered satisfactorily, therapists perceived their willingness to listen would improve dramatically. Heidi noted the difference in the level of willingness between clients who were given an explanation about their hand conditions and those who were not. She said:

Usually they feel enlightened after they know what happened to their hands and I realize the difference between patients knowing what happened to their hands and patients who don’t know what happened to their hands.

When therapists answered a client’s questions to inspire trust, not many were confident enough to share their own experiences of housework for the same purpose. Xena, who was more experienced and confident in both ergonomic intervention in housework, and her own experience of housework, was one of the few therapists who shared her experience of housework. She believed that revealing her experience of housework could facilitate clients’ trust in her, ensuring receptivity to her educational session:

It depends on how convinced they are that I do housework, but I think most of the time some patients, after they realized that I do housework, they are a bit more willing to continue to listen to what I have to say.

However, most therapists were reluctant to share their experience of housework, as they were self-conscious about their relatively limited housework experience in

comparison to the clients. Anita commented, 'It worked for me, yeah but I think it is a bit of common sense for people who have done housework for a long time'. As such, sharing these experiences might even reveal their own inadequacy in housework, compromising their client's trust in them and their professional role. Some perceived their clients' distrust through a lack of interest in the education session. Yarra commented, 'I will feel that the patients feel that it is commonsensical, they will listen but sort of like they don't really ask a lot of questions'.

#### ***5.4.1.4 Clients' ability to understand information.***

All therapists perceived it was important to employ intervention strategies to facilitate their clients' understanding of the information at this stage. First they tried to assess their clients' ability to understand the information given by observing their reactions and the questions asked during the session. June said, 'I need to know whether the patient can understand what I am trying to say'.

When therapists determined a client had some difficulty in understanding certain information, they would use some form of visual aid (such as pictures of assistive devices) during the educational session. Martha said, 'they don't have, they can't see the visual, sometimes they cannot visualize the thing'. Most therapists found it difficult to explain to their clients clearly without the use of visual aids. Xena said:

We actually need a lot of photographs and products that we have seen in the market to show the patients that these are the things that exist in the market. Hmm ... sometimes I tried to describe ...but if they have not seen it, they will not know what I am talking about, but suddenly ... you know ... I don't have the picture of it. So I may have seen it somewhere some point of time when I am out but I didn't take a photo of it so I have a hard time explaining to them.



Yarra, Sophie and Martha also mentioned a number of visual aids they had used or would like to use to help clients' understanding: diagrams, brochures, leaflets and photographs. One therapist suggested using a case scenario to aid clients' understanding. Grace said:

If we can put it into like a case study where it will be easier for patients to understand ... Maybe we can say that Madame A has pain. May be similar to most of what our patients are experiencing and then just show them like how the so called ideal daily routine would be or should be like. Then they get a rough idea.

No matter what methods therapists used to help clients understand the information they delivered, all agreed they needed to understand the level of the clients' ability to process information to formulate effective and suitable intervention strategies. The therapists perceived that, while some clients were able to understand written information on brochures, others might need other visual aids for a better understanding.

## **5.5 Trying**

The second stage of action identified from therapists' perceptions of their professional role is 'Trying'. During this stage, the therapists' main aim was to facilitate clients' willingness to try the recommended changes at home, and the ability to remember how to carry them out.

### **5.5.1 Clients' willingness to try.**

Even though a client was willing to sit through the first session/s and listen to information, this did not necessarily lead to a willingness to try the therapist's advice in the home. At this stage, therapists perceived they needed to assess the client's

perceptions and to facilitate their clients' willingness to change by fostering positive expectations towards the change.

#### *5.5.1.1 Understanding the clients' perceptions.*

Therapists tried to understand their clients' three main perceptions: their conditions, the multiple information they received regarding their conditions and their habits. They perceived that understanding their clients' perceptions helped them to devise appropriate communication strategies to facilitate a willingness to try the recommended changes in their home.

Therapists considered that clients' perceptions of their conditions determined how willing they were to try the therapists' advice. Therapists perceived that clients who considered their condition as 'not that serious' and/or 'could be just ageing' were also less willing to try out the recommended advice. Sophie said:

If they see it as part of ageing, they will find that it is something that they just have to live with, 'I don't have to make myself be pain free. It is not a need you know, I am not sick'. Whereas someone who see that this is not right, this is not normal, this is an illness, they will be more motivated to change to get rid of the pain actually.

Therapists perceived the situation would only change when clients appreciated the seriousness of their condition, perceiving it was not 'normal'. Xena said:

Yeah so if they think it is very serious and in a lot of pain or they start to see deformities that they cannot correct then they will get worried. Then they will start to listen.

Xena used the phrase 'start to listen' as an expression to describe the willingness of the clients to try out the advice given.

Therapists perceived that the information clients heard from other people also influenced how willing they were to try recommended advice. Some of this information could come from doctors or from the clients' own friends or families. Heidi described how a doctor told her client that the main reason for attending occupational therapy was to receive laser therapy, rather than a full rehabilitation programme, which would include other physical modalities, exercises and education. Yasmine also talked about the barrier to change when clients received information from peer groups that conflicted with what she advised:

Someone telling me that they have other source of information ... But it could be just from their fellow friends from the market who do not know what is best for them, so they will just share around the information and then they will ingrain in them. So it is very difficult to stop doing what they have been told to do by their friends.

Although therapists perceived that certain information their clients obtained from family and friends might be inappropriate, they recognised the power of influence this kind of information had on their clients. When therapists tried to persuade their clients to follow advice that was different from that given by friends, the therapists experienced resistance. Some therapists admitted feeling frustrated when they faced this resistance, reflecting a sense of helplessness regarding their ability to convince clients to change. Yasmine continued:

They have external input, like from friends and community programs, I feel very frustrated to talk to this group of patients because they say they cannot change.

Therapists identified with the difficulties their clients perceived when they tried certain changes at home. All agreed that habits and routines were hard to change and it took a lot of effort. Heidi said:

even if he/she is convinced, it also requires a lot of effort and it costs a lot of efforts and you need to be very conscious about it if you need to change it.

Because it is already a habit, it is very difficult to change a habit.

Some therapists perceived two main reasons for their clients' resistance to change. First, clients felt it was their responsibility to do all the housework and it had become part of their daily routine. As a result, clients would find it difficult to accept therapists' advice to reduce their housework. Anita said:

I find ... hmm I think the older generation ... they think it is impossible to cut down ... maybe people at their 60s plus 1a, I think it is like they just cannot cut down their housework, that is their responsibility and they cannot not do it, cannot just get help, you have to do it forever.

Second, therapists perceived that clients viewed their own housework methods as superior to advice given by therapists. As a result, they found it hard to adopt any new methods suggested by the therapists. Xena said:

She thinks that her grandmother and her ancestors have always been cooking vegetables this way and this is the best because this makes the vegetable taste better.

Diana also said, 'Or they say that if change the other ways to do the housework, not very convenient and not get used to it'.

Therapists perceived that when clients found it difficult to change their established housework habits and routines, and simultaneously considered the therapists' solutions as inferior, they would resort to just accepting their condition. They would express their unwillingness to change using words such as 'not possible' or 'no choice'. June said:

they will say things like, ‘but it is not possible, how to do this, how to not do housework, how to rest’ and there is this perception that it is easier for us to tell them. But when they actually do it, it is easier said than done. So because of that, already with, I feel like sometimes when they come in, in their minds, they already have half accepted it that it is something that they have to live with.

#### ***5.5.1.2 Facilitating the clients’ positive expectations of change.***

Therapists tried to facilitate clients’ positive expectations towards a change in housework by convincing them that the change was necessary, possible and acceptable.

##### *5.5.1.2.1 Change is necessary.*

Recognising that some clients might not take their condition seriously, and not be convinced it was necessary to make changes to their housework, some therapists responded by explaining the conditions to them clearly with elaboration on the possible consequences. Jade said, ‘tell them about the damage, how it will worsen their condition if they continue to do this’. Other therapists would reinforce the condition’s consequences when the clients came back in subsequent sessions with persistent pain and confessed they had not tried the specific recommended changes after the first session. June said:

First I will ask them where is the pain and then how much, is it worse than the week before they came to see me. Then I will ask them whether they do anything different, or do they continue to do the same thing but at a higher intensity level. Because some may be doing some spring cleaning and whatever, then I will see from there. Then if they say everything is the same, then I will go back to ... again to what I told them. That is why I tell you, you have to do certain things this way. If you don’t do this, 10 years later when you see me, you will still be with the same thing, you will still be painful again so I will try and

get them to understand that that is the reason that I tell them to do certain things in a different manner.

Some therapists reported using visual aids (such as pictures of deformed hands) to reinforce possible consequences to those clients who were perceived as extremely resistant to change. Xena described, 'I find the most deformed hands and show them and tell them this is a potential problem. This is potentially what can happen if you don't take precautions now'.

Some therapists also tried to reinforce with clients the benefits of a change in housework to manage their condition. Some would use previous clients' successful experiences in pain reduction, tapping into the influential power of peer experience.

Grace said:

other people who are also having the pain and this person has gone through this before and now telling me this piece of advice, it seems that the patient will be more willing to accept.

Others would encourage the clients to try certain new household assistance devices during therapy. It was a common perception among therapists that once the clients had a chance to try a new housework method with positive experiences during therapy sessions, they would appreciate the usefulness of the changes and become more willing to try them at home. Xena described how trying out devices could help her clients to appreciate that the change was necessary and beneficial:

When they try, they really noticed the difference in terms of use of strength and the ease of using the products and of course once you find it is good, it is easier for you to appreciate and to react and be more receptive to whatever people have to tell you.

*5.5.1.2.2 Change is possible.*

Therapists perceived that the more steps a client was required to go through, the more difficult it would be for her to change, especially early in the sessions. As such, they provided recommendations instead of forming a partnership with clients to come up with changes in housework. Heidi said, 'If you provide them with a solution already then it is more possible'. They also recommended changes that did not involve purchasing a particular device. Heidi continued:

A solution that involved no device would be easier than one that required a device ... we can actually through conversation with them provide solution that they actually have already at home to make a difference.

Most changes recommended by therapists involved the use of labour saving household devices. They observed that clients would be open to trying the device if they considered three factors while recommending it. First, it could be purchased in a general rather than a specialised store. Therapists commented that clients were resistant because of the stigma attached to using something from a specialised rehabilitation store. Martha said, 'think they are more accepting to this kind of, this kind of tools or objects'. Second, it could be purchased in a neighbourhood store rather than from a store in another district. Xena said, 'so they will be like, "oh it is too far. I don't really want to go all the way there"'. Anita also said, 'They don't know where it is. And they don't go out very often'. Most experienced success with their clients when they recommended a device that was easily available in a neighbourhood store. Anita continued:

I think most successful is non-slip mat because it is very easy to buy and when they see the mat, they said 'oh yeah, we know where to find it'. And then they

will come back and say it is quite useful. Third, it should not be expensive. Jade said, 'if it is not expensive then they are quite keen to get it'.

Therapists perceived the success of their recommendation was dependent on clients' financial and social resources. That is, clients with better financial resources and social support from the family were usually more willing to try and make appropriate changes, compared to those with fewer resources. June said:

those who really can try things are those who can afford also. I find...those who have maids, those who have people helping them, those who have children staying with them who are very supportive and tell them 'you don't do anything' ... so the family member helped with everything.

#### *5.5.1.2.3 Change is acceptable.*

Therapists perceived that clients were also less inclined to accept changes that were drastically different from their housework habits and routines. Xena described guiding clients through gradual changes by starting with a few simple and carefully selected tasks to make these changes more acceptable to the clients. She said:

Yes, I think it should start with the small things and if they find it is useful then next time when they see you again, they will be more, more willing, more accepting newer ideas or things that need more drastic changes for example.

The following is a detailed description of Xena's perspectives and experiences with one of her clients who used chopsticks to stir fry vegetables instead of using a ladle. The client was reluctant to change because she felt it was a better method that had been passed down through generations:

everybody's way of doing housework is different. So sometimes some patients tell you very different things that you have not heard of. Like ... I have a patient who fries vegetables using chopsticks. So when I heard that I am like ...



what??? Because I have not heard anybody frying vegetables using chopsticks ... So it is something that she thinks it is better, she thinks it is good. I have a hard time convincing her otherwise ... And imagine you are using chopsticks to fry a whole wokful of vegetables; it is going to be very repetitive and forceful actually. So she was not very receptive using ... the ladle.

Xena then went on to describe how she tried to show respect for the client's values by providing a solution that was acceptable for her and at the same time imposed less biomechanical strain:

so then the only option we provide is to use very thick kinds of chopsticks, because other than that she will not accept anything else. They have such rooted values that it is a bit difficult to change and I think we also should respect patients' wants when we come to such things.

Although not all therapists could articulate how they had helped to make changes more acceptable to their clients, most demonstrated awareness of clients' tendencies to preserve habits and routines as much as possible. Grace's comments encapsulated this perception, 'and I think the patients they voice out like they want to come here for therapy to improve and to be able to resume their daily routines'. Despite this awareness, most therapists did not demonstrate a deeper understanding of why the clients resisted making changes related to housework routines, according to their recommendation. Findings related to this aspect will be presented in later sections under the theme of challenges to therapists' professional roles.

#### **5.5.2 Clients' ability to recall information.**

Most therapists were concerned about whether clients were able to remember information correctly after the therapy session. Most therapists perceived it was not uncommon for their clients to forget information given in the education sessions. Anita

said, 'Because when you tell them, they may forget when they walk out of the hospital'. Yarra also agreed, 'they forget precautions they are supposed to observe and things like that'.

Therapists understood how difficult it was for clients to remember all the information provided, and they were concerned that clients would not be able to make changes at home as a result of this. June said:

So they will listen and they say they will try but along the way because they easily forget so that end up not complying what they originally they wanted to do and to change in the first place. Because it is very hard to remember everything.

To facilitate clients' recall of information, therapists perceived that giving information for the clients to take home helped. Yarra said:

I guess different units we have brochures or leaflets that is helpful when we explain things to patients and stuff like that, so I think these medium are quite helpful. And then you know it gives something for patients to take away as well.' Anita also said, 'maybe we can provide them the ...hmm may be some pictures or a little booklet which they can go back home and read and may be with some address, the names of the shops that they know where it is.

Therapists were also aware that delivering generic information during housework education could sometimes confuse clients and make it even more difficult for them to remember the relevant information. June said, 'the pictures are also quite generic and some of them don't really apply to them, may be only 60% of what we say, apply to them'. Thus, most therapists suggested identifying and delivering information relevant for each client, so they would remember the information clearly. Some

suggested that focusing on a few goals could be one way to achieve this. Heather suggested:

I think one way we can try out is to get the patients to list ... may be the top three housework that they do and from there we just follow up with them on three household chores that they do to just focus on the joint protection techniques on things that they do, then at least the education will be more concentrated and focused.

Others tried to test if clients remembered the information given within the same therapy session or in the subsequent sessions. June said:

Provided they can really re-explain everything to me again what I told them earlier on, what are some of the principles of joint protection.

## **5.6 Persevering**

The third stage of action identified from therapists' perceptions of their professional role is 'Persevering'. During this stage, the therapists' main aim was to facilitate clients' willingness to incorporate changes at home. This stage also included facilitating clients' ability to remember carrying out changes habitually, and solve problems when faced with a new situation.

### **5.6.1 Clients' willingness to incorporate change into routines.**

Therapists recognised that to provide further advice, they had to understand clients' experiences as they started implementing these changes at home. At this stage, they perceived it was important to reinforce the necessity of changes again by emphasising both the positive benefits and the negative consequences of not making any changes.

### *5.6.1.1 Understanding clients' experiences in making changes.*

Therapists perceived it was important to understand clients' experiences (when they implemented changes to housework) to facilitate their willingness to incorporate these changes into their daily routines. Most therapists suggested recording clients' experiences in housework through a form of self-assessment checklist. Anita said:

I think may be a little checklist at the back of the booklet which they can tick, or just a little reminder, the pain level, what things they have done. Daily follow up, using a particular kind of doing it, a booklet they find useful they can actually recall. May be they can bring it back like a record chart.

Regardless of the methods used to understand their clients' experiences, therapists perceived their main focus at this stage was to understand the difficulties that clients faced, and the barriers to their willingness to incorporate recommended changes into their housework routines. Therapists identified two main barriers to change for their clients.

The first barrier was experiencing inconvenience when they tried changes at home. Therapists considered it difficult for clients to change their habits if they tried to, but then found the new housework methods less convenient than their routine ones. Diana said, 'they say that change the other ways to do the housework, not very convenient and not get used to it'.

The second barrier was 'a reduction or lack of pain'. Therapists perceived that clients' pain levels also greatly influenced their willingness to continue with changes at this stage. When clients' conditions improved, a lack or reduction of pain could indicate they had recovered, making them less willing to incorporate the changes into their routines. Jade discussed that when there was no pain, the clients' willingness to make

changes to their routines also vanished, ‘especially they find that the minute the pain reduces, they go back to the task, the wringing of the cloth’.

#### *5.6.1.2 Facilitating the clients’ positive experiences in making changes.*

With an understanding of their clients’ experiences and difficulties when they tried changes at home, therapists noted they could then adjust their advice to ensure that clients had positive experiences in their next attempt. June said:

the next session that they come in we can actually follow up with them, whether or not, is there any problem they face or they want to, they want us to explain one particular area in detail, when because at home they have tried and it is not working.

Therapists agreed that clients needed positive experiences when they tried the recommended changes for them to develop positive expectations towards incorporating these changes into their routines. They perceived two types of positive experiences important to their clients’ willingness at this stage. The first was when clients experienced improvement. Sophie said, ‘So when they try, they actually see some improvement, they are actually quite open to the change after that’. When this happened, therapists perceived that clients would be more willing to make long term changes. The second was when clients found the suggested methods suggested were easy to follow, practical and convenient. Some therapists considered prioritising and focusing on just a few housework tasks to make it easier for clients to incorporate them into their routines. June said, ‘Probably it is just downsizing and prioritizing what activities they need to do most of the time’.

However, most therapists found it difficult to come up with further solutions when clients returned to them and advised their recommendations were impractical and

inconvenient. This aspect will be analysed later in this chapter, as part of the challenges to therapists' credibility.

### ***5.6.1.3 Reinforcing that change is necessary.***

At this stage, most therapists perceived they had to reinforce that change was necessary, despite its inconvenience and seeming ineffectiveness in providing immediate pain relief. Most therapists stated they needed evidence to show clients that the change was indeed beneficial. Jade said:

Also we may need to have some data how the education has helped patients, may be mainly subjective information from the patients' point of view ... how they find that by changing the ways they do things they are able to work better, they can do more things although they have to change the ways they do it.

Based on their clinical experience, therapists knew that the clients who were willing to make a change in their housework routine would actually improve faster and could be discharged earlier. They would then share those observations with their patients, hoping to convince them of the benefits enjoyed by making such changes.

Frances said:

So I tell them that if they really adhere to the advice like joint protections that I teach and also the way you do certain things and monitor the pain level as you do certain activities at home, you don't have to stay too long for therapy and you can adopt and maintain the conditions and even improve the conditions for a life time ... because you don't really need to come here and depend on the therapists for the treatment.

### **5.6.2 Clients' ability to remember and problem solve.**

Therapists appreciated that for their clients, 'habits [were] hard to change', change did not occur automatically, and could be easily forgotten. When clients kept

forgetting changes when they were just trying them out, therapists thought they might find even more difficulty in making these changes routine. As a result, clients could become less willing to change, June said:

It is not that they don't want to, they want to change but they find it is very difficult for them and they forget most of the time. yeah not so much as they forget what they are supposed to do but when they are doing this and forget that they are supposed to do things like that. Only after it has passed, they said never mind, I will start tomorrow, then tomorrow the same thing happen, then I will start tomorrow again, so end up never getting started, you know.

Among all the therapists, only one expressed concerns about the limited support available to their clients at this particular stage of change. Xena was concerned that at this stage, it would be difficult for her clients to maintain changes if no one was available to remind them. Xena said:

If they come and see me on a regular basis, there is constant input and reminder. May be every week or every fortnight, they may forget after a while but because they have appointment with me, they can be reminded again, then they will follow up with the good behaviour. But once there is no reminder or trigger, then it is also easy to fall out of habit, so how long the good behaviour will result in habit is difficult to say.

Therapists also perceived that clients' abilities to generalise information given during the education sessions would help their problem solving abilities in their daily housework situations, even after they were discharged. Heidi said:

They need to know what happened to their hands and what are the actions and things that they are doing that give rise to their current conditions and how they

can generalize the precautions we give them into whatever things they have been doing. These will serve them in the long run.

Some suggested that a simple test of clients' problem solving abilities should be conducted before they were discharged from therapy. Bob suggested:

maybe before they are given open dates, maybe we will just check with them, how is it again ... we could perhaps place a new item there and just test if they are okay. Ah is this good for joint protection, to see if they have learnt this principle can be applied.

However, these strategies, were not carried out consistently by all therapists before their clients were discharged.

## **5.7 Challenge to Therapists' Credibility**

Therapists felt that the clients' doubts about their credibility when providing advice on housework directly affected their willingness to carry out required actions at each stage of the education process. The therapists in this study perceived distrust from their clients in the form of doubts about their ability to understand their role and situations, and directly challenged their therapist's role. The dilemma over therapists' credibility was experienced when they felt their expert status was challenged. This could be experienced on two levels.

### **5.7.1 Challenge to clients' willingness to listen and try.**

The dilemma over therapists' credibility was first experienced when therapists perceived that clients were unwilling to listen and/or unwilling to try the recommended changes. The therapists in this study identified two main factors in explaining this dilemma. The first factor was their own limited housework experience, due to differences in lifestyle and social roles between them and their clients. The second



factor was their much younger age. In this situation, therapists started to doubt their own abilities to be expert in the education process.

There was indeed a gap in housework experience between clients and therapists. Among the 14 therapists interviewed, 12 were not married and were living with parents. All were considerably younger than the clients they educated on a day-to-day basis. Among the therapists who were still single, most had grown up with maids or their mothers doing the housework. Ten admitted minimal involvement in housework at home, and only three were involved in regular housework. Even for the two therapists who were married, and regularly participated in housework, they perceived their years of experience in housework were still significantly less than those of any clients they educated on a daily basis.

Most therapists were self-conscious of their relatively limited housework experience compared to the clients they educated. This was most often cited by therapists as one reason for clients' tendency to distrust them. Anita commented that the difference between her life roles and those of her clients was one reason they doubted her:

When they talk about family, family needs, this and that ... and I don't have children myself so I probably cannot like ... I can only like ... listen and respond to a certain extent. And I don't have that experience of like ... yes you have to cook for how many people, yes you have to like clean and hang up clothes for that many people in the house and their lives ... their routines are so busy yeah. So that part they would have some queries about my own experience.

Heidi also felt strongly about the difference between her housework experience and that of her clients:

I can't even convince myself about household, household task solutions in a way. I guess I myself don't even try out a lot and yeah ... I mean I cannot also say that 'I do a lot of housework, please believe me'.

Therapists also felt that differences in age between them and their clients gave them less credibility as experts to give advice on housework. Some therapists perceived this factor as an issue because of self-consciousness regarding their much younger age. Heidi said, 'Yeah. And in terms of age, they probably will think that I am less experienced than them in doing household chores. Yeah'. Some also received comments from clients that reinforced these doubts. Heather reported the comments she received from her clients:

subjectively from their facial expressions and sometimes they were like ... make comments like, 'aye you are such a young girl, you know for patients there are a lot of things to do, you people don't know la, you people are quite young, got a job. While for us patients there are still a lot of things to do, kids to take care, grandparents to take care, father and mother and all that'. So for these kinds of comments they will say that 'maybe you might not be in a position to really understand what are the tasks or my job roles'.

Even those therapists who considered they had considerable housework experience also faced this challenge. Xena, who participated in housework regularly, and had a certain level of confidence in her own housework experience said:

they will look at you and they wonder if you do housework at home. So they will take it with a pinch of salt, you know. 'You don't know ... you don't even do housework, how are you going to tell me how to do housework while I am a full time housewife forever'.

When therapists were asked about their personal meanings attached to housework, most responded they perceived housework as only a task to be completed and declared that housework did not mean much to them personally. Heather said, 'Just a task for me ... if I can avoid it, I will avoid it'. When the therapists were asked about their perceptions of their clients' personal meanings of housework, all perceived it was seen by the women as their responsibility. Frances said:

I think it is more their roles and duties. They need to cook for their husbands and children and some of them they told me that even though their children are in their twenties, they still cook for them and do the laundry and the housework for them.

The therapists acknowledged their view of housework could differ from their clients', in that they did not share the same sense of obligation and pride in housework. During interviews, each therapist was given a briefing on the meanings of housework perceived by women with upper limb RSI (see Chapter 4, Figure 4.1); most therapists responded with surprise. On housework being a pleasure and pride, June said 'Oh? Okay. Cool. I wish there are more people like that'. Others acknowledged that awareness of the effect of meanings a person attached to housework could affect the way the communicated with clients. Anita said:

now I am starting to think about when I am talking to people about joint protection like changing the ways to do things. I will actually consider a lot more on their experiences now and how things come out of my mouth will sound to them.

Diana also reflected on how she had never thought about what housework might mean to her clients when she provided education to them, 'Okay I think that I didn't really think about the meanings of housework and I also didn't really ask the patients'.

When this was the case, therapists could easily give advice without considering other housework meanings that were important to their clients. Therapist Frances talked about the kind of advice she gave to her clients when she assumed that housework was just a burden to them, 'I did advise that "you have to tell your children they are old enough, they have to help you ... So relieve you of some burden"'.

The dilemma over their credibility was a continuous struggle for the therapists. The main issue was generational, which compromised the therapists' ability to empathise with their clients. As Anita said, 'we never do housework, we don't understand or we don't empathise as much'.

### **5.7.2 Challenge to clients' willingness to persevere.**

Once clients had tried the advice and found they did not like the solutions or perceive them as useful, therapists perceived that clients would confirm doubts about their professional ability. As such, clients would be unwilling to persevere with the recommendations.

Although therapists in this study acknowledged it was better to engage clients as partners to create changes related to housework, they also agreed that most clients expected recommendations from therapists, especially in the earlier stages of education. Grace noted one client's comment as, 'if you can provide me a solution or to let me know where I can get them to solve my problems'. Despite the obligation to provide satisfactory recommendations to their clients, most therapists felt inadequate in doing so. Heidi said:

Yeah I cannot provide them with many clues and avenues ... like I don't know what to do also ... If you tell me that the cloth is very wet and you really need to dry it. I will say very straightforward thing which I don't know whether they will buy it la like put in a dryer or just be more patient, you know wait for the

sun to dry for you. Or use a tissue instead of using a cloth. Yeah it is costly but it will benefit your hands in the long run. Yeah those are the usual things I tell my patients but I don't know how well they will want to receive the message la. Yeah.

While therapists tried to provide recommendations to the best of their professional ability, they found that some clients still did not consider their recommendations good enough. Inconvenience was explicitly mentioned by Xena, Anita, Martha, Diana, Grace, June and Yarra as one main reason for clients not making recommended changes. When therapists provided solutions to the clients who did not work, or were considered impractical and useless, therapists reported that clients would directly express their doubts. They challenged the therapists' abilities to understand the difficulties in making changes. June said, 'because I actually have one or two telling me that "You say it so easily, it is not you"'. When this happened, trust was perceived as lost. June continued, 'and it doesn't work, then after a while it just dies off because they don't trust us any more'.

While therapists had perceived the dilemma over credibility as a form of speculation in the earlier stage of willingness to change, they now perceived this speculation as a reality when clients thought their advice was impractical and unacceptable after they had tried making changes.

### **5.7.3 Strategy: learning from the clients.**

Therapists who recognised this difference between themselves and their clients took advantage of the situation to learn from their clients, gaining future credibility. Anita was one of the few therapists who recognised the value of partnership in a client-therapist relationship. She said:

But we actually interact ... so I think education is not just one way education, at the same time, people are different, they are actually educating therapists ourselves, like how we feel about different cases, process of problem solving, I think it is sometimes the family or the client comes up with pretty good ideas as well.

Most therapists recognised the value of tapping into the experience of other clients who managed to make successful changes, with subsequent improvement in their condition. Sophie said, ‘Yeah and that is when it is quite hard, so for us therapists ... it is really trying to find more examples especially from patients who have applied and tested and say yeah this works’. Anita also said:

for example, this patient teaching me how to open jars that has never been opened before, because yes we use the non-slip mat and all that, but it is only applicable for jars that have already been opened once, yeah, but for those never opened before, it is still using a lot of effort to open and they taught me how to actually bang the lid of the bottle to the table top lightly and then different styles, sometimes use heat and then to open for the first time. So those are the things that I have not tried before, and then I learnt something out of it.

Once therapists learnt new ideas from their clients, most perceived they could use them to teach and inspire trust in other clients in the future. Xena said, ‘Sometimes they teach you new things, then we discuss, we realized that ... you know ... this is also quite possible to teach to other patients’. However, none made a conscious effort to transform their relationship with these clients into a partnership.

## **5.8 Clinical Environment as a Challenge**

Therapists perceived that the current clinical environment, in terms of time and space, presented some important challenges to the facilitation of their clients’

progression in their willingness and ability to change. They felt sufficient time and a conducive environment were crucial for listening and communicating with their clients so they would follow the therapists' advice. They also believed these conditions were essential for consistent and longer term follow up.

### **5.8.1 Challenge to 'listening and communicating'.**

Although housework education was conducted on a one-to-one basis, therapists reported they provided education to clients who were merely sitting next to other clients in an open outpatient clinical area. It had been a clinical routine for one therapist to attend to a few clients simultaneously. Having an environment that was conducive to, and gave sufficient time for, 'one therapist to one patient' contact was explicitly mentioned as important for thorough assessment and intervention by three therapists with the longest years of experience in the outpatient clinical area. Jade talked about how having a environment conducive to, and allowing sufficient time, would give clients the chance to ask questions:

getting the patient one-to-one which we don't really do very much, because we see quite a number of patients at the same time, so it might have more impact if patients have better ... may be able to ask more questions if they have one-to-one sessions instead of in a group. I mean they are not having a group session, but if there are people around, they may not be asking questions.

Sophie talked about the distractions she faced when she tried to attend to her clients:

You talk to them half way. Then you have to stop to attend to other patients then go back to them. And sometimes they lose their focus already, then they are not very interested especially the more you go on. So I don't know if there could be a designated time for these patients to just listen.

All therapists agreed that having enough time with their clients was important to uncover sufficient information to deliver relevant ergonomic education on housework. At times, more than one interview session was required. June considered it important to find out the clients' daily routines, medication and other medical history to provide relevant education. However in the current outpatient clinical environment, she found it a challenge to achieve this with the caseloads she had to handle.

Martha also described how it took several sessions to build rapport with her clients so they would disclose more details of their housework situations for her to provide relevant education. She said, 'subsequent sessions after they come back a few times, then the rapport better, then they started to disclose more things'.

When therapists did not have sufficient time to listen to and communicate with clients, they worried this would lead to unclear, irrelevant and impractical advice being given. Heidi described the advice as 'hard and fast'; recommendations that were not specific to clients' situations and at times were impractical. She also talked about how her clients would be unwilling to follow her advice when they did not get a clear explanation of what happened to them in the first session due to time limitations, 'then they will be confused, they may not comply to what we have told them during the very first initial visit'.

### **5.8.2 Challenge to long term follow up.**

Although therapists wanted to know whether clients persevered with the changes in their housework after their last therapy session, all agreed they did not know what happened to clients after they were discharged. Therapists tended to work within the limitations. Xena said:

the current situation is we taught them, they go back and try and they come back to tell us that they can follow and we discharge them. A few years later down



the road, they may or may not be able to follow up, you never know, so that is no self-check mechanism for this kind of service.

Among all therapists interviewed, only two expressed their concerns over lack of support for their clients in the later stages of change, when the clients were discharged from therapy. Although they were concerned, these two therapists did not feel this was an issue they were able to resolve, given the current clinical environment. As such, they also did not focus on what they could do to improve the situation. Bob said: 'I cannot figure out how to do this in a different way, what can I do? And there is no one to guide them'. Only with further prompting did Bob finally make a suggestion:

If time and resources permit, have regular joint protection education workshop, if you put it that way, may be every nine months or one year like that, so that we can just talk to them, so they can share their experiences because in a group they may have better ideas and they might understand better rather than therapists find out for them.

While most therapists tried to make the best of their current clinical environment, and some expressed their wishes for better conditions and support, all worked within the limitations rather than devising strategies to make changes.

## **5.9 A Conceptual Framework on Therapists' Clinical Reasoning**

A conceptual framework of the therapists' clinical reasoning process was constructed, based on the themes and subthemes described above (see Figure 5.1). The therapists in this study designed their assessment and intervention strategies around the 'willingness' and 'ability' of their clients to make changes to housework in stages. The therapists perceived their goal was to facilitate clients in achieving the appropriate actions for change at each stage. These action stages were: 'listen', 'try' and

'persevere'. Successful completion of an action at one stage moved clients to the next stage of change.

When therapists tried to facilitate the clients' transition through these stages of change, they demonstrated confidence and resourcefulness, reporting various strategies they used to facilitate and observe their clients' ability to change at each stage. The major challenges therapists perceived and considered during their clinical reasoning mainly related to their clients' willingness to change. Most therapists felt their own limited experience in housework was the main cause of their clients' doubts towards them as a therapist providing advice on housework. Only a few had ever considered that their understanding of their clients' personal meanings of housework was inadequate. As such, they also did not manage to explore these meanings when they conducted the ergonomic education programme. At the same time, they felt inadequate to devise strategies to facilitate their clients' willingness to change. Another challenge that therapists experienced in the clinical reasoning process was the limitations imposed by the clinical environment in terms of space and time. Therapists adjusted their plan of an education session within these limitations.

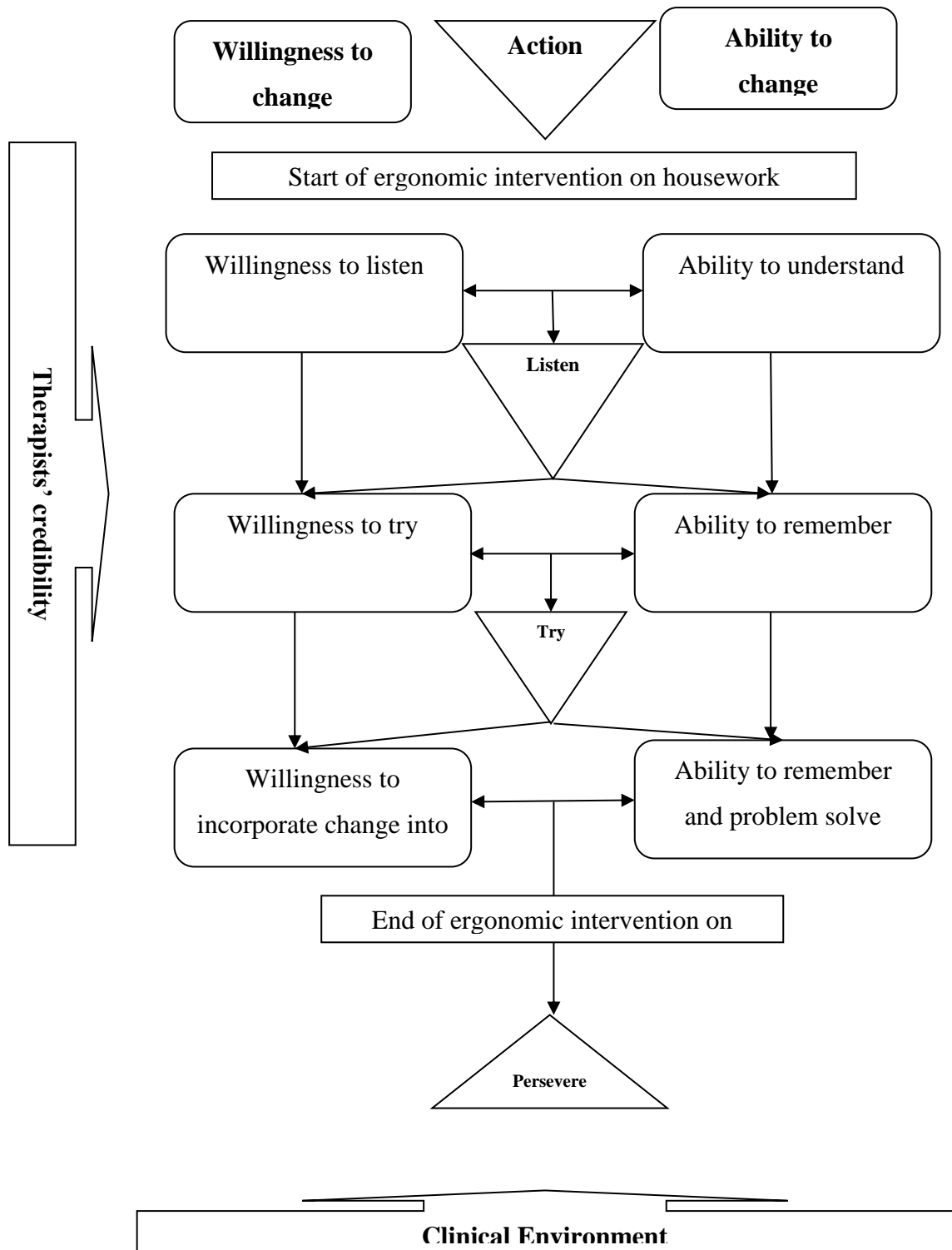


Figure 5.1. A conceptual framework of occupational therapists' clinical reasoning in ergonomic education on housework.

## **5.10 Discussion**

This study has brought OTs' tacit knowledge, as used in their clinical reasoning, within an explicit framework. Although no therapist in this study articulated their clinical reasoning process as being based on a particular theory, the framework clearly reflects the therapists' use of a 'stages of change' model. The framework also reveals two challenges to the clinical reasoning process that need to be addressed when planning an ergonomic education on housework for women with upper limb RSI in Singapore.

### **5.10.1 Stages of change.**

The present framework of therapists' clinical reasoning process clearly reflects the use of a stage change model. Stage change models that are particularly relevant to, and have been applied in, health behaviours include: health action process approach (Barg et al., 2011; Scholz, Keller, & Perren, 2009; Schüz, Sniehotta, Mallach, Wiedemann, & Schwarzer, 2009), goal achievement theory (Bagozzi, 1992; Nadkarni, Kucukarslan, Bagozzi, Yates, & Erickson, 2011), model of action phases (Brandstätter, Heimbeck, Malzacher, & Frese, 2003), PAPM (Mauck et al., 2002; Weinstein, Lyon, Sandman, & Cuite, 1998; Weinstein, Sandman, & Blalock, 2008) and transtheoretical model (TTM) (Di Noia & Prochaska, 2010; DiClemente & Prochaska, 1982; K. L. Hall & Rossi, 2008; Prochaska & Velicer, 1997).

When the present framework was compared with the various stage change theories as mentioned above, it was found that the stages of change identified in the present framework share major similarities with certain important constructs in the widely researched TTM (K. L. Hall & Rossi, 2008; Heather, Honekopp, Smailes, & Team, 2009). It showed that although therapists did not manage to verbalize the use of a theory when they conduct the education, their clinical reasoning process reflects

therapists' implicit adaptation of TTM for use in the education process. As such, in this section, I will focus on comparing the present framework with TTM only.

The TTM was developed by Prochaska and Di Clemente (1982) from a comparative analysis of 18 leading therapeutic systems in psychotherapy. It was initially tested on a population of 827 people who went through the process of changing their smoking habits on their own. It was also tested across 12 health behaviours (Prochaska et al., 1994) and has been applied across at least 48 health behaviours and populations globally (Prochaska, Redding, & Evers, 2008). In the TTM, six stages of change were initially identified: precontemplation, contemplation, preparation, action, maintenance and termination. These stages were further reduced to four main stages: precontemplation, contemplation, action and maintenance (Kerns et al., 1997) and were applied in research related to people with chronic pain conditions (Guite, Logan, Simons, Blood, & Kerns, 2011; Kerns et al., 2005; Neilson, Armstrong, Jensen, & Kerns, 2009; Strand et al., 2007).

There are important similarities between stages in the present framework and the TTM (see Figure 5.2). When a client is willing to listen, this can be interpreted as moving from the precontemplation stage to the contemplation stage in TTM. When the client is willing to try suggested changes to her or his housework routine, this can be interpreted as moving from the contemplation stage to the action stage in TTM. When the client is willing to incorporate these changes into his or her daily routines, they can be understood as moving from the action stage to the maintenance stage in TTM.

Despite the popularity of TTM, one criticism notes the difficulty in applying this model to more complex behaviours (Adams & White, 2005; Brug et al., 2005). As housework encompasses a range of different behaviours in multiple tasks, there is a degree of complexity in terms of meanings, compared to a single behaviour such as

cigarette smoking. The differences between the present framework and TTM could very well reflect this issue.

The first difference is the additional level of contemplation in the present framework as compared to TTM. The present framework indicates that clients need to be willing to incorporate changes into their routines before they could reach the maintenance stage. This reflects a second level of contemplation not addressed in the TTM. In the TTM, contemplation identified only prior to preparation, and it was not shown again between the stages of action and maintenance. With behaviours such as housework, which involves various tasks and skills, even when clients have decided to attempt a change, a less than satisfactory experience during the trial period (when they need to learn new knowledge and skills) can easily stop them from making the change permanent.

The second difference is the construct of 'ability' in the present framework, which is not identified in the TTM. This construct refers to clients' ability to understand information, recall information and problem solve at different stages of change. This construct is related to the clients' ability to process complex information during education. In the present study, therapists perceived that, even though a client was willing to change, they had to have the corresponding ability to successfully carry out the action at each stage of change. These abilities are especially important in more complex behaviour such as housework.

The third difference is an additional stage of action identified in the present framework, which is absent in the TTM. In the present study, therapists perceived three distinct stages of action in the education process. They are 'listening', 'trying' and 'persevering'. In the TTM, stages are a mixture of cognitive decisions and actions, with only two stages of actions identified. While 'trying' and 'persevering' in the present

framework can be understood as equivalent to action and maintenance in the TTM, 'listening' was absent in the TTM. The main reason for this additional stage could be because making changes in housework requires skills to learn multiple tasks. As such, it requires a client's active listening to learn knowledge before they incorporate changes at home; thus, the additional stage of 'listening'.

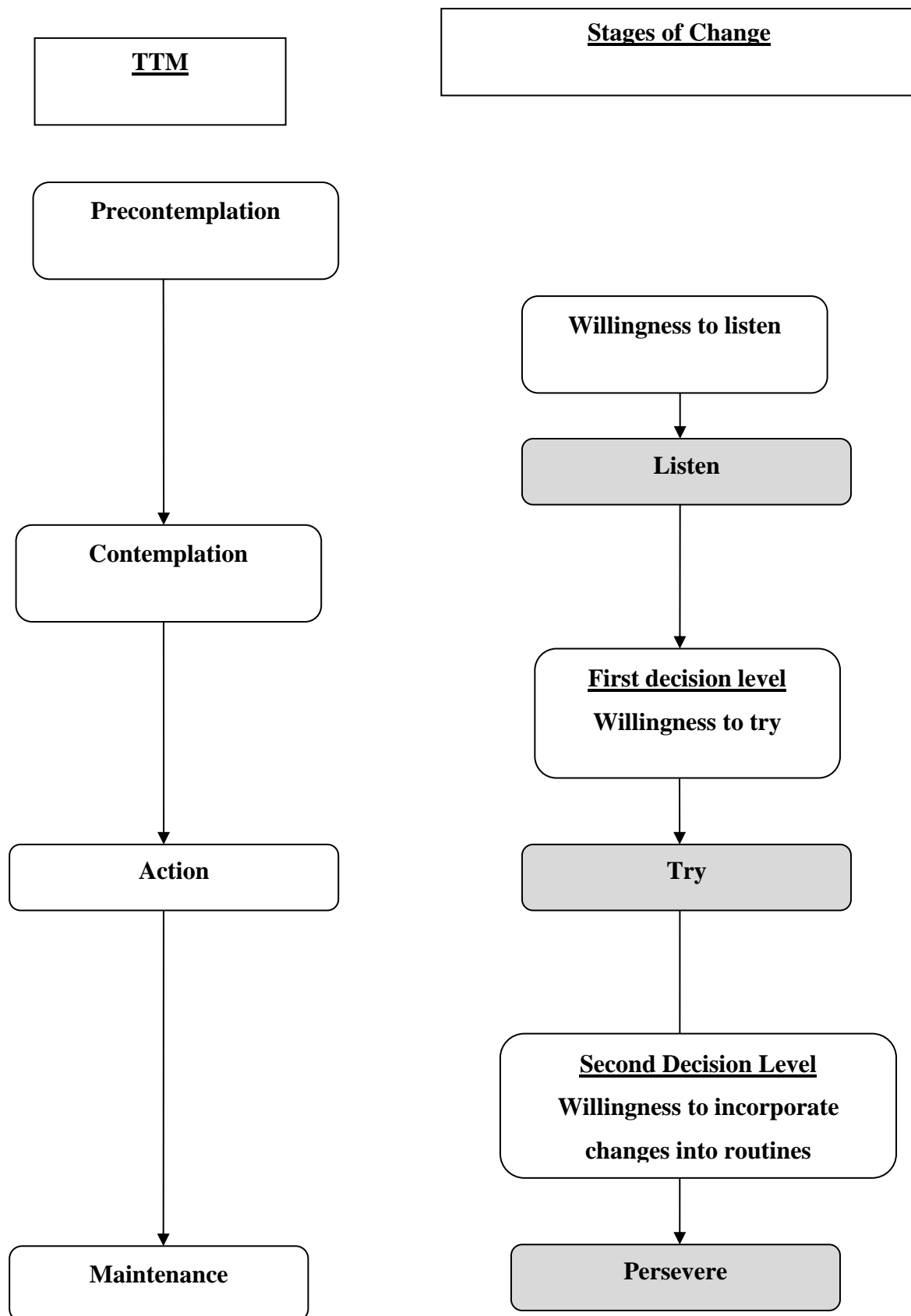


Figure 5.2. Stages of change in housework for women with upper limb RSI and the TTM.



### **5.10.2 A challenge to the clinical reasoning process—therapist credibility.**

Therapists in the present study perceived that clients' doubt about their credibility as a therapist was the main challenge to their clinical reasoning process. They felt that clients' trust (or doubts about their credibility) directly affected their ability to facilitate a positive expectation of change, and thus their clients' willingness to make actual changes to housework routines. This perception is consistent with the results of a randomised controlled trial on 167 patients with chronic lower back pain by Smeets et al. (2008). This study found that, although credibility and treatment expectancy were two separate constructs, they were highly correlated. Therapists in the present study also perceived that when clients had positive expectations of change, they would also be more willing to make changes according to their recommendations and would improve faster. This is consistent with many studies in the literature. These studies found that high treatment expectancy from patients would lead to positive clinical outcomes, such as functional improvement (Kalauokalani, Cherkin, Sherman, Koepsell, & Deyo, 2001; Myers et al., 2008), better pain coping, higher activity tolerance, and higher health related quality of life (Goossens, Vlaeyen, Hidding, Kole-Snijders, & Evers, 2005). This could be because clients' positive expectations of a change could encourage a positive attitude towards making a change to manage their condition; hence, their willingness to change and their actions in making a change, ultimately resulting in better outcomes.

In the present study, therapists perceived doubt from their clients regarding their expertise in providing advice on housework, which affected their clients' willingness to make changes according to their recommendations. According to Hovland, Irving, and Harold (1953), expertise refers to the message recipients' (client) perception of the extent that the message deliverer (therapist) is capable of giving a correct message. In a

meta-analysis of 114 communication and persuasion research papers by Wilson and Sherrell (1993), the findings were consistent with this perception of the therapists. In the study, Wilson and Sherrell (1993) found that credibility was multidimensional; expertise, compared to other dimensions of credibility, had the greatest effect on the message recipients' attitude.

Therapists in the present study perceived that their age and life roles (that resulted in their relatively limited housework experience when compared to their clients) were the two main reasons for their clients' doubting their credibility. In psychotherapy research, two types of credibility were suggested by Sue and Zane (2009): ascribed and achieved credibility. Ascribed credibility is a result of patients' perception of the therapists' positions or roles (such as age and gender), according to cultural norms; achieved credibility refers to the perception of competence level of the therapists, according to their skills and actions during therapy. According to a study by Hoyt (1996), therapists' characteristics could result in a lower ascribed credibility as defined by Sue and Zane (2009), which is consistent with the perceptions of the therapists in the present study.

Although therapists could not change their age or life roles, they could strive to improve their clinical actions (recommendations of advice) during ergonomic education on housework. In other words, when therapists perceived doubts from their clients towards their ascribed credibility, they could strive to improve their achieved credibility through clinical actions. The importance of clinical actions on a client's behaviour change is supported by the results of a meta-analysis by Hoyt (1996). Hoyt found a strong correlation between clinical actions and credibility, as well as credibility and clinical outcomes. From the review of 139 studies on psychotherapy programs, Hoyt (1996) found that between clinical actions and credibility, both verbal and non-verbal

behaviour (the way that therapists interacted with their clients) proved to be the most effective in raising therapists' credibility. On the relationship between credibility and influence, he also found a strong correlation between perceived therapist credibility and three measures of therapeutic outcomes, including patient satisfaction, attitude change and behaviour change. Thus, within the context of the present study, for therapists to facilitate a client to make a change in housework, they needed to adjust the way they interacted with clients accordingly, before they could facilitate change and achieve desired outcomes.

Most therapists in the present study found it difficult to devise appropriate ways to interact with their clients to improve perceptions of their credibility as a therapist, forming a major gap in their clinical reasoning. According to Schell (2009), the underlying cognitive processes of clinical reasoning is problem solving and the decision making process. Problem solving is a process where therapists combine theory with their personal and professional experience, to understand their clients' situations. As ergonomic education on housework not only relied on therapists' clinical experience, but also tapped heavily into their personal housework experience, therapists' personal experience in housework exerted an important influence on their clinical reasoning process.

In the present study, while many therapists grew up in households where maids were responsible for most housework, their clients grew up in households where housework was still mainly carried out by their mothers. This reflected the existence of a generational issue between the therapists and their clients. Therapists in the present study were mostly at an age equivalent to the daughters or granddaughters of their clients. According to the findings of the GT study on women with upper limb RSI (see Chapter 4), women considered housework a burden to their children if it distracted them

from other more important priorities in life, such as study and career. Therapists' low housework participation could be a result of similar parental attitudes in their own home. According to a study by Goh and Kuczynski (2012) with 19 Chinese families, parents in these households considered housework a distraction to academic work, contributing to their children's low housework participation.

As discussed in Chapter Four, women with upper limb RSI attached more meanings to housework and developed a deeper emotional attachment to it after they participated intensively when they had their own families. As such, the therapists' low participation in housework could be the reason for their lack of a deeper understanding of the meanings their clients attached to housework. The development of the women's perception in meanings related to housework through childhood, adolescence and adulthood form the development of their role identities through these stages (Kroger & Green, 1996; Waterman, 1982). These are then organised into a system representing the women's self (Stryker, 1968; Stryker & Serpe, 1994). As the OTs in the present study participated in less housework when they were young, it is very likely they would also perceive housework very differently from women from an earlier era.

While therapists did not understand, or fully consider the meanings their clients attached to housework in the clinical reasoning process, they would approach and conceptualise the issues at hand very differently from their clients, interacting with them differently. This could affect the success of the education programme. Many studies supported the importance of a match between therapists and clients on treatment outcomes. According to Sue and Zane (2009), achieved credibility can be measured in three areas: conceptualising the problem, coping orientation (or means for problem resolution), and goals for treatment. They believe that a match between therapists and clients in all these areas will predict better credibility and thus better treatment

outcomes. A study carried out by Zane et al. (2005) on a population of 60 clients and their therapists/treatment personnel from a mental health agency in San Francisco also provided consistent evidence. In the study, they found that a client-therapist cognitive match in problem conceptualisation, coping orientation and treatment goals resulted in positive treatment outcomes and session impact. Although this study was conducted on clients with mental health issues, it provides evidence to suggest the importance of a problem conceptualisation match between a therapist and a client in the success of a treatment programme aiming to change behaviours. Another study on 127 pairs of diabetic patients with their physicians found that agreement on treatment goals, and the strategies used to achieve these goals, was associated with improved clinical outcomes such as self-efficacy and diabetes self-management (Heisler et al., 2003). While therapists in the present study conceptualised the goal as facilitating their clients to make a change in housework, they only considered the clients' perspective on housework when the clients refused to change. Also, according to the findings in Chapter Four (and the present chapter), the therapists may not have even considered the variety of factors their clients used when conceptualising their therapy goal. The full range of meanings their clients attached to housework is one of these factors. This directly affects how therapists interacted with clients, and thus their clients' willingness to make changes in housework according to their advice.

### **5.10.3 A challenge to the clinical reasoning process—clinical environment.**

In the present study, therapists thought the clinical environment did not provide enough time to conduct ergonomic education on housework for their clients. This is consistent with the findings of a study by Lemon et al. (2004), who found that lack of time was one of the three greatest obstacles for dieticians needing to follow up with patients to monitor the outcomes of a nutrition intervention programme. Therapists also

perceived this would affect their clients' willingness to change, and directly affect the programme's success. In a meta-analysis by Norris, Lau, Smith, Schmid, and Engelgau (2002), with 31 studies on education programmes for patients with diabetes, they found intervention effectiveness improved with increased contact time between participant and educator. Although therapists in the present study believed it was important to spend sufficient and dedicated time with their clients to listen and communicate to give relevant and practical advice, they thought the current clinical environment did not enable this. Limited time, as an organisational barrier to an effective session of client education, was a common issue shared by various health professionals (Brandes, Wunderlich, & Niehues, 2011; Hammond & Klompenhouwer, 2005; Kushner, 1995). When the lack of time was an issue that could not be changed in most circumstances, therapists worked within limitations. This is consistent with the approaches of other health professionals in similar situations. Some tried to adapt established intervention strategies to shorter versions that were less time consuming (Rollnick, Heather, & Bell, 1992; Rundell & Davenport, 2010); others used videotaped instructions (Green, McInerney, Biesecker, & Fost, 2001; J. Miller, Stanley, & Moore, 2004).

In the present study, therapists also perceived that due to the space limitation, there was a lack of privacy when they attended clients. This made it difficult for them to listen and communicate with their clients. These therapists perceived that a higher degree of privacy would enable clients to disclose more relevant information. In turn, this would result in greater willingness to change. The study by Holahan and Slaikeu (1977) on 74 volunteers (22 males and 52 females) confirmed this perception. With the volunteers assigned to three different counselling settings, with varying degrees of privacy, Holahan and Slaikeu (1977) found that reduced privacy indeed decreased client self-disclosure.

#### **5.10.4 Client-centred approach in a biomedical environment.**

The limitation of time and space in the clinical environment perceived by the therapists in this study could possibly result from a hospital predominantly adopting a biomedical model, forming a culture that influenced both inpatient and outpatient practice. As pointed out by Barris (1987) and Townsend (1996), in their studies of occupational therapy practice in psychosocial or mental health settings, context shaped the practice of OTs. In a biomedical environment, OTs faced challenges in carrying out interventions that represented the true essence of the profession. While a biomedical model of illness embraces reductionism and believes that patients are passive recipients of treatment with little or no responsibility for the presence or cause of illness (Wade & Halligan, 2007), occupational therapy embraces an organismic philosophy that focuses on personal choices, with clients participating and taking responsibility for managing their health issues (Blanche & Henny-Kohler, 2000). Two studies on occupational therapy practice in acute care physical settings reported this specific challenge faced by OTs who worked in a predominantly biomedical environment (Wilding & Whiteford, 2007, 2008). As such, even though client-centred practice is the central philosophy of occupational therapy practice, the environmental constraints imposed by a biomedical environment can make it difficult for therapists in the present study to conduct their clinical reasoning process accordingly. In a qualitative study that explored ten OTs' decision making on the long term care for some older people in an acute hospital, Moats (2006) also found that in an environment with a predominantly biomedical model, the pressure to make fast decisions imposed threats to client-centred processes.

Based on a review by Sumsion and Law (2006), power is the central theme of a client-centred practice, in which both therapists and clients are engaged in an interdependent relationship, where both therapists and clients are considered experts,

instead of a dependent therapist-patient relationship. In the present study, although some therapists considered learning from their clients during education, reflecting their recognition of the clients' expertise in the relationship, most focused more on the knowledge they could gain for future clients, instead of trying to achieve an interdependent relationship with their current clients.

According to the same review, the five main conceptual elements of a genuine client-centred approach identified included listening and communicating, partnership, choice and hope. (Sumsion & Law, 2006). The findings of this study showed a lack of 'listening and communicating' from therapists during ergonomic education. They did not manage to listen and communicate with their clients sufficiently. Thus, they did not fully appreciate how their lack of understanding of their clients' perceived meanings in housework affected their credibility and hence their clients' willingness to change. Also, although some therapists considered involving their clients in a partnership to create solutions regarding housework, they tended to appease their clients by providing them with recommendations in a more didactic manner; thus, departing from a true client-centred approach.

### **5.11 Chapter Summary**

In this chapter, I have presented and discussed the findings of Study II, and formulated a conceptual framework of therapists' perceptions of clients' stages of change when conducting housework ergonomics education for women with upper limb RSI. The results of this study indicate that a model to guide the implementation of housework education for women with upper limb RSI in Singapore should consider the following three main areas. First, it has to consider the unique stages of change for this group of clients. Second, it has to consider the therapists' understanding of meanings



that their clients attach to housework. Third, it has to consider the limitations in a busy biomedical clinical environment to a client-centred practice.

Findings from this study also showed that most therapists conduct ergonomic education without truly orientating their practice towards a client-centred approach. As such, they also perceived credibility narrowly, and did not see beyond this to perceive their expertise more broadly and understand more about the meanings their clients attach to housework. Although therapists demonstrated that their tacit knowledge of 'change' happens in stages, none managed to explicitly articulate the use of a stage theory. In the next chapter, findings from Chapters Four and Five will be integrated to construct a model of behaviour change related to housework activities for women with upper limb RSI.

## **Chapter 6: A Model of Behaviour Change in Housework**

### **6.1 Introduction**

Health behaviour models usually draw on more than one theory to understand a specific health behaviour within a specific context (Glanz et al., 2008). Within the context of ergonomic education on housework for women with upper limb RSI, two conceptual frameworks were constructed from the findings of two GT studies, described in Chapters Four and Five. In this chapter, relevant constructs from the two frameworks with their relevant findings will be integrated into a model of behaviour change that could be applied to ergonomic education on housework for women with upper limb RSI.

### **6.2 A Conceptual Framework—Women’s Decision Making in Housework**

There are three major constructs in this framework related to decision making and behaviour change in housework among women with upper limb RSI. The related findings of each construct are described below.

#### **6.2.1 Emotional attachment to housework.**

- Despite differences in the meanings that clients attach to housework, most participants show strong emotional attachment to their housework habits and routines.
- They expect housework to be done speedily and to a high standard, which becomes a major barrier to them making a change in housework.

#### **6.2.2 Cognitively informed decision.**

- *Necessity of the change*—clients make decisions based on their own experience of pain and their knowledge of other people’s experience of pain.

- *Possibility of the change*—clients make decisions based on their specific situations of financial resources and family support.

### **6.2.3 Emotional decision.**

- *Acceptability of the change*—clients make decisions based on whether the suggested change imposes a threat to their perceived meanings of housework and the developed routines in housework, threatening their emotional attachment to housework habits and routines.

## **6.3 A Conceptual Framework—Therapists’ Clinical Reasoning**

### **Process**

There are three major constructs in this framework related to therapists’ clinical reasoning processes and behaviour change in housework among women with upper limb RSI. The related findings under each construct are described below.

#### **6.3.1 Stages of change.**

- Therapists perceive that their clients transit through various stages of actions and they have to plan their strategies according to these stages.
- At each stage of change, therapists perceive they have to facilitate their clients’ ability and willingness to change.

#### **6.3.2 Challenge to therapists’ credibility.**

- Therapists encounter major difficulties in trying to facilitate their clients’ willingness to change, due to the clients’ doubts about their expertise in providing advice in housework.
- A main reason for these difficulties is the therapists’ lack of deeper understanding of meanings clients attach to housework.

### **6.3.3 Clinical environment as a challenge.**

- Therapists perceive that the limited time and space imposed by the clinical environment threatens the use of a client-centred approach in their clinical reasoning process.

## **6.4 Constructs in the Model of Behaviour Change in Housework**

Based on the major constructs and findings from the two GT studies related to behaviour change in housework among women with upper limb RSI, four constructs, five components and ten factors related to behaviour change in housework are selected and included in the model (see Table 6.1). While the model constructs are selected from those within the two frameworks, the construct of ‘emotional decision’ is subsumed within the construct of ‘emotional attachment to housework’. According to the study described in Chapter 5, it was indicated that women made decisions on housework based on whether the changes advised by the therapists are emotionally acceptable. If the advice was perceived by the women as the opposite of what they wanted and expected from housework, threatening their self-identity and emotional attachment to established habits and routines, the less emotional acceptable they would perceive the change and less likely they would make a decision to change.’ Also, a construct called ‘client-therapist interaction’ addresses the construct of ‘challenge to therapists’ credibility’. If therapists manage to address the meanings behind their clients’ habits and routines, the factors their clients use to make cognitively informed decisions, and the specific stage of change each client is at, they can then interact with their clients so those clients perceive them as credible.

Table 6.1

*Constructs, Components and Factors Selected for the Model*

<b>Constructs</b>	<b>Components</b>	<b>Factors</b>
Client-therapist interaction	Therapists' credibility	All factors identified below
Clinical environment	Available resources	Available time Available space
Stages of change	Actions of change	Clients' willingness to change Clients' ability to change
Cognitively informed decisions	Necessity of change	Clients' pain experience Clients' knowledge of other people's pain experience
	Possibility of change	Clients' financial resources Clients' family support
Emotional attachment to housework	Acceptability of change	Clients' perceived meanings of housework Clients' habits and routines

## **6.5 A Model of Behaviour Change in Housework for Women with Upper Limb RSI**

Based on the findings of the two GT studies, and the relationships of the constructs within the two conceptual frameworks described in Chapters Four and Five, the constructs selected for the model of behaviour change in housework and their relationships are represented in Figure 6.1.

There are three main indications of this model. First, the model indicates that women go through different stages of action before they finally incorporate changes in housework into their routines. From the therapists's perspective these action stages include 'listening', 'trying', and 'persevering'. For each stage of action, therapists need to facilitate the women's willingness, as well as their ability to carry out the action, and

they are influenced by various factors under the construct of ‘emotional attachment to housework’ and ‘cognitively informed decisions’.

Second, the model indicates that although women attach meanings to housework from five common categories, there are differences in the meanings these women attach to housework. Despite these differences, most show an emotional attachment to their housework habits and routines, expecting housework to be done speedily and to a high standard. As such, most would also find a change to housework routines that affected their speed and standards emotionally unacceptable, and would also become unwilling to change.

Third, the model indicates that when women perceive that the recommended changes are unnecessary and impossible, they are also unwilling to make changes. This depends on four main factors, and they are different for each woman. These are: family support, financial resources, their own pain experiences and their knowledge of other people’s pain experiences. The main essence of the model lies in its emphasis on the individuality of each woman (the different factors they use to make decisions related to changes in housework and the different stage of change that each woman is at) and the importance of client-therapist interaction in women’s willingness to change, as influenced by the therapists’ understanding of these factors and the clinical environment.

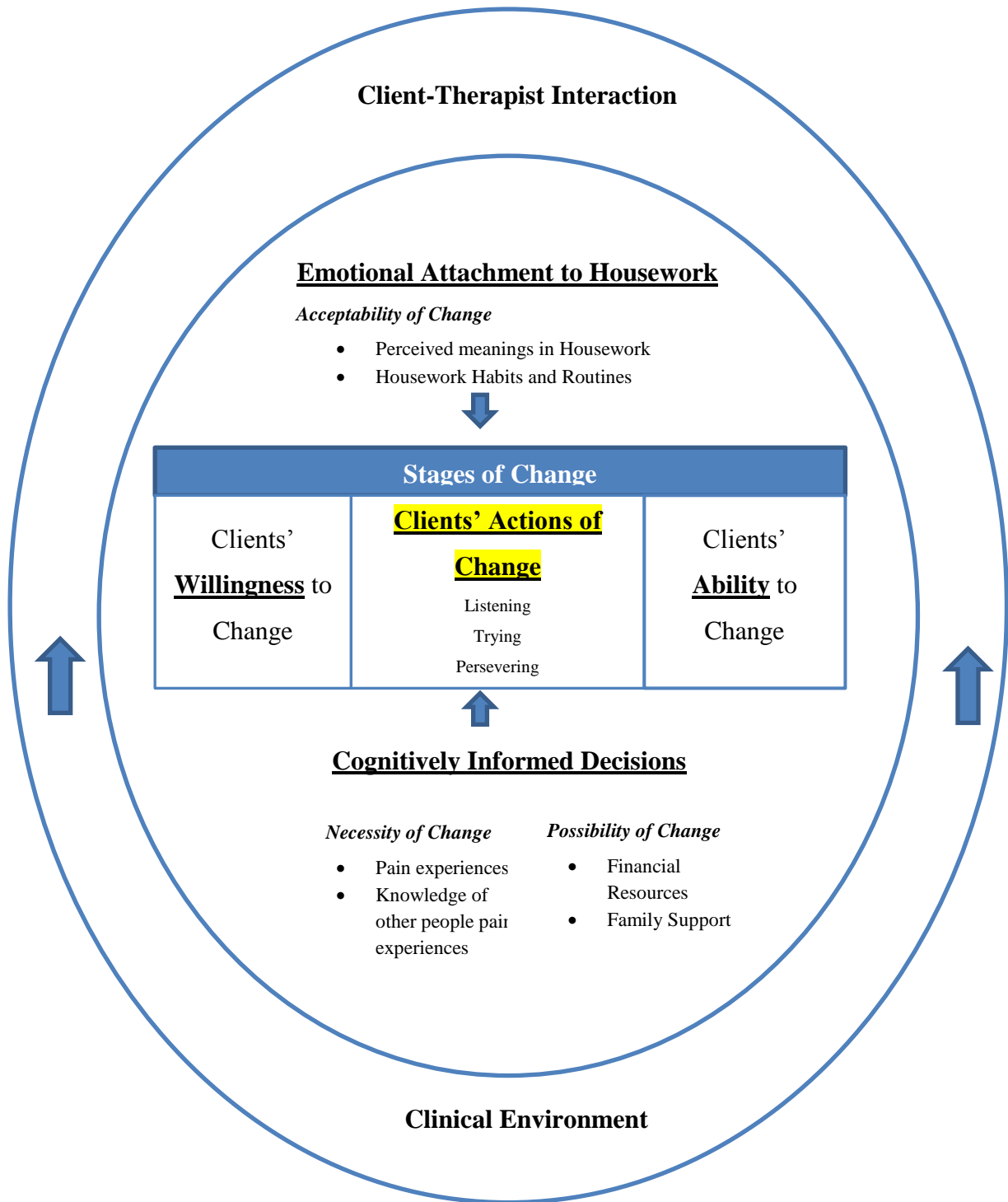


Figure 6.1. A model of behaviour change in housework for women with upper limb RSI.

## 6.6 Client-Therapist Interaction

According to a qualitative study on 18 people in Scotland with Type 1 or 2 diabetes (Entwistle, Prior, Skea, & Francis, 2008) client-therapist interaction includes two aspects. First, it is the ethos and feel of the interaction: patients mainly focus on the manners and actions of health practitioners and how these make them feel (Entwistle et al., 2008). Second, it is the content of the interaction: this includes interaction about the health problems and interaction about the treatment options (Entwistle et al., 2008).

Client-therapist interaction is central to the success of any health care intervention. A survey by Knight, Cheng, and Lee (2010) on 320 clients from 25 physiotherapy clinics in the Sydney metropolitan area found that client-therapist interaction was most frequently reported as the reason for dissatisfaction. Dissatisfied clients change health providers. For women with upper limb RSI, this dissatisfaction could lead to an unwillingness to follow therapists' advice on making changes to housework.

The model suggests the important effect of the clinical environment on client-therapist interaction. This includes factors such as the physical environment of a clinic (Holahan & Slaikeu, 1977; Miwa & Hanyu, 2006) and the time available within a specific clinical context (Brandes et al., 2011; Wilkins, Pollock, Rochon, & Law, 2001). Despite challenges that may exist in a clinical environment, the present model emphasises the crucial effect of the therapists' understanding of their clients on client-therapist interaction during ergonomic education.

According to the present model, when therapists understand the reasons behind their clients' emotional attachment to housework, and the factors their clients use to make cognitively informed decisions on changes in housework, they will also interact with their clients in a way perceived as positive. As such, the clients will also be more



willing to participate in the ergonomic education and make changes to their housework. This is supported by the study carried out by Entwistle et al. (2008). This study found that when clients felt listened to, when they understood the information and when the ethos of the interaction was respectful and non-judgemental, they also had a sense of involvement in treatment decisions (Entwistle et al., 2008). This is an important component that facilitates client participation in health care intervention. Other studies also confirmed the importance of client-therapist interaction on the clients' perception of a health care intervention. This includes the perception of whether they are receiving a caring service (Widar, Ek, & Ahlstrom, 2007) or if they are being respected (Donohue, 2003).

A congruent belief between clients and therapists is a major determinant of the success of a client education programme. A study of 45 physicians and 909 of their patients on patient centred beliefs found that when the beliefs of the physicians and their patients are congruent, the patients are also more likely to trust their physicians. Although therapists and women with upper limb RSI may not share the same beliefs and values regarding housework, this congruency can be achieved through a channel provided by the present model. That is, through client-therapist interaction. When therapists gain a deeper understanding of their clients, they will interact with them differently and clients will also perceive their therapists as more credible. As such, they will also be more willing to take action to change.

## **6.7 Chapter Summary**

In this chapter, I have presented a model of behaviour change in housework for women with upper limb RSI that can be used to guide ergonomic education on housework. In the next chapter, I will compare findings from the two GT studies that identify a gap in therapists' clinical reasoning process. This affects their interaction

with clients when they conduct ergonomic education on housework. The development of an assessment tool to address this gap will then be presented and a pilot study that investigates its validity will also be described.

## **Chapter 7: The Development of an Assessment Tool and a Pilot**

### **Study**

#### **7.1 Introduction**

This chapter has two parts. Part I describes the background to, and the development of, an assessment tool to collect information from women with upper limb RSI regarding their willingness to make changes in housework. Part II presents a pilot study conducted to investigate the validity of this assessment tool.

#### **7.2 Part I—The Development of an Assessment Tool: The Behaviour Change in Housework Assessment (BeCHA)**

This research has identified a gap in therapists' clinical reasoning process. This gap lies in the therapists' lack of understanding the meanings women attach to housework that influence both their decision making regarding change, and their willingness to make changes. The researcher determined that an assessment tool grounded in the knowledge developed by this research may assist therapists in interactions with clients, and the therapy approach they use during ergonomic education. The rationale and method used for the development of different sections in the tool will also be described.

##### **7.2.1 The need for an assessment tool.**

Based on the findings from the GT study of women with upper limb RSI described in Chapter Four (Study I), women make decisions on housework by considering the necessity, possibility and acceptability of a change. When women considered that changes are necessary, possible and acceptable, they would make a decision to change. When a woman makes a decision to change, this reflects their willingness to change.

Based on the findings from the GT study of OTs who conduct ergonomic education on housework for women with upper limb RSI, described in Chapter Five (Study II), a major issue therapists encounter is how to facilitate clients' willingness to change, especially when doubt in their expertise to provide advice on housework was observed in clients' behaviour. As such, findings from both studies revolve around the same issue. That is, the clients' willingness to make changes in housework.

Based on a comparison of the factors used by women with upper limb RSI to make decisions regarding changes in housework, as described in Chapter Four, and the strategies reported by OTs when they conduct ergonomic education on housework, as described in Chapter Five, three areas of women's concern are not addressed by any strategy reported by the OTs who participated in the study. (see Table 7.1)

As illustrated in Table 7.1, three factors that women with upper limb RSI use to make decisions about changes in housework are not addressed by any strategy reported by the OTs. This could be due to the limited time and space within the clinical environment, as reported by therapists in Study II. Therapists noted that these constraints make it difficult to 'listen and communicate' with their clients sufficiently to discover information relevant to each of them. To assist therapists in this area, an assessment tool is needed to help them collect information from clients systematically and efficiently. However, up to date, no such assessment tool is available to assist therapists systematically obtain information from women with upper limb RSI on their willingness to make changes in housework during ergonomic education.

Table 7.1

*Comparison of Perceptions between Women with Upper Limb RSI and Strategies Used by OTs*

<b>Decisions/willingness changes in housework</b>	<b>Women with upper limb RSI factors in decision making</b>	<b>OTs' reported strategies</b>
Necessity of change—the link between pain and housework	Own pain experience	Explain the consequences of their condition without making changes  Provide opportunities for the clients to try out certain labour saving devices and experience pain relief
	Other people's pain experience	X
Possibility of change	Financial resources	Suggest labour saving devices that are cheap
	Family support	X
Acceptability of change	Meanings attached to housework	X
	Housework habits and routines	Advise gradual changes to make the changes more acceptable

X—Not addressed in any strategy mentioned by the therapists

### **7.2.2 Procedures for the development of the assessment tool (BeCHA).**

The BeCHA is a self-report assessment tool. Its purpose is to assist OTs in collecting important information from clients for their clinical reasoning during ergonomic education on housework in a systematic and time efficient way. The tool consists of three parts and was developed based on the model of behaviour change in housework for women with upper limb RSI, and the findings from the two GT studies described in Chapters Four and Five. Section A of the tool collects basic demographic information from clients and specific information on their home situations. Section B is the Scale of Motivational Readiness to Change Housework (SMR-HW), which collects

information on clients' stages of willingness to change. This determines their level of motivational readiness to make changes in housework. Section C collects information on the clients' ranking of barrier statements related to making changes in housework.

#### ***7.2.2.1 The format of the tool—self-reported assessment.***

According to the model of behaviour change in housework, the clinical environment is an important factor to consider in the planning of an ergonomic education programme on housework. Within the context of a busy occupational therapy outpatient clinic, there can be major limitations in terms of the physical environment and time available to conduct education according to the presented model. To collect information efficiently and simultaneously allow some privacy, a self-reported format that can be completed independently by clients was most appropriate for the assessment tool. This format is not only time efficient for both the therapist and client, it will also afford a certain level of privacy, as it will reduce the risk of information being overheard by other clients in an open clinic.

#### ***7.2.2.2 The development of Section A—basic information.***

The ten questions in this section aim to collect information related to the clients' housework situations at home (Table 7.2). Apart from basic questions on clients' marital status and property type, all other questions focus mainly on the amount of housework that clients need to carry out at home, the amount of time available to carry out this housework and if there is any support that might be available to them for housework.

Table 7.2

*Section A of BeCHA—Basic Information*

<b>Section A (basic information)</b>	<b>Circle an answer or fill in the blank</b>
1) What is your current marital status?	Single Married Divorced
2) How many family members are currently living with you? What kind of residence do you live in?	( ) People Housing Development Board (HDB) Private apartment/condominium Landed property
3) Do you have a paid job?	Yes No (Please go to Q 6)
4) How many hours per week do you spend in your paid job?	Full time (40 hours or more) Part time ( ) hours
5) How many hours do you spend doing housework per week?	More than 26 hours Between 20–26 hours Between 15–20 hours Less than 15 hours
6) How much of the housework do you need to do at home?	25% 50% 75% All
7) Do you have a maid to help you with your housework? If yes, please circle the portion of housework your maid does per week.	Yes (25%, 50%, 75%, all)  No
8) Do other family members help with housework?	Yes No
9) Do you have child/children (below 18 years old) or an elderly family member at home that you need to take care of? If yes, please circle the age range of your children. You can circle more than one range.	Yes (age<13, 13<age<18)  No

### *7.2.2.3 The development of Section B—the SMR-HW.*

Based on the model of behaviour change in housework and the findings of the GT study of OTs (see Chapter 5), women with upper limb RSI go through three main stages of willingness to change: willingness to listen, willingness to try and willingness to persevere. As the model also indicates that women's decisions influence the clients' willingness to move through the different stages of change, information is most appropriately collected in terms of decision stages, to reflect the clients' willingness to change.

#### *7.2.2.3.1 The development of stages.*

As there are a lot of similarities between the clients' willingness to change and the TTM (DiClemente & Prochaska, 1982; Prochaska, 1979; Prochaska & Di Clemente, 1982; Prochaska et al., 1994), and many tools have already been developed based on the TTM, my initial intention was to adapt an existing tool from one of these to collect information under this construct. Among the tools developed based on the TTM of behaviour change, Pain Stages of Change Questionnaire (PSOCQ) could possibly be adapted for women with RSI, as it is a tool designed specifically for people with chronic pain conditions (Kerns & Rosenberg, 2000; Kerns et al., 1997).

The PSOCQ is a questionnaire consisting of 30 items that measure chronic pain patients' readiness to adopt a self-management approach to manage their condition. Each item has an ordinal scale of 1–5 from 'strongly disagree' to 'strongly agree' (see Appendix 12) (Kerns et al., 1997). The scale was adapted and validated for use in pediatric chronic pain (Guite et al., 2011), and in another language (German) (Maurischat, Harter, Auclair, Kerns, & Bengel, 2002). Despite certain limitations of its use for people not treated in a pain clinic (S. Habib, Morrissey, & Helmes, 2003), extensive evidence exists supporting its validity and clinical use for people with chronic



pain conditions (Carr, Moffett, Sharp, & Haines, 2006; Kerns & Rosenberg, 2000; Kerns et al., 2005). However, considering the clinical environment of a busy and fast-paced acute outpatient setting, this tool may prove too lengthy and time consuming. Also, the tool does not use the decision stages to indicate clients' willingness to change, and hence does not fully reflect the present model. With this consideration, the assessment tool based on another stage change theory, the Precaution Adoption Process Model (PAPM) (Weinstein, 1988; Weinstein & Sandman, 1992; Weinstein et al., 2008) is more suitable for adaptation to collect information about clients' willingness to change within such a clinical setting.

PAPM is a prominent staged theory of behaviour change developed by Weinstein (1988), and its stages parallel those of the TTM. In the PAPM, a total of seven stages are identified: unaware of issue, unengaged by issue, undecided about acting, decided not to act, decided to act, acting and maintenance (Weinstein et al., 2008). PAPM not only uses decision stages in its staging algorithm (see Appendix 13) (Weinstein et al., 2008), which is consistent with the construct in the present model, it also considers both recent past behaviour and intention (decision making) in the near future. This is a desirable factor in the design of a staging algorithm when applying stage change theory to more complex behaviour such as exercises (Godin, Lambert, Owen, Nolin, & Prud'homme, 2004), and in the present model, housework.

Based on the stages of clients' willingness to change identified by the OTs (see Chapter 5), and using the format and logic of PAPM's decision stages, 12 decision stages for women with upper limb RSI were identified to reflect their willingness to make changes in housework (see Table 7.3). Although 12 decision stages were identified, stages two and three were not included, as those who are 'aware of the situation' and 'concerned about it' should immediately proceed to the various stages of

decision making. As such, a total of ten stages were identified (see Table 7.3). Based on the statements of stages in PAPM, the ten stages identified were transformed into statements that were easily understood.

#### *7.2.2.3.2 Expert review.*

These ten stages were next ranked by six senior therapists according to their perception of clients' level of motivational readiness to change housework during ergonomic education.

Among the six senior therapists, five had more than ten years of clinical experience and were considered as functioning at an expert level (Schell, 2009). One has more than five years' experience and were considered as functioning at a proficient level (Schell, 2009). All six therapists agreed on the ranking of all stages, except stages two, four and seven. Finally, it was agreed that although each of these three stages should be identified separately due to the different counselling strategies needed, all should be considered as scale one, a group least willing to change. In the final version, eight scales are identified: scale one indicates clients that are the least ready to make a change, and scale eight means that the client has already completed the change successfully and satisfactorily (see Table 7.3).

#### *7.2.2.3.3 Final version of Section B (SMR-HW).*

Based on the eight levels of motivational readiness, and adopting the format of the staging algorithm used in the PAPM, the final version of SMR-HW was established (see Table 7.4).

Table 7.3

*Decision Stages Reviewed by Experts*

<b>12 decision stages based on the model</b>	<b>10 stages in the form</b>	<b>Motivational readiness scale</b>
Stage 1: Unaware of the link between the condition and housework	Stage 1: A health professional has not talked to me about changing the way I do my housework to manage my condition	Scale 2
Stage 2: Aware of the link between condition and housework	Not applicable	Not applicable
Stage 3: Concerned with the advice and condition	Not applicable	Not applicable
Stage 4: Not concerned with the advice and the condition	Stage 2: I have heard the advice and I have never thought about it	Scale 1
Stage 5: Deciding to try	Stage 3: I have heard the advice and I am still thinking about it	Scale 3
Stage 6: Decided not to try	Stage 4: I have thought about it but I have decided not to try the changes	Scale 1
Stage 7: Decided to try	Stage 5: I have thought about it and I have decided to try the changes	Scale 4
Stage 8: Deciding to make it permanent	Stage 6: I have tried the changes and I am thinking about carrying out these changes regularly	Scale 5
Stage 9: Decided not to make it permanent	Stage 7: I have tried the changes, thought about them but I have decided not to make them permanent	Scale 1
Stage 10: Decided to make it permanent	Stage 8: I have tried the changes, thought about them and I have decided to make them permanent	Scale 6
Stage 11: The change is permanent but not a habit yet	Stage 9: I have carried out the changes regularly but I forget to carry out these changes sometimes	Scale 7
Stage 12: The change has become a habit	Stage 10: I have carried out the changes and I do not forget carrying out these changes	Scale 8

Table 7.4

*Section B of BeCHA—Scale of Motivational Readiness to Change Housework (SMR-HW)*

<b>Questions</b>	<b>Answers and scale</b>
Has a health professional talked to you about changing the way you do housework to manage your problems?	Yes—Go to Q2
	No—Scale 2
Have you tried some changes to your housework?	Yes—Go to Q3
	No—Go to Q5
Have you carried out these changes regularly?	Yes—Go to Q4
	No—Go to Q 6
Do you sometimes forget to carry out these changes?	Yes—Scale 7
	No—Scale 8
What are your thoughts about trying some changes to your housework now?	I have never thought about changes—Scale 1
	I am still thinking about changes—Scale 3
	I have thought about it but I have decided that I don't want to try the changes—Scale 1
	I have thought about it and I have decided I want to try the changes—Scale 4
What are your thoughts about carrying out these changes regularly as part of your routine?	I am still thinking about carrying out these changes regularly—Scale 5
	I have thought about it but I don't want to carry out these changes regularly—Scale 1
	I have thought about it and I want to make it a routine—Scale 6

#### ***7.2.2.4 The development of Section C—14 barrier statements.***

According to the model of behaviour change in housework and the GT study of women with upper limb RSI (see Chapter 4), clients' willingness to change is influenced by their 'cognitively informed decision' and 'emotional attachment to

housework'. The 14 barrier statements in this section were formulated based on these two constructs.

#### *7.2.2.4.1 Formulation of barrier statements.*

Fourteen barrier statements were derived from the findings of the GT study of women with upper limb RSI, as described in Chapter Four (see Table 7.5). These statements were derived from the women's expressions identified from the interview data. This involved returning to the data and extracting statements that reflected the constructs 'cognitively informed decisions', and 'emotional attachment to housework'. These statements were then written as the 16 barrier statements in this section.

#### *7.2.2.4.2 Expert review.*

Two experts, the supervisors of this thesis, who are familiar with the two GT studies, were invited to review the statements and confirm that they reflect the findings in these studies.

#### *7.2.2.4.3 Final version of Section C—14 barrier statements.*

In the final version, three questions are asked with the 14 barrier statements as answers (see Table 7.6). The clients are instructed to give answers to these statements with rankings of 'strongly agree', 'agree', 'disagree' and 'strongly disagree'. No neutral answer is allowed, so that clients will indicate their agreement or disagreement with the statements.

Table 7.5

*Barrier Statements Reviewed by Experts*

<b>Constructs</b>	<b>Factors</b>	<b>14 barrier statements</b>
Cognitively informed decisions	Own pain experience	It cannot reduce my pain
	Other people's pain experience	I know people who don't need to change the way they do housework and they recover
	Financial resources	It is too expensive to make the change
	Family support	My family will not be happy about me changing the way I do my housework My family will not be happy if they need to do more housework because of my condition I don't have anyone to help me with my housework
Emotional attachment to housework	Habits and routines in housework	I cannot do my housework as quick as before I cannot do my housework as well as I did before I will forget to carry out the changes sometimes
	Meanings in housework	I will feel a loss of pride I will feel less burdened I will feel I am not fulfilling my responsibility I won't be able to meet the needs of my family I will impose burden on my family

Table 7.6

*Section C of BeCHA—14 Barrier Statements*

<b>Section C (barrier statements)</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly disagree</b>
1. How will you feel if you change the ways you do your housework?				
1.1 I will feel a loss of pride				
1.2 I will feel less burdened				
1.3 I will feel I am not fulfilling my responsibility				
1.4 I cannot do my housework as quickly as before				
1.5 I cannot do my housework as well as I did before				
1.6 I won't be able to meet the needs of my family				
1.7 I will impose burden on my family				
2. What do you think about changing the way you do your housework to manage your condition?				
2.1 I know people who don't need to change the way they do housework and they recover				
2.2 It cannot reduce my pain				
2.3 My family will not be happy about me changing the way I do my housework				
2.4 My family will not be happy if they need to do more housework because of my condition				
3. What difficulties do you think you might have if you change the way you do your housework?				
3.1 I don't have anyone to help me with my housework				
3.2 It is too expensive to make the change				
3.3 I will forget to carry out the changes sometimes				

### **7.3 Part II—A Pilot Study of the Assessment Tool BeCHA**

Before BeCHA is used in ergonomic education for women with upper limb RSI, the validity of SMR-HW in Section B and the 14 barrier statements in Section C of the tool requires investigation. As such, the present pilot study focuses on determining the psychometric properties of SMR-HW in Section B and whether women's ratings of the 14 statements in Section C are consistent with two patterns suggested by the model. First, most women would show a strong attachment to their housework habits and routines, expecting housework to be done speedily and to a high standard. As such, it is expected that most women would agree with the barrier statements 'I cannot do housework as good as before' and 'I cannot do housework as fast as before'. Second, each woman is different regarding their perceptions of barriers related to making changes in housework. Therefore, it is expected that these women's ratings of the 14 barrier statements in section C will show a pattern of diversity.

#### **7.3.1 Objectives.**

The pilot study had two objectives:

1. To examine the concurrent validity of SMR-HW, a component of the BeCHA by comparing it with a measure of 'stages of change' with people who suffer from chronic pain conditions.
2. To examine the construct validity of the 14 barrier statements in Section C of the BeCHA by determining:
  - a. If most women show strong attachment to their housework habits and routines
  - b. If women's overall rankings of these barriers to change show a pattern of diversity.



### **7.3.2 Hypotheses.**

The study addressed the first objective by testing the following hypothesis:

Hypothesis 1: The level of motivational readiness identified with the use of SMR-HW has a significant positive, moderate to strong correlation with that identified in the PSOCQ (Kerns & Rosenberg, 2000; Kerns et al., 1997).

The study addressed the second objective by testing the following hypotheses:

Hypothesis 2: A majority of women with upper limb RSI (>50%) will agree on the two barrier statements on housework habits and routines that are related to speed and standards in doing housework.

Hypothesis 3: There will be weak or moderate correlation among women's ratings of the 14 barrier statements reflecting diversity.

### **7.3.3 Methods.**

#### ***7.3.3.1 The participants.***

The participants were recruited from a convenience sample of clients referred to the hand therapy outpatient clinic of an occupational therapy department in a major acute care hospital in Singapore. It is the same clinical setting in which Study I and II (described in Chapter 4 & 5) were conducted. Those who fitted the following inclusion criteria were screened and invited to participate in the research by their attending OTs:

1. Women of Chinese ethnicity.
2. Experience of chronic pain for more than four months, with one or more upper limb RSI conditions according to the Swedish NIWL classification system (Sluiter et al., 2001).
3. Need to perform housework-based activities at home.
4. Able to speak read and write in English.

5. Have received, or are going to receive, education on changing housework-based activities to manage their conditions.

They were then referred to an onsite researcher who explained the details of the research and ascertained their consent to participate in the study.

#### ***7.3.3.2 Ethics approval and informed consent.***

Approval was obtained for the study by the Human Research Ethics Committee of the University of Sydney and the Centralized Institutional Review Board of a hospital in Singapore. The approval for the study, with its corresponding participant information sheets and consent forms, can be found in Appendices 14 & 15. Informed consent was obtained from all participants.

#### ***7.3.3.3 Confidentiality.***

All data were stored in a locked cupboard and accessible by researchers involved in the studies only. To protect the anonymity of the OTs who participated in Study II, only the ethics approval received from The University of Sydney was attached. The name of the institution has also been kept anonymous.

#### ***7.3.3.4 Data collection.***

Participants who fit the inclusion criteria, and were recruited during the period of May 2012 to June 2013, were asked to complete the BeCHA and the PSOCQ. Data were also collected on participants' demographic details and information related to housework participation at home. The time needed for each participant to fill in all the forms was approximately 45 minutes.

The PSOCQ consists of 30 items (Kerns et al., 1997). The items are grouped under the four stages of change (precontemplation, contemplation, action and maintenance) according to the TMM. There are seven items under 'precontemplation', ten items under 'contemplation', six items under 'action' and seven items under

'maintenance' (Kerns et al., 1997). Each woman was required to give a score (1–5) for each item based on five levels of agreement ('strongly disagree', 'disagree', 'neutral', 'agree' and 'strongly agree')(Kerns et al., 1997). The highest score classification system classified the women into one of the four stages of change (Dijkstra, 2005). A total score was calculated for the items under each stage, and each woman was then assigned to the stage with the highest score (Dijkstra, 2005). When the total scores of two or more stages were the same, the woman would be assigned to the more progressed stage (Dijkstra, 2005). There is extensive evidence exist to support the validity of PSOCQ in use for people with chronic pain conditions (Carr et al., 2006; Kerns & Rosenberg, 2000; Kerns et al., 2005).

The BeCHA is an assessment that consists of three sections. Section A collects basic information of the participants and specific information on their home situations. Section B is the SMR-HW, which collects information on the participants' level of motivational readiness to make changes in housework. There are eight scales in SMR-HW. Scale one indicates that participants are the least ready to make a change and scale eight means that the participant has already completed the change successfully and satisfactorily. Section C collects information on participants' ranking of barrier statements that are related to their perception of the necessity, possibility and acceptability of change. The participants were instructed to give answers to these statements with rankings of 'strongly agree', 'agree', 'disagree' and 'strongly disagree'. No neutral answer was allowed so that participants would indicate their agreement or disagreement with the statements.

#### ***7.3.3.5 Data analysis.***

All data was analysed with the software *IBM SPSS Statistics Package version 21*. The statistical significance level was set at  $\alpha = .05$  (two tailed). All demographics

information and general information related to housework participation at home was analysed with descriptive statistics. For Hypothesis 1, Spearman's  $r$  was used to determine the correlation coefficient of SMR-HW and PSOCQ. For Hypothesis 2, the goodness of fit chi-square test was used to determine if the null hypothesis 'women who agree and disagree on each of the two barrier statements related to habits and routines of housework are of equal proportions' could be rejected. For Hypothesis 3, single measure intra-class correlation determined the diversity of women's ratings of the 14 barrier statements. For the interpretation of correlation coefficients,  $r$  value in the range of 0–0.2 was considered weak,  $r$  value in the range of 0.3–0.6 was considered strong and  $r$  value in the range of 0.7–0.9 was considered strong (Brace, Kemp, & Snelgar, 2009).

### **7.3.4 Results.**

#### ***7.3.4.1 The sample.***

Forty-six women with upper limb RSI, recruited from May 2012 to August 2013, agreed to participate in the study. The mean age of the women was 56 (SD 8.61, Range 40–82). Details of their demographic information are presented in Table 7.7.

Table 7.7

*Characteristics of Women with upper limb RSI (n=46)*

<b>Characteristics</b>		
Age, mean ( $\pm$ SD)/Range		56 ( $\pm$ 8.61)/40-82
Marital Status, n (%)	<i>Married</i>	32 (70%)
	<i>Single/Divorced/Widowed</i>	14 (30%)
Hours of Housework per week, n (%)	<i>Less than 20Hrs in Housework</i>	33 (72%)
	<i>More than 20Hrs in Housework</i>	13 (18%)
Maid, n (%)	<i>Yes</i>	5 (11%)
	<i>No</i>	41 (89%)
Paid Work, n (%)	<i>Yes</i>	20 (44%)
	<i>No</i>	26 (57%)
Family, n (%)	<i>Live with adult children</i>	8 (17.4%)
	<i>Live with children under 18 years old</i>	5 (11%)
	<i>Family helps in housework</i>	25 (54%)
	<i>Family does not help in housework</i>	21 (46%)

#### **7.3.4.2 Hypothesis 1: validity of SMR-HW staging algorithm.**

There was a significant positive moderate correlation between SMR-HW and PSOCQ ( $r = 0.387$ ,  $p = .008$ ). This shows that the concurrent validity of SMR-HW falls within the expected range, indicating that women with upper limb RSI go through stages of change during ergonomic education.

#### **7.3.4.3 Hypothesis 2: perception of barriers related to housework habits and routines.**

Among 46 women with upper limb RSI in this study, more than 50 per cent (72%) agreed with the statement 'I cannot do my housework as quick as before'. Also,

more than 50 per cent (74%) agreed with the statement 'I cannot do my housework as well as I did before'.

Chi-square analysis revealed that more than 50 per cent of women perceived that a disruption of their housework standard in terms of speed,  $\chi^2(3, N=46) = 24.78$ ,  $p=.000$  and quality  $\chi^2(3, N=46) = 34.35$ ,  $p=.000$  are barriers to them making a change.

#### ***7.3.4.4 Hypothesis 3: Individual variation in the perception of barriers.***

The single measure intra-class correlation coefficient on women's rating of the 14 barrier statements was weak ( $r = 0.116$ , CI .064 - .199,  $p=.000$ ). This indicates the diversity of the women's ranking of the 14 barrier statements related to making changes in housework.

#### **7.3.5 Discussion.**

This pilot study provides preliminary evidence on the validity of the SMR-HW, a component of the BeCHA; it also generates findings consistent with the model of behaviour change in housework for women with upper limb RSI. A significant positive moderate correlation was found between SMR-HW and PSOCQ. The results provide preliminary evidence to indicate that women go through different stages of change during ergonomic education on housework.

This study also provided an opportunity to explore any inconsistencies in the participants' responses on the SMR-HW and the PSOCQ. It was found that three women who responded 'no' to the question 'Has a health professional talked to you about changing the ways to do your housework?' were classified into a much advanced level of motivational readiness, according to the PSOCQ. In the SMR-HW, when a woman gives a 'no' response to this question, she will immediately be given a scale 2 'unaware of the link between the condition and housework' as her level of motivational readiness. For these three women, although they might not have heard about changing

housework to manage their condition from a health professional, it appeared they were still aware of the link between their condition and housework. Thus, the question will be adapted to 'Are you aware that a change in your housework can make a difference in your condition?' for future testing.

The findings of the present pilot study show that the majority of women who participated in the study perceived that changes which affect the standard and speed of their housework as a main barrier. This finding reflects the women's attachment to a set of housework routines that need to be efficient and of a high standard. This finding not only provides evidence that is consistent with the model, but was also consistent with the findings of a study by Poortman and Van Der Lippe (2009). In their study, they compared gendered attitudes towards housework and found that women (in general) have a more positive attitude towards housework and set higher standards for it.

The present study also confirms there is a great deal of individual diversity in how women perceive barriers related to making changes in housework. In this small sample, this pattern of diversity was higher than hypothesised. This supports the complexity associated with change, and confirms the importance of therapists 'listening and communicating' to their clients. 'Listening and communicating' is a major component in client-centred practice, identified in a review (Sumsion & Law, 2006), which is also the central philosophy of occupational therapy.

### **7.3.6 Limitations and recommendations for future development of the BeCHA.**

As this is a pilot study, the small sample size compromises the power of the study. With the correlation estimated from the concurrent validity test of SMR-HW, and with the use of an improved version of the two questionnaires, a bigger sample size is suggested for the next study. A sample of at least 85 participants will be required for a

power of 80 per cent to show a two-sided significance of  $p < 0.05$ , for a moderate correlation of at least 0.3 (Machin, Campbell, Tan, & Tan, 2009). As such, it is recommended that a bigger study, with a sample size of 85, be conducted in the next phase. Further study would be useful to validate the reasoning process of OTs within an acute clinical setting. Also, as the current study focus only on the development and validity of the BeCHA in English version only, further study needs to be carried out to develop a Chinese version of the tool.

### **7.3.7 Conclusion and implications for practice.**

This study provides preliminary evidence on the validity of the SMR-HW and generates findings consistent with the model of behaviour change in housework for women with upper limb RSI. As such, it also provides preliminary support for its clinical use. Although all women in the study share the same identify as a homemaker, the results indicate that women perceive barriers differently. As such, it is important for a therapist to understand the meanings that each woman attaches to housework. This confirms the importance of OTs' 'listening and communicating' with women with upper limb RSI, when they conduct ergonomic education on housework for them.

## **7.4 Chapter Summary**

In this chapter, I have described the need and the procedures for the development of a self-reported assessment tool on housework to address a gap in the therapists' clinical reasoning process. The tool provides a systematic way for therapists to collect information related to housework, hence facilitating their ability to 'listen and communicate' with clients. The design of the assessment tool was based on the constructs of the model of behaviour change in housework presented in the previous chapter, and the findings of the two GT studies described in Chapters Four and Five. I have also reported the findings of a pilot study, which provides evidence to support the



use of a model of behaviour change in housework for women in upper limb RSI. In the next chapter, I will summarise and conclude the findings of all three studies in this thesis.

## **Chapter 8: Recommendations and Conclusion**

### **8.1 Introduction**

The central theme of this thesis is to understand how to facilitate women with upper limb RSI to make changes in housework, by listening to both the women's voices and the therapists. This has led to the construction of a model of behaviour change in housework for women with upper limb RSI. In this chapter, a summary of the model and its findings will be presented. Possible challenges to translate this knowledge to action in occupational therapy practice within an acute health care setting will also be discussed, before making specific recommendations for practice. The chapter will then conclude with recommendations for future research.

### **8.2 A Model of Behaviour Change for Women with Upper Limb RSI**

A model of behaviour change was constructed, based on two GT studies, which explored the perspectives of both women with upper limb RSI and the OTs who educate them on ergonomic practices in housework. Based on the GT study of women with upper limb RSI (Study I), the model indicates that although each woman attaches a different set of meanings to housework, most of these meanings are positive. This leads to their positive attitude towards housework, and hence their common emotional attachment to it. They want to do housework personally and expect it to be done quickly and to an acceptable standard. These women cognitively understand that a change to housework practices and routines is possible and necessary, based on the health professional's advice and their experiences of pain (both personal and their knowledge of other people's experience). Despite this, they may still be unwilling to make changes because of the meanings they attach to housework and because they would find such changes emotionally unacceptable. As such, it is important for therapists to understand this basis of the women's decision making when they conduct ergonomic education.

Based on the GT study with OTs (Study II), the model indicates these women go through various levels of willingness and motivational readiness before they finally persevere with a change. Therefore, it is important for therapists to discern the motivational readiness of a woman with upper limb RSI to plan intervention strategies that are stage appropriate. The essence of the model lies in its emphasis on the individuality of women with upper limb RSI, and the importance of client-therapist interaction during ergonomic education on housework for them.

Based on a comparison of the findings from these two GT studies, gaps in therapists' clinical reasoning process within the context of an acute hand therapy clinic were identified. First, therapists lack a deeper understanding of the meanings women with upper limb RSI attach to housework. Second, constrained by the limited time and space within a busy clinical environment, therapists are unable to gather sufficient information on the occupational stories of women with upper limb RSI through narrative reasoning, compromising the implementation of a genuine client-centred practice by properly listening and communicating with their clients. As such, it was also observed that the approach used by most therapists is more didactic than client-centred.

Based on the model constructed from the two GT studies and the findings of these studies, an assessment tool BeCHA, which includes a scale SMR-HW and questionnaire on 14 barrier statements, was designed. The intent is to provide a tool that will facilitate therapists' clinical reasoning process for an occupation based and client-centred practice for this group of women. A pilot study was then conducted to explore the tool's validity in enabling systematic collection of information related to these women's decision making in housework. As the pilot study provides preliminary evidence to support the use of the model, and the tool's validity and usefulness, further work on the assessment tool is needed with a larger sample size. In essence, the model

indicates the individual differences among these women, and the findings of these studies address some important issues related to the application of client-centred practice in occupational therapy.

### **8.3 A Client-Centred Practice**

According to the occupational therapy Code of Ethics published in 2005, the emphasis of client-centred practice is clearly reflected in Principle 3 (American Occupational Therapy Association, 2005). This states that occupational therapy personnel should collaborate with their clients to set goals and priorities throughout the intervention process (American Occupational Therapy Association, 2005). The concept of client-centred practice was first introduced by Rogers (1939) and defined by Law, Baptiste and Mills (1995, p. 253) within the context of occupational therapy as:

An approach to providing occupational therapy, which embraces a philosophy of respect for and partnership with people receiving services. It recognizes the autonomy of individuals, the need for client choice in making decisions about occupational needs, the strengths clients bring to an occupational therapy encounter and the benefits of client-therapist partnership and the need to ensure that services are accessible and fit the context a client lives.

Findings of the studies in the present research consistently indicate the importance of client-centred practice for women with upper limb RSI, by confirming the need for individualised education, one of the seven concepts common to all occupational therapy models with a client-centred approach (Rosa, 2009). While Study I indicates the need for therapists to understand the different meanings of housework for each woman during ergonomic education, Study II indicates the therapists' awareness of the importance in providing relevant advice, adapted for each individual client.

## **8.4 Challenges to Client-Centred Practice**

Although the present research indicates the importance of client-centred practice for women with upper limb RSI, implementing this is not an easy task. The present research identified three main challenges.

### **8.4.1 Expectations of therapists and women with upper limb RSI.**

In an ideal client-centred practice, both therapist and client share equal power in the relationship, instead of an expert-patient relationship (Sumsion & Law, 2006). The findings of the present research demonstrate an imbalance of power between the therapists and women with upper limb RSI. This clearly creates barriers to change and successful implementation of a client-centred approach. Although therapists are aware of the need to orientate their education towards a client-centred approach, by listening and communicating with their clients, therapists largely see themselves as experts, and use a didactic approach to giving advice. An ethnographic study in the US was conducted with four OTs involved in the Environmental Skill Building Program designed to help caregivers to manage people with dementia at home (Toth-Cohen, 2008). The study found that, although therapists intended to provide client-centred, collaborative intervention, they found the role of 'expert' more familiar (Toth-Cohen, 2008). This issue could be further complicated by women's similar expectations of the therapists as an 'expert' in the relationship. Findings from Study II show that therapists perceive doubts from women with upper limb RSI regarding their ability as experts to provide advice on housework. The women's doubts about the therapists possibly reflects their disappointment when they perceive that therapists may not be experts in housework, according to their expectations. In other words, to a certain extent, both therapists and women with upper limb RSI could expect an expert-patient relationship in the education process, which then becomes a barrier to a genuine client-centred

practice. Although making changes to such deep rooted expectations cultivated by biomedical environment is not easy, the present research has certainly initiated this journey.

#### **8.4.2 Therapists' personal experience and clinical experience.**

Personal factors, such as a clinician's values and beliefs, influence their behaviour towards clients (Duggan, 2005; Kinsella, 2001a). While therapists' lack of personal experience in housework leads to a lack of deeper understanding of the meanings women with upper limb RSI attach to housework, this also affects the way they interact with their clients.

According to the professional reasoning continuum described by Schell (2009), most therapists may not have sufficient years of clinical experience in reflective practice that enables them to conduct client-centred practice competently. Reflective practice refers to the critical way that a therapist reflects upon his or her therapy actions, both during and after therapy, for the purpose of learning (Kinsella, 2001). Ten out of 14 therapists in Study II had less than five years of clinical experience, and 13 out of 14 therapists had less than five years of experience in conducting ergonomic education. This could be one reason why components of client-centred practice were not present in a major way from the clinical reasoning process of the therapists in Study II. In a survey with 97 OTs from different practice contexts, to investigate barriers to client-centred practice, 'The therapist does not know enough about client-centred practice' was ranked as the top barrier (Wressle & Samuelsson, 2004). For therapists with limited personal experience related to housework and limited clinical experience in client-centred practice, they might find applying this practice during intervention a challenge. However, these problems can be resolved. Certain therapists in the study have already mentioned they tried to learn from their clients, respecting their expertise in housework

(one of the key elements in client-centred practice). More recommendations on how to address this challenge can be found in later sections.

#### **8.4.3 Biomedical environment in an acute setting.**

Within the biomedical culture of acute health care settings, with an emphasis on effective treatments within the shortest possible time frame, OTs could face challenges to follow through with a client-centred practice, due to paradigmatic conflict. The challenge faced by OTs in a biomedical environment, to maintain alignment with the central philosophy of their practice due to a paradigmatic conflict, was observed in studies both Australian (Wilding & Whiteford, 2007) and Canadian contexts (Duggan, 2005). In the present research, the domineering culture of a biomedical environment could be the main factor steering the therapists' focus towards efficiency and prescribing quick advice, instead of making sense of their clients' behaviours and gaining a deeper understanding of the meanings they attach to housework.

Apart from a paradigmatic conflict in clinical culture, time pressures within such an environment also form another barrier for the therapist to listen and communicate. According to a qualitative study conducted with therapists within three practice contexts (children's rehabilitation centres, community based service and older adult service), limitations in time and resources was a major barrier to client-centred practice (Wilkins, Pollock, Rochon & Law, 2001). Also, according to a review of 38 studies in various practice contexts, time pressure was the most cited barrier for therapists to implement shared decision making with their clients (Légaré, Ratté, Gravel & Graham, 2008). In a biomedical environment such as the present research, this time pressure will be even more significant. Despite the challenge of time pressure, it is evident from the study that therapists are fully aware of the need to listen and communicate with their clients. Some even suggested using a booklet for clients to fill in, facilitating a better

understanding of their clients in the education process. More specific recommendations will be discussed in later sections.

### **8.5 Limitations of the Research**

The findings of the study must be considered with its limitations. The two grounded theory studies in this thesis was based on the experiences and perception of the clients and therapists in one specific clinical setting in Singapore and the findings do not represent clients and therapists from other socio-cultural environment and clinical settings. As such, the application of this framework to women with upper limb RSI in other settings need to be further confirmed and adjusted as necessary for application.

In the last study of this thesis, a tool was developed to assess women's readiness to make changes in housework. One of the limitations of this study is the small sample size. As such, further studies with a bigger sample size is warranted. Also, the study has not involved the feedback of clients in the use of the tool, further study in this aspect is also needed for the tool to be further refined.

### **8.6 Implications for Practice—Translating Knowledge to Action**

According to Metzler and Metz (2010), to translate knowledge to action involves seven phases. One of these is promoting the use of knowledge through selecting, tailoring and implementing interventions in practice. Considering the findings of the present research indicating the need for, and barriers to, a client-centred approach, three recommendations for occupational therapy practice are suggested. The main aim here is to improve client-therapist interaction during ergonomic education and to initiate change to gain support from the organisation for interventions that should encourage a client-centred approach.



### **8.6.1 Client-therapist interaction.**

The present research reported important differences in terms of personal experiences related to housework between OTs in Study II and women with upper limb RSI in Study I. OTs need to be aware of these differences, which influence their interaction with the women, and to ensure they do not become barriers to a client-centred practice. They also need to understand the personal factors related to women with upper limb RSI and their housework, and identify effective strategies to address these factors through their interactions. According to a study with 97 OTs within three practice contexts, it was found that although most therapists understand the principles of client-centred practice, most still need support in the form of training to translate these principles into actions (Wressle & Samuelsson, 2004). In the study, it was found that out of 18 methods to resolve barriers to client-centred practice, the first nine methods all relate to therapists' training (Wressle & Samuelsson, 2004).

#### ***8.6.1.1 Training of therapists.***

Therapeutic use of self is defined as therapists' conscious use of both verbal and non-verbal actions to optimise their interactions with clients (Cole & McLean, 2003). Although the present research found a generational gap in age between the therapists and clients led to issues in client-therapist interaction, this can be addressed through training therapists. According to a national survey of practising OTs in the US by Taylor, Lee, Kielhofner, and Ketkar (2009), it was found that despite differences in gender, age, experience level, clinical setting and clinical groups, practitioners who had more training in therapeutic use of self were also more likely to show concern and positive regard for clients.

Four main areas were identified as important in training. First, therapists need to fully understand and accept their position as an expert in the technical knowledge

related to the condition and their clients' position as an expert in their knowledge of housework. Second, therapists need to facilitate their clients' understanding of this relationship. Third, they need to be aware that the way they interact with clients could facilitate or become a barrier to client-centred practice. They should receive training in the therapeutic use of self during client-therapist interaction. Fourth, they need to be trained in strategies to overcome barriers to client-centred practice, in terms of constraints in time and resources within their clinical context.

Training could be provided in the form of reflective group discussion sessions. Reflective practice is an important component within a framework of strategies for client-centred practice, as proposed by Restall, Ripat, and Stern (2003). In a study by Duggan (2005) with four OTs, the participants also perceived reflective group discussion as a launch pad to move towards client-centred practice. These sessions can focus on discussions about the major components of client-centred practice identified by Sumsion and Law (2006), and effective strategies identified in other literature (Légaré, Ratté, Gravel, & Graham, 2008; Restall et al., 2003; Sumsion, 2005; Wressle & Samuelsson, 2004).

#### ***8.6.1.2 The use of the assessment tool BeCHA.***

The present research suggested the use of an assessment tool BeCHA as one way to facilitate client-therapist interaction within a busy clinical environment. The use of assessment processes to help therapists focus on important issues relevant to clients were also suggested by Restall et al. (2003), in a proposed framework of strategies for client-centred practice. Examples of such tool includes the goal attainment scales first developed by Kiresuk and Sherman (1968), and the Canadian occupational performance measure developed by Law et al. (1990). It is recommended that therapists should start

using the BeCHA and evaluate if it makes a difference in their interaction with their clients.

### **8.6.2 Programme evaluation.**

For any intervention to be implemented successfully, organisational support is important. According to the findings of three studies by Wilkins et al. (2001), with 32 practitioners (OTs and rehabilitation service providers and managers) in three different clinical contexts, it was found that study participants perceived support from all levels of an organisation as an essential component for successful implementation of a client-centred practice. To gain an organisation's support for any form of intervention within the current healthcare climate, evidence of the intervention's effectiveness is needed.

Evidence based practice was first mentioned in medicine, among health care professions (Guyatt, Cairns, Churchill, & et al., 1992). According to Sackett, Rosenberg, Gray, Haynes, and Richardson (1996), 'The practice of evidence based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research'. In occupational therapy, evidence based practice has also become a requirement. The occupational therapy Code of Ethics, states that 'Occupational Therapy Personnel shall critically examine available evidence so they may perform their duties on the basis of current information' (American Occupational Therapy Association, 2005).

As no evidence from previous research could be found related to ergonomic education on housework for women with upper limb RSI, it is recommended that a programme evaluation planned according to the present model, with a client-centred focus, should be carried out. Evidence from such programme evaluation would not only provide a channel for improving intervention, but it would also help gain support from the organisation. Moreover, once therapists are engaged in programme evaluation, they

are also more likely to make a conscious effort to align their actions according to the model and a client-centred practice.

## **8.7 Recommendations for Future Research**

Through two GT studies, the present research has identified important differences in perceptions between the therapists and women with upper limb RSI, which lead to the identification of an important gap in therapists' clinical reasoning process. Although the present research indicates how future research can be conducted with a client-centred orientation, further research is needed on the present model.

### **8.7.1 A model of behaviour change in housework.**

The meanings that women attach to housework can vary with social and cultural environments (Klocokova, 2004). However, the present research found the main issue in interactions between therapists and women with upper limb RSI was mainly due to a generational difference in their social roles as women. As such, it is recommended that future research based on a constructivist grounded theory approach be conducted to investigate the perception of housework among women of different social and cultural roles within the country.

For an intervention to be successful, effective intervention strategies are important. It is recommended that further research be conducted to identify the decision factors important for women's transition through various stages of change. Quantitative studies of at least 80% power with larger sample sizes across other cultural groups should also be carried out to establish the association of these decision factors with the various stages of change and to further validate the assessment tool developed based on the present model. Considering the time pressures and limited resources in an acute clinical setting, it is also important to conduct further research to identify and test

effective intervention strategies that are appropriate within the limitation of an acute clinical setting.

### **8.7.2 Qualitative research in occupational therapy intervention.**

The present research demonstrates the process of translating findings regarding the clinical reasoning process of therapists, and perceptions of women with upper limb RSI, to a client-centred intervention. A match in perceptions between therapists and clients is crucial to a successful intervention that generates positive treatment outcomes (Zane et al., 2005). As such, it is recommended that research adopting similar processes should be conducted to explore both the clinical reasoning process of therapists and the perceptions of their clients in other clinical areas within occupational therapy practice lacking such evidence to facilitate this match. As client-centred practice should include clients' voices at all intervention stages, qualitative research that guides the planning of occupational therapy intervention should follow the same principle (Hammell, 2001).

## **8.8 Conclusion**

Framed by a client-centred approach, a central philosophy of occupational therapy, I conducted two GT studies. I have identified essential components to construct a model of behaviour change in housework for women with upper limb RSI. The findings of these two studies have not only helped identify certain gaps in therapists' clinical reasoning process that fall short of the essence of a client-centred practice, they also indicate its importance. Although barriers to such practice in occupational therapy within an acute care setting are particularly challenging, I have made attempt to address them.

Based on the model, an assessment tool was designed as an initial step to address some major barriers to client-centred practice within an acute care setting. A pilot study was also conducted, which provided preliminary evidence for using the

model, confirming the preliminary validity of the assessment tool. The present research is important not only because it provides a framework for understanding the needs of, and how to improve intervention for, this particular group of women, but also because it sets an example of how research with a client-centred approach could be conducted in other clinical areas within occupational therapy practice.

‘The best theory is informed by practice; the best practice should be grounded in theory’ (Glanz et al., 2008, p. 24). This thesis has succeeded in beginning a journey to achieve best practice in ergonomic education on housework for women with upper limb RSI within a hand therapy outpatient clinic. It is grounded in a model developed from the voices of both women with upper limb RSI and their OTs.

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## Appendices

### Appendix 1 Primary Intervention Level - Mechanical Exposure Intervention on Internal Exposure

Authors and year	Study aim	Sample	Results
Kotani et al. (2007)	To compare four workstation configurations. I, II, III and IV	N=20 (M=10, F=10)	Statistical significant decrease wrist ulna deviation by 50%, as keyboard position moved away from user but wrist extension increased. However, wrist extension maintains the same for all configurations with a pad.  Workstation four with keyboard 12cm from edge and with a pad results in decreased muscle activity in wrist extensors by 4%.
Delisle et al. (2006)	To compare three workstation configuration, A, B and C	N=20 (M=3, F=15)	No significant difference in muscle activity of upper limbs (deltoid and trapezius) measured by EMG between work stations. Greater variability in muscle activity in deltoid and tranpezius with workstation A.
Dumas et al. (2008)	To compare two work station configurations. With standard desk, with desk attachment board	N=19 (F=19)	Increased muscle activity in the right trapezius and forearm extensor digitorum.
Zecevic et al. (2000)	To compare three workstations. Two alternative keyboard designs and one standard keyboard design.	N=16 (M= 2, F= 14)	Hand positions measured with two VHS camcorders and DEA SWIFT Coordinate Measuring Machine were significantly more neutral in terms of forearm and wrist angles in alternate design keyboards compared to standard keyboards.
van Galen et al. (2007)	To compare two workstations. Standard keyboard design with a new keyboard design.	N=9 (M=6,F=3)	Lower muscle activity in finger extensors measured by EMG was observed in workstation with the new keyboard design.

## Appendix 2 Primary Intervention Level—Modifier Intervention (Ergonomic Education/Training) on Internal Exposure

Authors and year	Study aim	Sample	Results
Marcoux et al. (2000)	To investigate the effectiveness of a 12-week education programme to prevent CTD.	N= 40 (M=9, F=31)	Follow up at 1 year post intervention. Significant changes in self-reported hand/wrist (p=.016) and neck/shoulder (p=.003) posture after intervention.
Mirmohammadi et al. (2012)	To investigate the effects of a four-hour ergonomic training program on working postures of VDT users.	N=70(M=9, F=61)	Follow up at 1 month post intervention. Significant improvement in postures of the upper limb (shoulder, elbow and wrist) as measured by rapid upper limb method (RULA) with p<.001.
Taieb-Maimon et al. (2012)	To compare three groups: group 1 with no intervention; group 2 with office training; group 3 with training and self-modelling photo training.	N=60 (M=22, F= 38)	Baseline at week 1, intervention at week 2–4, post intervention follow up at week 6. Both intervention groups resulted in significant improvement in short term posture (p<.05).
Houwink et al. (2009)	To determine if an alternative mouse design is effective in promoting better postures, lower muscle activity in upper limbs and if these effects are enhanced by training.	N=30 (M=15, F=15)	Alternative mouse design resulted in a significantly more neutral forearm posture (p<.05). More significant improvements were observed in the trained group than untrained group (p<.05). Wrist extensor muscle activity was only reduced with alternative mouse design when training was provided (p<.05).

**Appendix 3 Primary Intervention Level—Multi-component Intervention on Musculoskeletal Health (MH) and/Internal Exposure (IE). No Comparison Group**

<b>Authors and year</b>	<b>Study aim</b>	<b>Sample</b>	<b>Results</b>
Goodman et al. (2005)	To evaluate effectiveness of a computer ergonomics intervention for an engineering company. (Mechanical exposure intervention with ergonomics education/training).	N=16	MH: 81.5% of complaints reported by workers pre-intervention were resolved post intervention at 1 year follow up.
Dainoff et al. (2005)	To evaluate the effect of an ergonomic intervention on musculoskeletal, psychosocial and visual strain of VDT data entry work—US part. (Mechanical exposure intervention with ergonomics education/training).	N=26	MH: Statistically significant reduction in intensity and frequency of musculoskeletal pain, after intervention at 1 month, as well as at 1 year follow up IE: postural angles of trunk and head as well as static load significantly improved after intervention at 1 month as well as 1 year follow-up. Trapezius load was significantly decreased after intervention after intervention but increased at one year follow up due to calibration problem). All $p < .001$ .
Aaras et al. (2005)	Same as above—Norwegian part. (Mechanical exposure intervention with ergonomics education/training).	N=30	MH: Statistical significant reduction in shoulder pain. IE: statistical significant reduction in trapezius load in the female data dialogue population at 1.5 years post intervention and 2.5 years follow-up. ( $p < .01$ .) Relationship between IE and MH: Association between reduction in trapezius load and reduction in shoulder pain.
Konarska et al. (2005)	Same as above—Polish part. (Mechanical exposure intervention with ergonomics education/training).	N=16	MH: Statistical significant improvement in subjective evaluation of chair comfort at 1 month and 1 year follow up. IE: significant improvement in sitting posture after intervention at 1 month and 1 year follow up. ( $p < .01$ ).

<b>Authors and year</b>	<b>Study aim</b>	<b>Sample</b>	<b>Results</b>
Lewis et al. (2001)	To evaluate the effectiveness of a VDT training programme designed to enable self-directed intervention in computer workers. (Mechanical exposure intervention with ergonomics education/training).	N=170	MH: Significant reduction in severity of symptoms in head and upper back (p=.04), shoulder (p=.02), hand/wrist (p=.003) IE: Significant increase in number of correct postures for head (p=.00004) and mouse positions (p=.0000001). Both were measured with self-reported surveys one year post intervention.
Street et al. (2003)	To evaluate effect of a participatory ergonomics education programme on computer users. (Mechanical exposure intervention with ergonomics education/training)	N=23	MH: No statistical improvement in quality of life measured by SF36 at 5 weeks final follow-up. IE: Statistical reduction in postural risk measured by Postural and Repetitive Risk Factors Index (PRRI) at 5 weeks final follow-up (p<.01)



**Appendix 4 Primary Intervention Level—Multi-component Intervention on Musculoskeletal Health (MH) and/Internal Exposure (IE)—With Comparison Group/s**

<b>Authors and year</b>	<b>Study aim</b>	<b>Sample</b>	<b>Results</b>
Mahmud et al. (2011)	To evaluate if ergonomic training reduces musculoskeletal disorders among office workers (Mechanical exposure intervention with ergonomics education/training)	N=43 Training group N=55 Control group with no intervention Randomisation method used	Intervention group vs. control group with no intervention. Follow up at 6 months. MH: Significant reduction in number of people with MSDs in both upper limbs ( $p<.05$ ) for intervention group. IE: Significant work habits change in keyboard, mouse, chair and desk use ( $p<.05$ ). No significant changes observed in control group
Choobineh et al. (2011)	To evaluate the impact of ergonomic intervention among office workers (Mechanical exposure intervention with ergonomics education/training)	N=73 Intervention group N=61 Control group with no intervention Randomisation method used	Intervention group vs. control group with no intervention. Follow up at 6 months. MH: No significant reduction in prevalence of MSDs in upper limbs but significant reduction for back, feet/ankles ( $p<.01$ ). IE: Significant reduction in physical isometric work load ( $<.01$ ). No significant changes in control group
Greene et al. (2005)	To evaluate the effects of an active ergonomics training programme in computer users (Mechanical exposure intervention with ergonomics education/training)	N=43 Group I with intervention N=44 Control group with no intervention Randomisation method used	Intervention vs. control group with no intervention. Follow up at 5 weeks and 1 year. MH: Significant reduction in pain symptoms of the upper limbs in intervention group compared to control group at 5 weeks. Benefits from intervention were maintained or further improved at 1 year follow-up IE: Significant improvement in risk exposure measured by RULA as compared to group at 5 weeks ( $p<.01$ ).
Robertson et al. (2008)	To evaluate effect of ergonomics training and work space design among office workers	N=121 Workstation group (WS) N=31 Workstation with	Two intervention groups vs. one control group. WS group provides a flexible workspace without training. WS +T group provides training and a flexible workspace. Follow up at 3 and

<b>Authors and year</b>	<b>Study aim</b>	<b>Sample</b>	<b>Results</b>
	(Mechanical exposure intervention with ergonomics education/training)	training group (WS+T) N=45 Control group with no intervention No randomisation used	6 months. MH: At 6 months, Significant difference in reduction of musculoskeletal symptoms in WS+T group compared to WS group. IE: At 6 months, significant improvement in body postures and behaviour in ergonomic practices for WS+T group.
Laestadius et al. (2009)	To evaluate the effectiveness of a proactive ergonomic program on office workers. (Mechanical exposure intervention with ergonomics education/training)	N=249 Group I with training and individualised workstation assessment (T.+WS) N=110 Group II training without individualised workstation (assessment (T) N=808 Control group with no intervention No randomisation used	Comparison of intervention groups and control group. Follow up at 1.5 years. MH: Significant reduction in musculoskeletal pain in shoulder, hand and wrist pain in T+WS group ( $p<.05$ ) and no significant reduction in musculoskeletal pain of these areas in T group. IE: Significant improvement in shoulder and elbow posture in T+WS group ( $p<.05$ ) and no significant improvement in these postures in T group. Relationship between IE and MH: Association between improvement in postures and less musculoskeletal pain

<b>Authors and year</b>	<b>Study aim</b>	<b>Sample</b>	<b>Results</b>
Rempel et al. (2006)	To evaluate the effects of a forearm support surface in computer workers (Mechanical exposure intervention with ergonomics education/training)	N=46 Control Group I ergonomic training only N=45 Group II ergonomic training +track ball N=46 Group III ergonomic training +arm board N=45 Group IV ergonomic training + arm board + trackball Randomisation method used	Comparison of intervention groups and control group. Follow-up at 1 year. No interaction effect between trackball and arm board. MH: Significant reduction in incidence of musculoskeletal disorders in neck shoulder with the use of arm board in group III ( $p < .05$ ). No significant reduction in incidence of these musculoskeletal disorders with the use of track ball in Group II. Significant reduction in pain intensity of neck/shoulder and right upper limbs ( $p < .05$ ) with the use of arm board. No significant reduction in pain intensity of these areas with the use of trackball. Significant reduction in pain in intervention groups as compared to control group with training only ( $p = .001$ )

## Appendix 5 Secondary/Tertiary Intervention Level - Mechanical Exposure Intervention on Musculoskeletal Health

Authors and year	Study aim	Sample	Results
Ripat et al. (2006)	To compare the effects of two ergonomic keyboards for computer workers with UEDs	<p>N= 41 Group with an adapted ergonomic keyboard</p> <p>N= 24 Group with an unadapted ergonomic keyboard</p> <p>Randomisation method used</p>	<p>Measurements at baseline with standard keyboard. Follow up with b keyboards week 0, week 12 and week 24 after intervention.</p> <p>Significant improvement in symptom severity and functional status before and after intervention for both groups at 12 weeks and maintained at 24 weeks (p&lt;.05)</p> <p>No significant difference in improvement in functional status and symptom severity between two groups at week 12 and week 24</p>
Ripat et al. (2010)	To compare the effects of two ergonomic keyboards for computer workers with UEDs – a follow up study	<p>N= 15 Group with an adapted ergonomic keyboard</p> <p>N=14 Group with an unadapted ergonomic keyboard</p> <p>Randomisation method used</p>	<p>Follow up at three years after intervention.</p> <p>Improvement in functional status and symptom severity for both groups maintained or further improved after three years.</p>

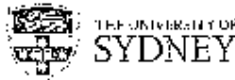
## Appendix 6 Secondary/Tertiary Intervention Level—Multi-component Intervention on Musculoskeletal Health

Authors and year	Study aim	Sample	Results
Bleecker et al. (2011)	To evaluate the effectiveness of a medical-ergonomic program on computer workers with UEDs (Mechanical exposure intervention with therapeutic modalities)	N=56. Patients stratified into two age groups N=20 Age group 23-35 N=36 Age group 36-61	Improvement in symptoms in 89% of participants. 19 out of 20 from Age group 23-35 showed improvement in symptoms 31 out of 36 from Age group 36-61 showed improvement in symptoms No statistical analysis to determine if there is significant difference between the two age groups
(Povlsen, 2012)	To evaluate a physical training program with ergonomic changes in keyboard operators with WRULDs (Mechanical exposure intervention with physical training)	N= 17 Workers with WRULDs with intervention N= 6 Workers who are pain free with no intervention	Significant improvement in pain (p=.009), typing endurance (p=.027) and speed (p=.032) for the intervention group. After intervention, all outcome measures in intervention group became similar to the control group (p=.058)
(Omer et al., 2003)	To evaluate the effectiveness of training and exercise programs on musculoskeletal disorders in computer users. (Mechanical exposure intervention with exercises)	N=25 Intervention group with an one hour of education program and exercises N=25 Control group with only an hour of education program Randomisation method used	Follow up at 2 months Significant reduction in pain and depression in the intervention group compared to control group (p<.05)

## Appendix 7 Combination of Intervention Levels—Multi-component Intervention on Musculoskeletal Health and/ Internal Exposure

Authors and year	Study aim	Sample	Results
Bernacki et al. (1999)	To evaluate the effectiveness of a coordinated program of medical care and ergonomics assessment and intervention on primary, secondary and tertiary prevention of UEWMsDs. (M+T) (Mechanical exposure with ergonomics education/training)	All employees in John Hopkins Hospital and University	Statistical significant decrease in rate of UEMSDs by 80% over a 7 year period. (p<.01)
Soares et al. (2012)	To compare the effects of four preventive interventions for UEDs among computer workers. (ME+T) (Mechanical exposure with ergonomics education/training)	N=22 Ergonomic intervention with biofeedback N= 23 Ergonomic intervention without biofeedback N=21 Control group without intervention Randomisation method used	Significant reduction of painful body parts (p=.001), severity of hand pain (p=.03)in both intervention groups compared to control group Significantly better postures in both intervention groups compared to control group (p=.000) No significant difference in outcomes between the two intervention groups

## Appendix 8 Ethics Approval for Study I



**RESEARCH INTEGRITY**  
**Human Research Ethics Committee**  
 Web: <http://sydney.edu.au/hrs/>  
 Email: [hr.ethics@sydney.edu.au](mailto:hr.ethics@sydney.edu.au)

Address for all correspondence:  
 Level 6, Jane Foss Russell Building - G02  
 The University of Sydney  
 NSW 2006 AUSTRALIA

Ref: IMWR

14 April 2010

Associate Professor Lindy Clemson  
 Discipline of Occupational Therapy  
 Faculty of Health Sciences  
 The University of Sydney  
 Email: [lindy.clemson@sydney.edu.au](mailto:lindy.clemson@sydney.edu.au)

Dear Professor Clemson

**Title:** Chinese housewives in Singapore with upper limb problems who live in Housing Development Board (HDB) Flats and their perceptions of the meaning of housework and difficulties/resistance/experience in the application of joint protection principles [Ref. No. 12774]

**PhD Student:** Ms Wai Chun Therna Cheung

Your application was reviewed by the Executive Committee of the Human Research Ethics Committee (HREC), and in doing so the Committee has ratified your study to include the PhD student - Ms Wai Chun Therna Cheung.

The Executive Committee acknowledges your right to proceed under the authority of [REDACTED]

Please note, this ratification has been given only in respect of the ethical content of the study. The Human Research Ethics Committee recommends that you consult with The University of Sydney **Audit and Risk Management Office** (Contact: Vlad Nesic, Telephone +61 2 9351 4127, Email [vlad.nesic@sydney.edu.au](mailto:vlad.nesic@sydney.edu.au)) to ensure that you are adequately covered for the purpose of conducting this research project.

It is mandatory that any modifications to the study are approved by *SingHealth Centralised Institutional Review Board* before forwarding a copy of the approved modification, approval letter and any new approved documents to The University of Sydney HREC.

Please do not hesitate to contact the Human Ethics Office should you require further information or clarification.

Yours sincerely

**Associate Professor Ian Maxwell**  
 Chair  
 Human Research Ethics Committee

cc Ms Wai Chun Therna Cheung [Email: [gwtche@seah.com.sg](mailto:gwtche@seah.com.sg)]

Deputy Manager Human Ethics  
 Ms Mariana Ceuninho  
 T: +61 2 8527 8176  
 E: [marianna.ceuninho@sydney.edu.au](mailto:marianna.ceuninho@sydney.edu.au)

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 Ms Patricia Engelmann T: +61 2 8627 8172 E: [patricia.engelmann@sydney.edu.au](mailto:patricia.engelmann@sydney.edu.au)  
 Ms Kala Retnam T: +61 2 8627 8175 E: [kala.retnam@sydney.edu.au](mailto:kala.retnam@sydney.edu.au)

ANU 13 211 613 484  
 CRUCS 100256

## **Appendix 9 Participant Information Sheet and Consent Form for Study I**

### **PARTICIPANT INFORMATION SHEET**

You are being invited to participate in a research study.

Before you take part in this research study, the study must be explained to you and you must be given the chance to ask questions. Please read carefully the information provided here. If you agree to participate, please sign the informed consent form. You will be given a copy of this document to take home with you.

#### **STUDY INFORMATION**

**Protocol Title:**

Chinese housewives in Singapore with upper limb problems who live in HDB Flats and their perceptions of the meaning of housework and difficulties/resistance/experience in the application of joint protection principles.

**Principal Investigator(s):**

Therma Cheung

Occupational Therapy Department

XXX Hospital

Outram Road Singapore 169608

Tel: xxxxxxxx

**Sponsor:**

*Not Applicable*



**PURPOSE OF THE RESEARCH STUDY**

You are being invited to participate in a research study of perceptions of housewives with upper limb problems in Singapore regarding their perception in housework and difficulties/resistance/experience in the application of joint protection principles. We hope to learn what housewives with upper limb problems feel will be useful to enable them to apply joint/tendon protection techniques to household chores. You were selected as a possible participant in this study because you meet the inclusion criteria of the study. This study will recruit participants from Occupational Therapy Department of XXX Hospital over a period of 2 years.

**STUDY PROCEDURES AND VISIT SCHEDULE**

If you agree to take part in this study, you will be asked to take part in an interview session with the principal investigator which will last about 1 hour. Your participation in the study will last about 6 months, as the investigator might need to contact you again after transcription of the data to validate the data collected during the initial interview.

**Schedule of visits and procedures:**

Visit 1:

Follow-up: The follow-up part consists of the principal investigator potentially contacting you to clarify data after transcription.

**YOUR RESPONSIBILITIES IN THIS STUDY**

If you agree to participate in this study, you should:

Keep your interview appointment. If it is necessary to reschedule the interview, please contact the study staff to reschedule as soon as possible.

Be prepared to be interviewed by the researcher at your home or to visit the hospital for the interview.

**WITHDRAWAL FROM STUDY**

You are free to withdraw your consent and discontinue your participation at any time without prejudice to you or effect on your medical care. If you decide to stop taking part in this study, you should tell the Principal Investigator as soon as possible.

Your doctor, the Principal Investigator may stop your participation in the study at any time for one or more of the following reasons:

Failure to follow the instructions of the Principal Investigator and/or study staff.

The Principal Investigator decides that continuing your participation could be harmful.

The study is cancelled.

Other administrative reasons.

Unanticipated circumstances.

**POTENTIAL BENEFITS**

If you participate in this study you may reasonably expect to benefit from the study by gaining an increased awareness of issues surrounding your participation in household chores. This may indirectly lead to active steps to address any issues.

**SUBJECT'S RIGHTS**

Your participation in this study is entirely voluntary. Your questions will be answered clearly and to your satisfaction.

In the event of any new information becoming available that may be relevant to your willingness to continue in this study, you or your legal representative will be informed in a timely manner by the Principal Investigator or his/her representative.

**CONFIDENTIALITY OF STUDY AND MEDICAL RECORDS**

Information collected for this study will be kept confidential. Your records, to the extent of the applicable laws and regulations, will not be made publicly available. Only your Investigator(s) will have access to the confidential information being collected.

However, Regulatory Agencies, Institution Review Board and Ministry of Health will be granted direct access to your original medical records to check study procedures and data, without making any of your information public. By signing the Informed Consent Form attached, you or your legal representative is authorizing such access to your study and medical records.

Data collected and entered into the Case Report Forms are the property of XXX Hospital.

In the event of any publication regarding this study, your identity will remain confidential.

**COSTS OF PARTICIPATION**

Upon completion of the study, you will be reimbursed for your time, inconvenience in the form of an S\$10 voucher.

**RESEARCH RELATED INJURY AND COMPENSATION**

The Hospital does not make any provisions to compensate study subjects for research related injury. However, compensation may be considered on a case-by-case basis for unexpected injuries due to non-negligent causes.

By signing this consent form, you will not waive any of your legal rights or release the parties involved in this study from liability for negligence.

**WHO TO CONTACT IF YOU HAVE QUESTIONS**

If you have questions about this research study and your rights or in the case of any injuries during the course of this study, you may contact the Principal Investigator Therma Cheung (Tel: xxxxxxxx or xxxxxxxx) or co-Investigator Yang Zixian (Tel. xxxxxxxx).

If you have questions about the study or your rights as a participant, you can call the XXX Centralized Institutional Review Board, which is the committee that reviewed and approved this study. (Tel: xxxxxxxx).

<b>CONSENT BY RESEARCH SUBJECT</b>	
<b>Details of Research Study</b>	
<b>Protocol Title:</b>	
<b>Chinese housewives in Singapore with upper limb problems who live in HDB Flats and their perceptions of the meaning of housework and difficulties/resistance/experience in the application of joint protection principles.</b>	
<b>Principal Investigator:</b>	
Therma Cheung	
Occupational Therapy Department	
XXX Hospital	
Outram Road Singapore 169608	
Tel: xxxxxxxx	
<b>Subject's Particulars</b>	
Name:	NRIC No.:
Address:	
Sex: Female/Male	Date of birth _____
	dd/mm/yyyy
Race: Chinese/ Malay/ Indian /Others (please specify) _____	

**Part I – to be filled by participant**

I, \_\_\_\_\_(NRIC/Passport

No. \_\_\_\_\_)

(Name of patient)

**agree / do not agree** to participate in the research study as described and on the terms set out in the Patient Information Sheet. The nature of my participation in the proposed research study has been explained to me in

\_\_\_\_\_ by Dr/Mr/Ms \_\_\_\_\_

(Language / Dialect) (Name of healthcare worker)

I have fully discussed and understood the purpose and procedures of this study. I have been given the Participant Information Sheet and the opportunity to ask questions about this study and have received satisfactory answers and information.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reasons and without my medical care being affected.

I also give permission for information in my medical records to be used for research. In any event of publication, I understand that this information will not bear my name or other identifiers and that due care will be taken to preserve the confidentiality of this information.

\_\_\_\_\_

[Signature/Thumbprint (Right / Left) of participant] (Date of signing)

## Appendix 10 Ethics Approval for Study II



**RESEARCH INTEGRITY**  
**Human Research Ethics Committee**  
 Web: [http://sydney.edu.au/research\\_support/ethics/human/](http://sydney.edu.au/research_support/ethics/human/)  
 Email: [ro.humanethics@sydney.edu.au](mailto:ro.humanethics@sydney.edu.au)

**Address for all correspondence:**  
 Level 6, Jane Foss Russell Building - G02  
 The University of Sydney  
 NSW 2006 AUSTRALIA

IM/KR

2 March 2011

Associate Professor Lindy Clemson  
 Discipline of Occupational Therapy  
 Faculty of Health Sciences  
 The University of Sydney  
 Email: [lindy.clemson@sydney.edu.au](mailto:lindy.clemson@sydney.edu.au)

Dear Professor Clemson

**Title: Experiences in conducting patient education program for Chinese housewives with Upper Limb Repetitive Strain Injuries (ULRSI) as perceived by Occupational Therapists (OT) (Database. No. 13612)**

**PhD Student: Ms Cheung Wai Chun Therma**

The Executive Committee of the Human Research Ethics Committee (HREC) has reviewed your study to include the PhD student – Ms Cheung Wai Chun Therma, and acknowledges your right to proceed under the authority of SingHealth Centralised Institutional Review Board

Any modifications to the study must be approved by SingHealth Centralised Institutional Review Board. A copy of the approved modification, approval letter and any new approved documents must be provided to The University of Sydney HREC for our records.

Please do not hesitate to contact Research Integrity (Human Ethics) should you require further information or clarification.

Yours sincerely

**Associate Professor Ian Maxwell**  
**Chair**  
**Human Research Ethics Committee**

cc Ms Cheung Wai Chun Therma [Email: [gouthc@sgl.com.sg](mailto:gouthc@sgl.com.sg)]

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 T: +61 2 8627 8176  
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 Ms Patricia Engelman T: +61 2 8627 8172 E: [patricia.engelmann@sydney.edu.au](mailto:patricia.engelmann@sydney.edu.au)  
 Ms Kala Retnam T: +61 2 8627 8173 E: [kala.retnam@sydney.edu.au](mailto:kala.retnam@sydney.edu.au)

ABN 15 211 513 464  
 CRICOS 00026A

## **Appendix 11 Participant Information Sheet and Consent Form for Study II**

### **PARTICIPANT INFORMATION SHEET**

You are being invited to participate in a research study.

Before you take part in this research study, the study must be explained to you and you must be given the chance to ask questions. Please read carefully the information provided here. If you agree to participate, please sign the informed consent form. You will be given a copy of this document to take home with you.

#### **STUDY INFORMATION**

**Protocol Title:**

Experiences in conducting patient education program for Chinese housewives with Upper Limb Repetitive Strain Injuries (ULRSI) as perceived by Occupational Therapists (OT)

**Principal Investigator(s):**

**Therma Cheung**

Occupational Therapy Department

XXX Hospital

Outram Road Singapore 169608

Tel: xxxxxxxx

**Sponsor:**

*Not applicable*



**PURPOSE OF THE RESEARCH STUDY**

You are being invited to participate in a research study of *perceptions of OT in the experience in conducting patient education for housewives with ULRSI*. We hope to learn how you perceive the current patient education program. You were selected as a possible subject in this study because *of your experience in the conduction of this type of patient education program*.

This study will recruit OT from Occupational Therapy Department, XXX Hospital over a period of *1 year*. About 6-10 therapists will be involved in this study

**STUDY PROCEDURES AND VISIT SCHEDULE**

If you agree to take part in this study, you will be asked to take part in an interview session with the principal investigator which will last about 1 hour. Your participation in the study will last about 1 year, as the investigator might need to contact you again after transcription of the data to validate the data collected during the initial interview.

**Schedule of visits and procedures:**

Visit 1:

Visit 2:

Follow up: The follow up part consists of the principal investigator potentially contacting you to clarify data after transcription.

**YOUR RESPONSIBILITIES IN THIS STUDY**

If you agree to participate in this study, you should:

Keep your interview appointment. If it is necessary to reschedule the interview, please contact the principal investigator as soon as possible.

Be prepared to be interviewed by the researcher in one of the therapy rooms in Occupational Therapy, XXX Hospital after office hours.

### **WITHDRAWAL FROM STUDY**

You are free to withdraw your consent and discontinue your participation at any time without prejudice to you. If you decide to stop taking part in this study, you should tell the Principal Investigator as soon as possible.

The Principal Investigator may stop your participation in the study at any time for one or more of the following reasons:

Failure to follow the instructions of the Principal Investigator.

The Principal Investigator decides that continuing your participation could be harmful. .

The study is cancelled.

Other administrative reasons.

Unanticipated circumstances.

### **POTENTIAL BENEFITS**

If you participate in this study you may reasonably expect to benefit from the study by gaining an increased awareness of issues surrounding the conduction of patient education for housewives with ULRSI. This may indirectly lead to active steps to address these issues and in turn improve your service to the patients.

### **SUBJECT'S RIGHTS**

Your participation in this study is entirely voluntary. Your questions will be answered clearly and to your satisfaction.

In the event of any new information becoming available that may be relevant to your

willingness to continue in this study, you or your legal representative will be informed in a timely manner by the Principal Investigator.

By signing and participating in the study, you do not waive any of your legal rights to revoke your consent and withdraw from the study at any time.

### **CONFIDENTIALITY OF STUDY AND MEDICAL RECORDS**

Information collected for this study will be kept confidential. Your records, to the extent of the applicable laws and regulations, will not be made publicly available. Only your Investigator(s) will have access to the confidential information being collected.

Data collected are the property of *XXX Hospital*. In the event of any publication regarding this study, your identity will remain confidential.

### **RESEARCH RELATED INJURY AND COMPENSATION**

The Hospital does not make any provisions to compensate study subjects for research related injury. However, compensation may be considered on a case-by-case basis for unexpected injuries due to non-negligent causes.

By signing this consent form, you will not waive any of your legal rights or release the parties involved in this study from liability for negligence.

### **WHO TO CONTACT IF YOU HAVE QUESTIONS**

If you have questions about this research study and your rights or in the case of any injuries during the course of this study, you may contact the Principal Investigator *Therma Cheung* at 63214129.

If you have questions about the study or your rights as a participant, you can call the XXX Centralised Institutional Review Board, which is the committee that reviewed and approved this study, the telephone number is xxxxxxxx during office hours (8:30 am to 5:30pm).

<b>CONSENT BY RESEARCH SUBJECT</b>	
<b>Details of Research Study</b>	
<b>Protocol Title:</b>	
Experiences in conducting patient education program for Chinese housewives with Upper Limb Repetitive Strain Injuries (ULRSI) as perceived by Occupational Therapists (OT)	
<b>Principal Investigator:</b>	
<i>Therma Cheung, OT department, SGH. 63214129</i>	
<b>Subject's Particulars</b>	
Name:	NRIC No.:
Address:	
Sex: Female/Male	Date of birth _____ dd/mm/yyyy
Race: Chinese/ Malay/ Indian /Others (please specify) _____	

**To be filled by participant**

I, \_\_\_\_\_(NRIC/Passport  
No. \_\_\_\_\_)

(Name of patient)

**agree / do not agree** to participate in the research study as described and on the terms set out in the Patient Information Sheet. The nature of my participation in the proposed research study has been explained to me in

\_\_\_\_\_ by Dr/Mr/Ms \_\_\_\_\_

(Language / Dialect) (Name of healthcare worker)

I have fully discussed and understood the purpose and procedures of this study. I have been given the Participant Information Sheet and the opportunity to ask questions about this study and have received satisfactory answers and information.

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reasons and without my medical care being affected.

I also give permission for information in my medical records to be used for research. In any event of publication, I understand that this information will not bear my name or other identifiers and that due care will be taken to preserve the confidentiality of this information.

\_\_\_\_\_  
[Signature/Thumbprint (Right / Left) of participant] (Date of signing)

**Appendix 12 Pain Stages of Change Questionnaire (Kerns et al., 1997)**

Please tick the box to indicate your level of agreement with each statement.

<b>Precontemplation</b>	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Agree</b>	<b>Strongly agree</b>
1. I have tried everything that people have recommended to manage my pain and nothing helps	1	2	3	4	5
2. My pain is a medical problem and I should be dealing with physicians about it	1	2	3	4	5
3. Everybody I speak with tells me that I have to learn to live with my pain, but I don't see why I should have to	1	2	3	4	5
4. I still think despite what doctors tell me, there must be some surgical procedure or medication that would get rid of my pain	1	2	3	4	5
5. The best thing I can do is find a doctor who can figure out how to get rid of my pain once and for all	1	2	3	4	5
6. Why can't someone just do something to take away my pain?	1	2	3	4	5
7. All of this talk about how to cope better is a waste of my time	1	2	3	4	5

<b>Contemplation</b>					
1.	I have been thinking that the way I cope with my pain could improve	1	2	3	4 5
2.	I have recently realized that there is no medical cure for my pain condition, so I want to learn some ways to cope with it	1	2	3	4 5
3.	Even if my pain doesn't go away, I am ready to start changing how I deal with it	1	2	3	4 5
4.	I realize now that it's time for me to come up with a better plan to cope with my pain problem	1	2	3	4 5
5.	I am beginning to wonder if I need to get some help to cope with my pain problem	1	2	3	4 5
6.	I have recently figured out that it's up to me to deal better with my pain	1	2	3	4 5
7.	I have recently come to the conclusion that it's time for me to change how I cope with my pain	1	2	3	4 5
8.	I'm starting to wonder whether it's up to me to manage my pain rather than relying on physicians	1	2	3	4 5
9.	I have been thinking that doctors can only help so much in managing my pain and that the rest is up to me	1	2	3	4 5
10.	I have been wondering if there is something I could do to manage my pain better	1	2	3	4 5
<b>Action</b>					
1.	I am developing new ways to cope with my pain	1	2	3	4 5
2.	I have started to come up with strategies to help myself control my pain	1	2	3	4 5
3.	I'm getting help learning some strategies for coping better with my pain	1	2	3	4 5
4.	I am learning to help myself control my pain without doctors	1	2	3	4 5
5.	I am testing out some coping skills to manage my pain better	1	2	3	4 5
6.	I am learning ways to control my pain other than medications or surgery	1	2	3	4 5

---

<b>Maintenance</b>					
1.	I have learned some good ways to keep my pain problem from interfering with my life	1	2	3	4 5
2.	When my pain flares up, I find myself automatically using coping strategies that have worked in the past, such as relaxation exercise or mental distraction	1	2	3	4 5
3.	I am using some strategies that help me better deal with my pain problem on a day-to-day basis	1	2	3	4 5
4.	I use what I have learnt to keep my pain under control	1	2	3	4 5
5.	I am currently using some suggestions people have made about how to live with my pain problem	1	2	3	4 5
6.	I have incorporated strategies for dealing with my pain into my everyday life	1	2	3	4 5
7.	I have made a lot of progress in coping with my pain	1	2	3	4 5

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### **Appendix 13 Staging Algorithm of Precaution Adoption Process Model (Weinstein et al., 2008)**

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1. Have you ever heard about (home radon testing)?

No Stage 1

Yes (go to 2)

---

2. Have you (tested your own house for home radon testing)?

Yes Stage 6

No (go to 3)

---

3. Which of the following best describes your thoughts about (testing your home)?

I've never thought about (testing) Stage 2

I'm undecided about (testing) Stage 3

I've decided I don't want to (test) Stage 4

I've decided I do want to (test) Stage 5

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## Appendix 14 Ethics Approval for Study III



**RESEARCH INTEGRITY**  
**Human Research Ethics Committee**  
 Web: [http://sydney.edu.au/research\\_support/ethics/human/](http://sydney.edu.au/research_support/ethics/human/)  
 Email: [ro.humanethics@sydney.edu.au](mailto:ro.humanethics@sydney.edu.au)  
**Address for all correspondence:**  
 Level 6, Jane Foss Russell Building - G02  
 The University of Sydney  
 NSW 2006 AUSTRALIA

SAKR

18 June 2012

Associate Professor Lindy Clemson  
 Discipline of Occupational Therapy  
 Faculty of Health Sciences  
 Email: [lindy.clemson@sydney.edu.au](mailto:lindy.clemson@sydney.edu.au)

Dear Professor Clemson

**Title: Validation of an assessment tool to determine the readiness to change housework behavior among Chinese homemakers with upper limb pain [Protocol No. 14978]**

**PhD Student: Ms Wai Chun Therma Cheung**

The Executive of the Human Research Ethics Committee (HREC) has reviewed your study to include the PhD student – Ms Wai Chun Therma Cheung and acknowledges your right to proceed under the authority of Singhealth Centralized Institutional Review Board.

The Human Research Ethics Committee advises that you consult with The University of Sydney **Audit and Risk Management Office** ([http://sydney.edu.au/audit\\_risk/](http://sydney.edu.au/audit_risk/)) to ensure that University of Sydney staff/students and premises are adequately covered for the purpose of conducting this research project.

Any modifications to the study must be approved by Singhealth Centralized Institutional Review Board. A copy of the approved modification, approved progress report and any new approved documents must be provided to The University of Sydney HREC for our records.

Please do not hesitate to contact Research Integrity (Human Ethics) should you require further information or clarification.

Yours sincerely

**Dr Stephen Assinder**  
 Chair  
 Human Research Ethics Committee

cc Ms Wai Chun Therma Cheung [Email: [therma.cheung.w.c@sqh.com.sg](mailto:therma.cheung.w.c@sqh.com.sg)]

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ABN 15 211 513 464  
 CRICOS 90026A

## **Appendix 15 Participant Information Sheet and Consent Form For Study III**

### **PARTICIPANT INFORMATION SHEET**

You are being invited to participate in a research study.

Before you take part in this research study, the study must be explained to you and you must be given the chance to ask questions. Please read carefully the information provided here. If you agree to participate, please sign the informed consent form. You will be given a copy of this document to take home with you.

#### **STUDY INFORMATION**

##### **Protocol Title:**

Validation of an assessment tool to determine the readiness to change housework behaviour among Chinese housewives with upper limb pain

#### **PURPOSE OF THE RESEARCH STUDY**

You are being invited to participate in a research study of ‘‘ Validation of an assessment tool to determine the readiness to change housework behaviour among Chinese housewives with upper limb pain’ We hope to learn the accuracy of the assessment developed to determine housewives’ readiness to change housework after upper limb pain conditions’ You were selected as a possible subject in this study because you need to do housework at home.

This study will recruit 100 subjects from Occupational Therapy Department of XXX Hospital over a period of one year. About 100 subjects will be involved in this study.

All information obtained during the course of this study will be stored and analysed only for the purposes of this study for a period not exceeding five years, and will be destroyed after completion of the study.

### **STUDY PROCEDURES AND VISIT SCHEDULE**

If you agree to take part in this study, you will be asked to fill in two forms. They are the staging algorithms (from which you only need to tick one that best describes you) and the Pain stages of change questionnaire if you are English speaking, or the Chinese version - University of Rhode Island change assessment if you are Chinese speaking. You only need to fill in the forms once only.

Your participation in the study will be maximum six months in case we need to clarify the data with you on the phone after the completion of the forms.

#### **Schedule of visits and procedures:**

Visit 1: Today will be the only visit for the completion of both forms

#### **YOUR RESPONSIBILITIES IN THIS STUDY**

If you agree to participate in this study, you should fill in two forms as mentioned above.

Be prepared that we may call you for clarification of the information

#### **WITHDRAWAL FROM STUDY**

You are free to withdraw your consent and discontinue your participation at any time without prejudice to you or effect on your medical care. If you decide to stop taking part in this study, you should tell the Site Principal Investigator Lee Hong Rui.

Your doctor, the Principal Investigator and/or the Sponsor of this study may stop your participation in the study at any time for one or more of the following reasons:

Failure to follow the instructions of the Principal Investigator and/or study staff.

The study is cancelled.

**WHAT IS NOT STANDARD CARE OR EXPERIMENTAL IN THIS STUDY**

The study is being conducted because the staging algorithm to assess readiness to change housework is not yet proven to be a valid assessment in housewives with upper limb chronic pain conditions. We hope that your participation will help us to determine whether the assessment is valid for patient education purpose.

**POSSIBLE RISKS, DISCOMFORTS AND INCONVENIENCES**

There are minimal risks, discomforts with this particular research study. Possible inconveniences include the use of your time and energy in filling out the forms.

**POTENTIAL BENEFITS**

If you participate in this study you may reasonably expect to become more aware of your readiness to change housework for the management of your conditions.

There is no assurance you will benefit from this study. However, your participation may contribute to the medical knowledge about the use of this assessment tool.

**SUBJECT'S RIGHTS**

Your participation in this study is entirely voluntary. Your questions will be answered clearly and to your satisfaction.

In the event of any new information becoming available that may be relevant to your willingness to continue in this study, you or your legal representative will be informed in a timely manner by the Principal Investigator or his/her representative.

By signing and participating in the study, you do not waive any of your legal rights to revoke your consent and withdraw from the study at any time.

**CONFIDENTIALITY OF STUDY AND MEDICAL RECORDS**

Information collected for this study will be kept confidential. Your records, to the extent of the applicable laws and regulations, will not be made publicly available. Only your Investigator(s) will have access to the confidential information being collected.

However, Regulatory Agencies, Institution Review Board and Ministry of Health will be granted direct access to your original medical records to check study procedures and data, without making any of your information public. By signing the Informed Consent Form attached, you or your legal representative is authorizing such access to your study and medical records.

Data collected and entered into the assessment forms are the property of XXX Hospital. In the event of any publication regarding this study, your identity will remain confidential.

**COSTS OF PARTICIPATION**

If you complete the study, you will be given a \$5 voucher for your time.

**RESEARCH RELATED INJURY AND COMPENSATION**

The Hospital does not make any provisions to compensate study subjects for research related injury. However, compensation may be considered on a case-by-case basis for unexpected injuries due to non-negligent causes.

By signing this consent form, you will not waive any of your legal rights or release the parties involved in this study from liability for negligence.

**WHO TO CONTACT IF YOU HAVE QUESTIONS**

If you have questions about this research study and your rights or in the case of any injuries during the course of this study, you may contact the Principal Investigator (Insert Name and contact Details here).

If you have questions about the study or your rights as a participant, you can call the XXX Centralised Institutional Review Board, which is the committee that reviewed and approved this study, the telephone number is xxxxxxxx during office hours (8:30 am to 5:30pm).

<b>CONSENT BY RESEARCH SUBJECT</b>	
<b>Details of Research Study</b>	
<b>Protocol Title:</b>	
Validation of an assessment tool to determine the readiness to change housework behaviour among Chinese housewives with upper limb pain	
<b>Principal Investigator:</b>	
<b>Wai Chun Therma Cheung</b>	
<b>Senior Principal Occupational Therapist</b>	
<b>Occupational Therapy Department, XXX Hospital</b>	
<b>Phone number: xxxxxxxx</b>	
<b>Lee Hong Rui</b>	
<b>Occupational Therapist</b>	
<b>Occupational Therapy Department, XXX Hospital</b>	
<b>Phone number: xxxxxxxx</b>	
<b>Subject's Particulars</b>	
Name:	NRIC No.:
Address:	
Sex: Female/Male	Date of birth _____ dd/mm/yyyy
Race: Chinese/ Malay/ Indian /Others (please specify) _____	



**Part I – to be filled by participant**

I, \_\_\_\_\_ (NRIC/Passport

No. \_\_\_\_\_)

(Name of patient)

**agree / do not agree** to participate in the research study as described and on the terms set out in the Patient Information Sheet. The nature of my participation in the proposed research study has been explained to me in

\_\_\_\_\_ by Dr/Mr/Ms \_\_\_\_\_

(Language / Dialect) (Name of healthcare worker)

*I have fully discussed and understood the purpose and procedures of this study. I have been given the Participant Information Sheet and the opportunity to ask questions about this study and have received satisfactory answers and information.*

I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reasons and without my medical care being affected.

*I also give permission for information in my medical records to be used for research. In any event of publication, I understand that this information will not bear my name or other identifiers and that due care will be taken to preserve the confidentiality of this information.*

\_\_\_\_\_  
[Signature/Thumbprint (Right / Left) of participant] (Date of signing)