8. Summary, general conclusion and discussion

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8.1 Introduction

In this chapter, a summary is presented and the main conclusions of this thesis, as they relate to the research questions, are reported and discussed. The contribution of this thesis to theory-related and practice-related issues is evaluated. Finally, methodological remarks are made and recommendations for further research are outlined.

This chapter refers back to the general introduction, in particular to the general research questions postulated by this thesis. Recapitulated from chapter one, the questions are shown in Figure 8.1.

Figure 8.1 Research questions addressed in this thesis

1. How may fatigue and exertion fatigue be conceptualised?
2. How may these concepts be rendered operational in assessment instruments?
3. What is the reliability and validity of the assessment instruments developed, the so-called DUPS and DEFS?
4. What is the clinical significance of the assessment instruments developed, the so-called DUPS and DEFS?

8.2 Summary of the chapters

In relation to research question one: ‘How may fatigue and exertion fatigue be conceptualised?’, a concept analysis of fatigue is described in chapter two of this thesis. Although the interest in studying fatigue is increasing and some models have now been developed, theory development is in its beginning phase. None of the models are empirically evidence-based.

Because of a fundamental and subsequent lack of theories concerning fatigue, a starting level for theory development is suggested at the basis. Thus the primary building blocks or concepts of a theory need to be clearly defined, so that the nature of the phenomenon is explained. Although definitions of fatigue are described in the literature, there is no consensus concerning its nature. This complicates further study of fatigue and limits comparisons between the studies performed. So again, we need to start with a broadly accepted definition,
supported within the discipline of nursing and other disciplines coterminous with a nursing perspective. These arguments advocate adoption of the working definition of fatigue as identified and formulated by the North American Nursing Diagnosis Association (NANDA).

Although the working-definition of the NANDA may be thus adopted, it can also be criticised. One of the weakest points of NANDA’s diagnosis of fatigue is the lack of differentiation in abstraction-level between the label and the defining characteristics. On the other hand, the label and the operability of the concept are logically consistent. Besides the definition of fatigue, different dimensions to the concept are mentioned in the literature. A general résumé of the dimensions are the physical, psychological and social dimensions of fatigue.

Further, the defining characteristics, as described by NANDA, are usable as indicators of fatigue. These defining characteristics refer to the concept of fatigue. A first step in rendering operational the concept of fatigue – research question two – took place.

Finally, in chapter two, indicators referring to the different types of fatigue mentioned in the literature are described. Knowledge regarding different types of fatigue may make precise the diagnostic process and support any subsequent decision as to which interventions need to be carried out.

The decision to start theory development inductively at basis-level leads to a search of the literature covering fifty-three studies on fatigue, bearing in mind the research question: ‘Which sociodemographic, cure-related and care-related factors are significantly related to fatigue?’ This background work is presented in chapter three of the thesis.

A broad range of care-related and care-related factors concerning fatigue could be found in this literature search. Furthermore, the correlates between the various (patient) populations showed similar results. This finding supports the idea of the nonspecific character of fatigue. Because of the lack of experimental and fundamental research, no causal relationships could be determined.

In addition, suggestions of interventions aimed at successful outcomes are given. The intervention of primary effectiveness and the one most often suggested within the range of this background study is ‘energy management’.

Finally, a multidisciplinary model for further research is explored. Although each discipline has its own perspective on fatigue, in general, fatigue is a non-discipline-related phenomenon. This research model integrates care-related and care-related perspectives.

Chapter four presents the development, reliability and validity of the Dutch Fatigue Scale (DUF5) and the Dutch Exertion Fatigue Scale (DEFS). This study reports further upon the operability of the concepts concerning fatigue and exertion fatigue in assessment instruments and psychometric testing of the scales, relating to research questions two and three.

The concept of exertion fatigue is described. This concept is related to activities in the fields of household, personal hygiene and social life. On the basis of hypotheses, the defining characteristics of the concepts fatigue (DUF5) and exertion fatigue (DEFS) are identified. Attention is given to the inter-criterion-related validity. The DUFS is suitable for the assessment-level. The DEFS may be used as an assessment-level.

Chapter five continues the psychometric analysis, i.e., testing the sensitivity, specificity, positive predictive value and the area under the ROC curve of the DUFS amongst chronic patients. This study shows that the DUFS is applicable among healthy persons. Although the DUFS was validated among healthy persons, a cut-off point in the absence of fatigue and fatigue was found.

In conclusion, the next research question concerned the definition and classification of fatigue and exertion fatigue. Consequently, the next research problem is concerned with the definition and classification of fatigue and exertion fatigue. In this study, the result refers to the patient’s point of view. In concurrence with the concept of non-specific character of fatigue and the continuum moving from the non-fatigued state to the state of exhaustion, the fatigue state is defined as the continuum moving from the non-fatigued state to the state of exhaustion.

One interesting point of study is to determine the significance of the concept of fatigue and the concept of exertion fatigue. This question could be answered by testing the specific and non-specific character of fatigue and exertion fatigue. Consequently, the next research question is concerned with the definition and classification of fatigue and exertion fatigue. In this study, the result refers to the patient’s point of view. In concurrence with the concept of non-specific character of fatigue and the continuum moving from the non-fatigued state to the state of exhaustion, the fatigue state is defined as the continuum moving from the non-fatigued state to the state of exhaustion.

Chapter six presents a study that determines the clinical significance of the so-called DUFS and DEFS. It is tested whether the DUFS and DEFS enable accurate and specific classification of types of fatigue in domiciliary settings.

In this study, the results are classified at three levels of severity, using raw scores of the scales, and finally classifying the DUFS and DEFS at the assessment-level.

A good measure of agreement exists between the patient’s and their significant others and this
other disciplines coterminous with the adoption of the working concept as related by the North American Nursing Diagnosis Association (NANDA).

It may be thus adopted, it can be alleged, NANDA’s diagnosis of fatigue, an operational definition between the label and the concept and the operability of the concept are centralized due to the concept analysis of fatigue by NANDA, are usable as partial characteristics of the concept of fatigue – research regarding different types of fatigue could be determined. At successful outcomes are the ones most often referred to as ‘energy management’. In general, fatigue is a non-energetic state, and the concept is related to activities in social life. On the basis of the concept, fatigue (DUFS) and exertion fatigue (DEFS) are tested among chronic heart failure patients. Attention is given to the internal consistency, to the construct validity and criterion-related validity. The psychometric testing showed sufficient results. The DUFS is suitable for the assessment of fatigue at group-level and the DEFS may be used as an assessment instrument for exertion fatigue at individual-level.

Chapter five continues the psychometric testing of the DUFS. In this chapter the sensitivity, specificity, positive predictive value and negative predictive value of the DUFS amongst chronic heart failure patients and postnata!al women is tested. These tests refer substantially to the research questions three (reliability and validity) and four (clinical significance).

This study shows that the DUFS is useful amongst healthy as well as amongst diseased persons. Although the DUFS was developed as a result of pilot studies carried out among diseased subjects, this does not preclude its usefulness among healthy persons. Furthermore, a cut-off point in the DUFS-sumscore could be estimated which allowed discrimination between fatigued and non-fatigued patients. In concurrence with the concept analysis of fatigue – fatigue seen as a continuum moving from tiredness, advancing to fatigue and at last reaching a state of exhaustion - non-fatigued persons showed low average DUFS-sumscores referring to their state of tiredness.

One interesting point of study in chapters six and seven is the overall question of whether or not it is possible to assess the subjective feelings of another person. This refers to the dichotomy between self-assessment in a person (intrinsic point of view) and the assessment made by others (extrinsic point of view), for instance, significant others (chapter six) or nurses (chapter seven). Before this question could be answered, the DUFS and DEFS had to be validated. It could be concluded that the clarification and operability of the concepts fatigue and exertion fatigue fitted with the empirical reality. Consequently, the next research question involved testing the clinical significance of the DUFS and DEFS in practice. For this purpose, various viewpoints of both the patient and their significant other - intrinsic and extrinsic points of view - are brought together and compared.

Chapter six presents a study that refers particularly to research question four – ‘What is the clinical significance of the assessment instruments developed, the so-called DUFS and DEFS?’. The question posed in this chapter is: ‘Are significant others able accurately to assess fatigue, exertion fatigue and other types of fatigue in domiciliary heart patients?’

In this study, the results gathered from patients and their significant others are compared at three levels of measurement: item-level of the scale, the sumscores of the scales, and finally, based on the cut-off points of DUFS and DEFS, the assessment-level. A good measure of agreement emerges in this study between the patients and their significant others and this degree of consensus increases from item-level
The main conclusion of this study is that significant others are able accurately to assess patients' fatigue, exertion fatigue and types of fatigue. The patient and the significant other came to the same conclusion independently of one another. Thus the question as to whether or not someone is able to assess the subjective feelings of another person can be answered positively.

Chapter seven reports on the question involving whether or not nurses are able accurately to assess fatigue, exertion fatigue and other types of fatigue in residential home patients. Using the same methods described in chapter six - the ability to assess fatigue and exertion fatigue from an extrinsic point of view - the measures of agreement between the nurses and residential home patients are compared.

It may be seen in this chapter that, in contrast to the significant others in the previous chapter, nurses are unable to assess accurately patients' fatigue, exertion fatigue and types of fatigue. The measures between the patients and the nurses showed slight and fair agreements. It must consequently be concluded that the DUFS and DEFS are not appropriate for use by nurses only.

A second conclusion of this study is that nurses cannot blindly follow their extrinsic assessment of patients’ subjective feelings. Nurses must always compare their extrinsic assessment with the intrinsic assessment of the patients. But above all, nurses have to be aware that, in checking the extrinsic with the intrinsic assessment, their behaviour is appropriate in terms of their professional attitude.

8.3 Main conclusions

Going back to the general research questions which form the subject matter of this thesis, the following main conclusions emerge.

1. How may fatigue and exertion fatigue be conceptualised?

- Fatigue may be defined as ‘an overwhelming, sustained sense of exhaustion and decreased capacity for physical and mental work’ (NANDA, 1993). Although this definition demonstrates that the level of fatigue and the capacity for work are connected, nothing is said about a possible and necessary coincidence of causality between both aspects.
- Exertion fatigue is defined as ‘fatigue that is directly related to activity’. The intensity of fatigue may be caused by the level of activity and the level of activity may be caused by the intensity of fatigue. Although the direction of the relationship between fatigue and activity may alter, they are directly related.
- Different types of fatigue are conceptualised using the indicators of duration, intensity, predominance, pattern, specificity and explicable. The following types could be identified: acute and chronic fatigue, intense and non-intense fatigue; predominant and constant fatigue; specific and diffuse fatigue.

2. How may these concepts be operationalised?

- Different dimensions of fatigue, classification of the most frequent types, psychological and social dimensions, are useful in assessment.
- A wide range of defining characteristics of fatigue, differing perspectives, are described. The defining characteristics were used as a basis for validation and application of the DUFS (scale of fatigue). The DUFS characteristics were used as a measurement instrument for the assessment of fatigue.
- Psychometric testing of the DUFS reduced the number to nine items, which form a five response alternative scale with five response alternatives. Appendix L up to and including Appendix L, to be recoded dichotomously: yes (1) no (0).
- For the development of the DEFS (scale of fatigue), different questions and criteria from different fields of household, personal and professional life were used as a starting point.
- From the 62 selected activities in the DEFS, seven scales were derived. The DEFS is a scale with yes (4) no (0) responses (see Appendix V, up to and including Appendix L, to be recoded dichotomously: yes (1) no (0). The DEFS may range from 0 to 9.

3. What is the reliability and validity of the so-called DUFS and DEFS?

- Psychometric testing of both scales showed excellent internal consistency, validity and reliability. Statistical analyses of both scales showed the following.
- The DUFS (scale coefficients ranging from 0.6 to 0.8) may be used reliably and validly for the assessment of fatigue.
- The DEFS (scale coefficients ranging from 0.7 to 0.8) may be used reliably and validly for the assessment of fatigue.

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