Fatigue and exertion fatigue
Tiesinga, Lucas Jan

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
1999

Link to publication in University of Groningen/UMCG research database

Citation for published version (APA):
Tiesinga, L. J. (1999). Fatigue and exertion fatigue: from description through validation to application of the Dutch Fatigue Scale (DUFS) and the Dutch Exertion Fatigue Scale (DEFS). s.n.

Copyright
Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the “Taverne” license. More information can be found on the University of Groningen website: https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment.

Take-down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): http://www.rug.nl/research/portal. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.
8. Summary, general conclusion and discussion

Lucas J. Tiesinga

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 DUFS and DEFS?
4. What is the clinical significance of the assessment instruments developed, the so-called DUFS 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 cure-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 cure-related and care-related perspectives.

Chapter four presents the development, reliability and validity of the Dutch Fatigue Scale (DFS) 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 (DFS) and exertion fatigue (DEFS) are presented. Attention is given to the inter-criterion-related validity. The DFS may be used as an assessment-level.

Chapter five continues the psychometric validity, the sensitivity, specificity, positive value of the DFS amongst chronically ill persons is tested. These tests refer specifically to (reliability and validity) and four questions. This study shows that the DFS may be used as an assessment-level.

In addition, a cut-off point in the DFS carried out among diseased subjects and among healthy persons. Furthermore, a cut-off point in DFS may allow discrimination between chronic fatigue and non-fatigue (reliability and validity) and four questions.

This study shows that the DFS among healthy persons. Although the DFS may be used as an assessment-level.

In concurrence with the concept of the continuum moving from tiredness to state of exhaustion – non-fatigue (DEFS) and DFS refers to their state of health.

One interesting point of study is the feasibility of whether or not it is possible to carry out among healthy persons. Although the DFS may be used as an assessment-level.

Consequently, the next research question is the following: ‘What is the clinical significance of the DFS and DEFS?’

Chapter six presents a study that is the following: ‘What is the clinical significance of the DFS and DEFS?’

In this study, the results gathered are compared at three levels of summation: the DFS, the DEFS, the summation-level.

A good measure of agreement could be obtained between the DFS and DEFS, the assessment-level.

Consequently, the next research question is the following: ‘What is the clinical significance of the DFS and DEFS?’

Chapter six presents a study that is the following: ‘What is the clinical significance of the DFS and DEFS?’

In this study, the results gathered are compared at three levels of summation: the DFS, the DEFS, the assessment-level.

A good measure of agreement could be obtained between the DFS and DEFS, the assessment-level.

Consequently, the next research question is the following: ‘What is the clinical significance of the DFS and DEFS?’

Chapter six presents a study that is the following: ‘What is the clinical significance of the DFS and DEFS?’

In this study, the results gathered are compared at three levels of summation: the DFS, the DEFS, the assessment-level.

A good measure of agreement could be obtained between the DFS and DEFS, the assessment-level.
other disciplines coterminous with the concept of fatigue. It is adopted, it can be seen that the American NANDA’s diagnosis of fatigue level between the label and the concept are the different dimensions of fatigue, as defined by NANDA, are usable as

ratings refer to the concept of the concept of fatigue – research

factors concerning fatigue could be determined.

at successful outcomes are and the one most often y is ‘energy management’. Research is explored. Although in general, fatigue is a non-

and validity of the Dutch ‘fatigue Scale (DEFS). This concept is related to activities social life. On the basis of concepts 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 postnatal 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 scales, 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
(DUFS & DEFS: moderate), scale-level (DUFS & DEFS: substantial), to
assessment-level (DUFS: substantial; DEFS: almost perfect).
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 explicability. The
  following types could be identified: acute and chronic fatigue, intense and non-
  intense fatigue; predominant constant fatigue; specific and
  intense fatigue.

2. How may these concepts be measured?

- Different dimensions of fatigue and types of fatigue were classified into:
  psychological and social dimensions, which proved useful in assessment.
- A wide range of defining characteristics, derived from different
  classifications of the most frequently mentioned fatigue types in
  psychological and social dimensions, were selected and used as
  characteristics were used as a basis for defining the DUFS and DEFS.
- Psychometric testing of the DUFS reduced the number to nine items.
  Psychometric testing of the DEFS reduced the number to nine items.
- For the development of the DUFS, different questionnaires from
different fields of work were used as a starting point.

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

- Psychometric testing of both instruments demonstrated internal consistency, validity,
  and reliability. Statistical analyses of both scales showed:
  - The DUFS (scale coefficient: 0.89) is a reliable and valid measurement instrument for the assessment
    of fatigue.
  - The DEFS (scale coefficient: 0.87) is a reliable and valid measurement instrument for
    the assessment of fatigue.