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The effects of rehabilitation on intellectually disabled people - a systematic review

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The effects of rehabilitation on intellectually disabled people – a systematic review

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North-West University
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DECLARATION

I declare that the dissertation with the title: **The effects of rehabilitation on intellectually disabled people – a systematic review** is my own work and that all the sources that have used or quoted have been indicated and acknowledged by means of complete reference and that this work has not been submitted previously for any other degree at any other institution.

....

Ernest Joshua Sechoaro **Date**

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This letter serves as proof that Ernest Sechoaro's mini-dissertation, entitled: The *effects of rehabilitation on intellectually disabled people – A systematic review*, has been professionally edited.

Kind regards

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ABSTRACT

Background: Rehabilitation has emerged as a comprehensive approach with a combination of treatment modalities to address the multiple impediments associated with disabilities in intellectually disabled people. Rehabilitation is used to address intellectually disabled peoples' skill deficits, to improve competencies and to facilitate optimal functioning within the goal of giving the greatest possible measure of social and economic participation, independence, self-reliance and self-determination to intellectually disabled people. The ongoing improvement of rehabilitation services in the public health system therefore remains a continuous challenge; hence the need for further research.

Objective: The systematic literature review critically synthesizes and describes the available evidence of the effects of rehabilitation on intellectually disabled people.

Method: Literature searches of different electronic databases as well as manual searches of references of primary studies were conducted using selected keywords. The total number of the studies identified from an electronic database search was 1 102. All titles and abstracts were screened for relevance and 40 studies were immediately excluded. From the remaining 1 062 studies, another 993 studies were excluded because they were not relevant to the rehabilitation of intellectually disabled people. The abstracts and titles of the remaining 69 studies were screened for a second time to exclude studies not relevant to actual rehabilitation of intellectually disabled people. Another two studies were excluded as duplicates. The remaining 67 studies were retrieved as full texts; of these, 40 studies were excluded due to them being written in a foreign language. After all abstracts and texts were thoroughly screened for true relevancy to the review question, a further 20 studies were excluded. The

remaining seven full-text studies were selected for critical appraisal because they were relevant to the effects of rehabilitation on intellectually disabled people.

Results: These identified studies have the potential to inform clinical practice on the basis of their evidenced interventions that resulted in the improvement of outcomes of rehabilitation of intellectually disabled people. Improvement of skills was noted for mildly and moderately intellectually disabled people. Improvement was noted in activities of daily living (ADL), self-care skills, communication skills and cognitive achievements.

Conclusions: The study contributes to the comprehensive nursing care of intellectually disabled people by endorsement of the effectiveness of rehabilitation in terms of ADL, self-care skills, communication skills and cognitive achievements. The collected evidence of this study may contribute to the education of more effective nurse practitioners involved in the daily care and rehabilitation of intellectually disabled people.

Key concepts: Effects, rehabilitation, intellectually disabled people.

OPSOMMING

Agtergrond: Rehabilitasie het ontwikkel in ’n omvattende benadering met ’n kombinasie van behandelingsmetodes om die veelvoudige hindernisse wat met intellektuele gestremdheid geassosieer word die hoof te bied. Rehabilitasie word gebruik om die intellektueel gestremde persoon se vaardigheidstekorte aan te pak, bevoegdheid te bevorder en optimale funksionering te fasiliteer met die beste moontlike sosiale en ekonomiese deelname, onafhanklikheid, selfstandigheid en selfbeskikking as doelwit. Die deurlopende verbetering van rehabilitasiedienste in die openbare gesondheidstelsel bly dus ’n voortgesette uitdaging en skep daarom ’n behoefte aan verdere navorsing.

Doelstellings: Hierdie sistematiese literatuuroorsig het die beskikbare bewyse van die effek van rehabilitasie op intellektueel gestremde mense krities gesintetiseer.

Metode: Literatuursoektogte van verskillende databasisse, asook fisiese soektogte van verwysings na primêre studies is met behulp van gekose sleutelwoorde uitgevoer. In totaal is 1 102 studies deur ’n soektog van elektroniese databasisse geïdentifiseer. Alle titels en opsommings is nagegaan vir toepaslikheid en 40 studies is onmiddellik uitgesluit. Uit die oorblywende 1 062 studies is ’n verdere 993 studies uitgesluit omdat dit nie toepaslik is op die rehabilitasie van intellektueel gestremde mense nie. Die opsommings en titels van die oorblywende 69 studies is vir ’n tweede keer deurgegaan om studies uit te sluit wat nie toepaslik is op werklike rehabilitasie van intellektueel gestremde mense nie. Twee studies is uitgesluit omdat hulle duplikate was. Die oorblywende 67 studies is as volledige tekste verkry; hiervan is 40 studies uitgesluit omdat hulle in ’n vreemde taal geskryf is. Nadat alle opsommings en tekste deeglik nagegaan is vir toepaslikheid op die oorsigvraag, is ’n verdere 20 studies uitgesluit. Die

oorblywende sewe volledige studies is vir kritiese beoordeling gekies omdat hulle betrekking het op die uitwerking van rehabilitasie op intellektueel gestremde mense.

Resultate: Hierdie geïdentifiseerde studies het die potensiaal om kliniese praktyk te rig op grond van hul bewese intervensies wat gelei het tot die verbetering van intellektueel gestremde mense se uitkomste gedurende rehabilitasie. Verbetering van vaardighede is gemerk vir ligte en matige intellektuele gestremdheid. Verbetering is gemerk in daaglikse leefaktiwiteite, selfsorgvaardighede, kommunikasievaardighede en kognitiewe prestasies.

Gevolgtrekkings: Hierdie studie dra by tot die omvattende verpleging van intellektueel gestremde mense deur ondersteuning van die doeltreffendheid van rehabilitasie met betrekking tot daaglikse leefaktiwiteite, selfsorgvaardighede, kommunikasievaardighede en kognitiewe prestasie. Die bewyse wat in hierdie studie ingesamel is, kan bydra tot die opleiding van doeltreffender verpleegkundiges wat by die daaglikse versorging en rehabilitasie van intellektueel gestremde mense betrokke is.

Sleutelwoorde: Effekte, rehabilitasie, intellektueel gestremde mense

TABLE OF CONTENTS

CHAPTER 1 ..... **1**
OVERVIEW OF THE RESEARCH STUDY **1**
1.1 INTRODUCTION **1**
1.2 BACKGROUND **1**
1.3 PROBLEM STATEMENT **6**
1.4 RESEARCH QUESTION **7**
1.5 RESEARCH OBJECTIVE **7**
1.6 THE PURPOSE OF THIS STUDY **8**
1.7 PARADIGMATIC ASSUMPTIONS **8**
1.7.1 Meta-theoretical assumptions 8
1.7.1.1 Humankind 8
1.7.1.2 Nursing 8
1.7.1.3 Health 9
1.7.1.4 Illness/disease 9
1.7.1.5 Environment 9
1.7.2 Theoretical assumptions 10
1.7.2.1 Central theoretical assumption 10
1.7.2.2 Theoretical definitions 10
1.7.2.2.1 Effects 11
1.7.2.2.2 Intellectually disabled person 11
1.7.2.2.3 Rehabilitation 12
1.7.3 Methodological assumptions 12
1.8 RESEARCH METHOD **13**
1.9 RIGOUR **15**
1.10 ETHICAL CONSIDERATIONS **18**
1.11 CHAPTER DIVISION **19**
1.12 SUMMARY **19**

CHAPTER 2 ..... **20**
RESEARCH METHOD **20**
2.1 INTRODUCTION **20**
2.2 STEPS OF THE SYSTEMATIC REVIEW **20**
2.2.1 Step 1: Formulate a review question 22
2.2.2 Step 2: Generate a search strategy 23
2.2.2.1 The study selection criteria and procedures 24
2.2.2.2 Inclusion criteria 26
2.2.2.3 Exclusion criteria 26
2.2.2.4 The keywords 26
2.2.3 Step 3: Conduct the search 26
2.2.4 Step 4: Critically appraise relevant studies 27
2.2.5 Step 5: Extract data and summarise all relevant studies that comply with the selection criteria 28
2.3 SUMMARY **29**
CHAPTER 3 ..... **30**
REALISATION AND FINDINGS OF THE RESEARCH **30**
3.1 INTRODUCTION **30**
3.2 STEP 1: FORMULATE A REVIEW QUESTION **30**
3.3 STEP 2: IDENTIFYING RELEVANT STUDIES FOR INCLUSION (SAMPLING PROCEDURE) **31**
3.3.1 Inclusion and exclusion criteria 32
3.3.2 Sources 33
3.3.3 Keywords 34
3.4 STEP 3: CONDUCT THE SEARCH **37**
3.4.1 Selection of studies 37
3.5 STEP 4: CRITICALLY APPRAISE RELEVANT STUDIES **46**
3.5.1 Quality assessment. 46
3.5.2 Evidence class rating 48
3.5.3 Critical synthesis 50
3.6 SUMMARY **51**
CHAPTER 4 ..... **52**
FINDINGS OF THE STUDY AND SUMMARISING EVIDENCE **52**

4.1 INTRODUCTION 52
4.2 STEP 5: DATA EXRACTION AND SYNTHESIS 52
4.2.1 Characteristic of the final sample 52
4.2.1.1 Randomised control trials (RCT) (2) 52
4.2.1.2 Cohort study (1) 53
4.2.1.3 Single-case design (3) 53
4.2.1.4 Qualitative research (1) 53
4.2.1.5 Data extraction and summary 54
4.2.2 Analysis strategy 62
4.2.3 Summary of findings 62
4.3 SUMMARY 65
CHAPTER 5 65
CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS 66
5.1 INTRODUCTION 66
5.2 CONCLUSIONS 66
5.3 EVALUATION OF RIGOUR 69
5.3.1 Problem-identification stage 69
5.3.2 Literature search stage 70
5.3.3 Critical appraisal stage 70
5.3.4 Data synthesis stage 71
5.3.5 Presentation 71
5.4 LIMITATIONS 71
5.5 RECOMMENDATIONS 72
5.5.1 Recommendations for nursing practice 72
5.5.2 Recommendations for nursing education 73
5.5.3 Recommendations for nursing research 73
5.6 AIM 73
5.7 SUMMARY 73
LIST OF REFERENCES 75

LIST OF TABLES

Table 1.1: Steps of systematic review **14**
Table 1.2: Strategies to enhance rigour **15**
Table 2.1: Steps of the systematic review **21**
Table 2.2: Review question in PICOT format **22**
Table 2.3: Databases for formal search **24**
Table 2.4: Inclusion and exclusion criteria with rationale for this study **25**
Table 3.1: Components of the research question **31**
Table 3.2: Sources used in the search strategy **33**
Table 3.3: Databases with keyword combinations used in the search **35**
Table 3.4: Excluded articles written in a foreign language **40**
Table 3.5: Excluded articles, with exclusion rationale **43**
Table 3.6: Classes of evidence **49**
Table 3.7: Quality rating **50**
Table 4.1: Data extraction of systematic reviews included for synthesis of evidence **55**

LIST OF FIGURES

Figure 3.1: The realization of the search strategy **39**

APPENDIXES

APPENDIX A: Cusp checklists **82**
APPENDIX B: ADA checklists **93**
APPENDIX C: John Hopkins checklist **99**

ABBREVIATIONS

ADA	American Dietetic Association
ADL	Activities of daily living
CASP	Critical Appraisal Skills Programme
CBR	Community-based rehabilitation
CRD	Center for Reviews and Dissemination
HCPRDU	Health Care Practice Research and Development Unit
IQ	Intelligence quotient
JHNEBP	The John Hopkins Nursing Evidence-based Practice
PHRU	Public Health Resource Unit
PICOT	Patient/population, Intervention, Comparison, Outcome and Time
RCT	Randomised control trial

CHAPTER 1
OVERVIEW OF THE RESEARCH STUDY

1.1 INTRODUCTION

This mini-dissertation focused on synthesizing and describing the best evidence of the effects of rehabilitation on intellectually disabled people by means of a systematic review. Chapter 1 gives an overview of the introduction; the background; the rationale and problem statement, which is the reason for the current research; the research question and the objective of the study; paradigmatic assumptions; the research methodology; rigour; ethical considerations; and the chapter division. Chapter 2 consists of the study methodology on the basis of which the research was conducted, while chapter 3 reports on data gathering, the realisation and the findings of the research study. Chapter 4 includes the findings of the study and summarises the evidence. Chapter 5 gives the conclusions, recommendations and limitations of the study.

1.2 BACKGROUND

People with intellectual disabilities have complex needs and limitations in terms of bodily functions, personal factors and activity skills, and these pose significant challenges for them as well as for health care professionals (Lin *et al.,* 2006:1499). In reviewing the historical evolution of the term 'mental retardation', Thompson *et al*. (2002:26) state that the term has changed over time and has been replaced by the term 'intellectual disability'. Luckasson *et al*. (cited in Thompson *et al*., 2002:30) define mental retardation as disability characterised by significant limitations in terms of both intellectual functioning and conceptual, social and practical adaptive skills manifesting before the age of 18. Uys and Middleton (2004:490) support this definition by also conceptualising intellectual disability as "significant sub-average intellectual functioning associated with concurrent impairments in adaptive behaviour manifested during the developmental period with the onset before the age of 18". Saloojee *et al.* (2006:231) highlight that people with intellectual disabilities may also have health conditions leading

to their activities being limited and some difficulties in performing functional activities, which have a long-term effect and also add to their challenges.

Because intellectually disabled people have a wide range of limitations in areas such as recognition and social adaptation skills and because they are more prone to chronic, lifelong physical, mental and social conditions, they require specific forms of health and special social services (Lin *et al.,* 2006:1499). Thompson *et al*. (2002:25) believe that efforts can be made to improve on methods that can lead to effective interventions to increase learning and adaptation of intellectually disabled people. The improvement of rehabilitation services for intellectually disabled people remains an ongoing challenge in the public health system (Lin *et al.,* 2006:1500). Based on these challenges, a model of service delivery was established to address intellectually disabled people's skills deficits and barriers. The educational model of rehabilitation is a relevant model to meet these challenges (Lin *et al.,* 2006:1500). According to this model, rehabilitation involves the process of teaching people the skills or competencies required to maximise their functioning with minimum effort within the community (Lin *et al*., 2006:1499-1500). Health care professionals therefore started to adopt these psychosocial rehabilitation principles in order to transform custodial models of care to a highly interactive educational and skills-building programme (Longo *et al.,* 2002:205-213).

Robertson *et al*. (2001:422) define rehabilitation as the process that aims to facilitate optimal functioning of ill and disabled people with the goal of giving them the greatest possible measure of social and economic participation, independence and self-determination. Uys (2005:272-273) claims that the theoretical understanding of rehabilitation is limited to the definition that states that rehabilitation commences with diagnosis and aims at achieving the best possible use of the remaining capacities of a person with a disability. According to Gelder and Harrison (2006:637), rehabilitation denotes procedures for helping intellectually disabled people to reach and maintain their best level of functioning and it offers great potential in balancing cost containment, while providing quality services in managed care systems. Rehabilitation means a goal-oriented and time-limited process aimed at enabling intellectually disabled people to

reach an optimum mental, physical and/or social functional level, thus providing them with the tools to change their lives (Department of Health, 2000:31).

Rehabilitation has emerged as a comprehensive approach with a combination of treatment modalities with the purpose of addressing multiple impediments and overcoming disabilities. Rehabilitation is also closely associated with the recovery movement, a worldwide social movement that seeks to reverse the stigma, to empower intellectually disabled people and to define maximal recovery as the ultimate outcome criterion (Iyer *et al.,* 2005:43). In this context, recovery means overcoming the intellectually disabled person's functional disabilities and achieving the best possible quality of life (Iyer *et al.,* 2005:43). The philosophy behind rehabilitation is that rehabilitation concentrates more on prevention or reduction of impairment of handicap than on treatment of diseases. It is strongly grounded on the belief in the empowerment of intellectually disabled people. It identifies the individual's goals on the grounds of which a plan is developed to meet these goals. From this rehabilitation perspective, it is important to extend support as long as possible. Furthermore, this support should not be withdrawn when the client improves (Lin *et al.,* 2006:1499-1500).

The major goals of rehabilitation are:

- to prevent further impairment and disability;
- to support adaptation to recovery from illness or disability;
- to maximise functional independence; and
- to improve and maintain the disabled people' bio-psychosocial status for community-based living and adaptation (Lin *et al*., 2006:1549).

To add to this, Legere (2007:228) cites the importance of rehabilitation by stating that if individuals can be helped to cope with their immediate situations and, in the process, learn new life skills, intellectually disabled people's general functioning will improve and this will maximise their full participation in life and society.

Looking at international trends, prompted by the United Nation's actions to declare the rights of intellectually disabled people and to adopt the Declaration of the Rights of

Disabled People in 1975, the Rehabilitation Act of 1973 of the USA mandated prioritisation of rehabilitation services for people with disabilities (Lin *et al.,* 2006:1499-1500). The South Korean government enacted the promotion of the Special Education Act in 1977, this regulation and the first legal policy established promoted normalisation, mainstreaming, inclusive education, early education and individualised education, thus improving the educational opportunities for people with disabilities (Oh *et al*., 2005:50). The historical overview of rehabilitation from Southern Korean literature reiterates that rehabilitation started to develop only in the early 1950's. The South Korean government afforded to expand social services to include rehabilitation for people with disabilities (Oh *et al.,* 2005:49). Despite progress made, there were still many problems and limitations in the delivery of vocational rehabilitation services (Oh *et al.,* 2005:49). In the 1960's, many medical doctors who had been trained in the USA in rehabilitation medicine and other specialties returned to South Korea and helped in orthopaedic and rehabilitation departments in major hospitals. Soon thereafter, resident training programmes were developed in these specialty fields (Oh *et al.,* 2005:50).

In South Africa, the current estimates for the proportion of the South African population with disabilities converge at five to six per cent of the population, equal to around 2, 5 million people with disabilities in South Africa. Therefore, there is a need for appropriate policies and services for this sector of the population. Chappell and Johannsmeier (2009:7) further elucidate that community-based rehabilitation (CBR) developed in the late 1980s as a result of challenges faced by people with disabilities. Since that time, CBR has been recognised by the South African government in the Integrated National Disability Strategy White Paper as "forming the basis of the National Rehabilitation Strategy" (Chappell and Johannsmeier, 2009:7).

The National Rehabilitation Policy Document (2000:3) is in agreement with the above and facilitates the realisation of every citizen's constitutional right of access to health care services. This policy document serves as a vehicle to bring about the equalisation of opportunities and to enhance human rights for people with disabilities. This policy document also forms part of the strategy to improve the quality of life of people with disabilities. Previously, the Mentally Retarded Children's Training Act No. 63 of 1974

governed the education of intellectually disabled people, later repealed by the Education Affairs Act No. 70 of 1988 and subsequently placed under the South Africa Schools Act No. 84 of 1996. This Act outlines that people with intellectual disabilities need specialised education that suit their needs to facilitate their adaptation. Section 29 of the Act declares that educational institutions must ensure the provision of specialised education at institutions other than public schools (Uys, 2005:112-113).

Burns (2008:46) gives an overview of the historical background of the previous South African legislation relating to the treatment of mental health care users, including people with disabilities. Burns states that the Mental Health Act (18 of 1973) (South Africa, 1973) focused on the control and treatment of these patients. This Act also reinforced separation of mental health care from general health care. Psychiatric services were isolated and were not integrated into primary health care. The structure of these old systems disempowered, alienated and stigmatised mentally ill and intellectually disabled people, with traumatic and damaging consequences. The psychiatric service provision under the Mental Health Act (18 of 1973) (South Africa, 1973) was not truly based on ethical principles of autonomy, beneficence, non-maleficence and justice, which led to human rights infringements (Burns, 2008:46).

Because change was necessary, the Mental Health Care Act (17 of 2002) (South Africa, 2002) was promulgated in South Africa against the backdrop of positive international developments in mental health legislation. This new culture focused on human rights. The new Mental Health Care Act reflects the new spirit and is based on the important principle of provision of care, treatment and rehabilitation. Mentally disabled people's rights are respected, in other words their rights to be provided with care, treatment and rehabilitation, with the least possible restriction of their freedom (Burns, 2008:47).

Uys (2005:272-273) also adds that the South African system is in the process of moving from the traditional hospital/urban/specialist mode of delivery to a primary health care approach. This aims at improving the integration of mental health care, including mental disorders, especially at primary level. In order for intellectually disabled people to become socially integrated, they should be afforded the opportunity to develop and

participate in the community. This means that inclusive living is a prerequisite for intellectually disabled people (Grunewald, 2003:2-4).

In conclusion, Legere (2007:227) further elaborates that rehabilitation enables the maximisation of a person's functional abilities and that intellectually disabled people will learn to improve skills needed for walking, eating or self-care management. Martin (2006:125-126) supports the above by stating that intellectually disabled people must learn to take decisions for their self-care. Without learning and applying these skills, intellectually disabled people will be hospitalised repeatedly due to lack of learned skills. People with intellectual disabilities should receive services and support that will enable them to live a productive and fulfilling life, legally protected from unfair treatment and exploitation. The rehabilitation of intellectually disabled people should be applied in practice to enhance their functional skills and to improve their quality of life. In this study, a systematic review was conducted to yield knowledge that will ultimately lead to better understanding of available systems of learning and support.

Thus, exploring the effects of rehabilitation may guide and increase knowledge to meet the challenges faced by intellectually disabled people. Due to the gap of functional skills deficits in intellectually disabled people, the researcher identified the need to explore the effects of rehabilitation on intellectually disabled people. In reflection, the major effect of rehabilitation on intellectually disabled people may be positive client outcomes, which include improved functional skills levels, adaptation to recovery from disability, maximised functional independence with the least amount of ongoing professional assistance and maintained bio-psychosocial status for community-based living, marked by growth towards autonomy and achieving a full, rich and fulfilling life.

1.3 PROBLEM STATEMENT

According to the literature, there is a growing demand for interdisciplinary rehabilitation for people with intellectual disabilities (Lin *et al.,* 2006:1500). Although considerable research has been done, it is still fragmented and there is still a need for synthesised evidence on the rehabilitation of intellectually disabled people. Since people with intellectually disabilities encompass a wide range of limitations, if not exposed to

rehabilitation training they will have functional skills deficits (Lin *et al.,* 2006:1499-1500). In this light, I realised that intellectually disabled people need help and assistance to alter this effect. Rehabilitation and training are essential to meet functional skills needs and challenges faced by intellectually disabled people. The researcher identified the need for a systematic review of all available research on the effects of rehabilitation on intellectually disabled people as knowledge regarding interventions that enhance the intellectually disabled person's day-to-day functioning is crucial. The rationale for crafting the treatment modality of rehabilitation to intellectually disabled people was to improve their social competency, functionality, community adjustment and quality of life and preventing the consequences of long-term institutionalisation.

Therefore, the focus of this study was on the rehabilitation of intellectually disabled people in institutional and community settings. The intention of this study was to critically appraise and synthesise best evidence from research data published in this field to contribute to the scientific knowledge base of nursing. A comprehensive systematic literature review and critical synthesis of the evidence will help nurses and health care professionals to understand the effects of rehabilitation on intellectually disabled people. Rehabilitation may be a solution to help to improve intellectually disabled people's functional skills, may help them to reach their optimum potential and may empower them as productive members of society (Department of Health, 2000:1-3).

1.4 RESEARCH QUESTION

From the above problem statement, the following question was formulated:

"What is the best evidence on the effects of rehabilitation on intellectually disabled people?"

1.5 RESEARCH OBJECTIVE

The research objective of this study was to critically synthesize the best evidence on the effects of rehabilitation on intellectually disabled people.

1.6 THE PURPOSE OF THIS STUDY

The purpose of this study was to critically synthesize the evidence of the effects of rehabilitation on intellectually disabled people by means of a systematic literature review.

1.7 PARADIGMATIC ASSUMPTIONS

The paradigmatic assumptions of this study are based on the meta-theoretical, theoretical and methodological assumptions of the researcher, which are explained in the following paragraphs to direct the researcher's perspective.

1.7.1 Meta-theoretical assumptions

As a Christian, this study's meta-theoretical assumptions are based on my beliefs, as well as on relevant literature, which include the following assumptions regarding humankind, nursing, health, illness/disease and the environment. The following meta-theoretical assumptions are defined:

1.7.1.1 Humankind

The researcher believes that humankind is created by God according to His image. Humans are spiritual beings who function in an integrated bio-psychosocial manner to achieve their quest for wholeness.

In this study, 'humankind' refers to the intellectually disabled person in a mental health institution or at a mental health community setting. This person is viewed holistically and as a human being with innate potential.

1.7.1.2 Nursing

Nursing is a goal-directed service and nursing actions facilitate the wellbeing of the individual, family and the community (Kenney, 2002:120).

In this study, ‘nursing’ refers to holistic, rational, spiritual and ethical caring through the rehabilitation of intellectually disabled people to improve their functional capabilities and activities of daily living (ADL) and to strive towards excellence in complex community, organisational and bureaucratic cultures.

1.7.1.3 Health

Health is a state of complete physical, mental, social and spiritual wellbeing of the whole person and not merely the absence of disease or infirmity (Basavanthappa, 2008:18-19).

In this study, health is related to the promotion of wellbeing and the prevention of dependency through the effective rehabilitation of people with intellectual disabilities.

1.7.1.4 Illness/disease

Illness refers to impairment of health. Illness is a dynamic state indicating a person interacting with the environment. It is described as ranging from severe to minimum illness and the potential to be healthy. Illness is a personal state in which the person feels unhealthy or ill. Illness may or may not be related to disease. Parsons (cited in Basavanthappa, 2008:12) defines illness as “a state of disturbance in the normal functioning of the total human individual, including both the state of the organism as biological system, and his person and social adjustments”. In contrast to illness, disease is described as an alteration in the bodily functions (congenital, degenerative or idiopathic), which may result in a reduction of capacities or shortening of the normal lifespan (Basavanthappa, 2008:12).

In this study, illness refers to intellectually disability with skills deficits.

1.7.1.5 Environment

The environment includes both the physical environment and the people who inhabit that world. Humans have learned to control many aspects of their physical environment to make it more conducive to healthy living. The environment can be classified as internal and external. The internal environment consists of body, mind and spirit and the

harmonious functioning within the body system. The external environment (macro environment) consists of things the individual is exposed to from birth, such as physical, biological, social (family or group), community, spiritual and psychological (lifestyle or ways of living) dimensions (Basavanthappa, 2008:37).

This study focused on the internal and the external environment of intellectually disabled people because the two are related and a defect in the external environment leads to a health problem in the internal environment involving the body, mind and spirit. The impact may be as a result of congenital abnormalities or enduring severe infection pre- and post-natal. The intellectually disabled person's external environment includes both mental health care institutions and the community setting, where intellectually disabled people are involved in rehabilitation training, and in this study, 'environment' refers to both these settings (Basavanthappa, 2008:38).

1.7.2 Theoretical assumptions

Theoretical assumptions are epistemic and testable; they direct the central theoretical assumption and the conceptualisation of the key concepts of research (Botes, 1995:9). The theoretical assumptions of the study included the central theoretical assumption as well as the theoretical definitions of key concepts applicable to this study.

1.7.2.1 Central theoretical assumption

The purpose of description and exploration (critical synthesis) by means of a systematic literature review of the effects of rehabilitation on intellectually disabled people will contribute to better understanding of this phenomenon. A better understanding will increase the knowledge base of nursing and this will lead to better care of the intellectually disabled people.

1.7.2.2 Theoretical definitions

The following definitions outline the key concepts applicable to this study:

1.7.2.2.1 Effects

The term 'effect' is defined as the result of a cause or action by some agent; the power to produce an outcome or achieve a result or an influence (American Heritage & Stedman's Medical Dictionary, 2002). In this study, effects are viewed as change, results or outcomes of interventions – in this context, the outcome will be an intellectually disabled person who can independently utilise his/her maximum functional capabilities.

1.7.2.2.2 Intellectually disabled person

'Intellectually disabled person' refers to a person with significant sub-average intellectual functioning associated with concurrent impairments in adaptive behaviour manifested during the developmental period with the onset before the age of 18 (Uys & Middleton, 2004:490). Types of intellectual disability are as follows (Uys & Middleton, 2004:491-492):

- Mild intellectual disability: Intelligence quotient (IQ) of 50-55 to 70. These individuals can master academic skills.
- Moderate intellectual disability: IQ of 35-40 to approximately 50-55. These individuals can also profit from training in social and occupational therapeutic skills. They can be trained in training centres.
- Severe intellectual disability: IQ of 20–25 to 35-40. These individuals can only be trained in elementary skills and systematic habits in stimulation centres.
- Profound intellectual disability: IQ below 20 or 25. Such individuals are seen as untrainable and may only respond to minimal or limited training in self-care.

In this study, intellectual disabled person are those people whose intellectual functioning is sub-average before the age of 18 and have to undergo skills training through involvement in a rehabilitation programme. The study focused on mild and moderate intellectual disabled people because they are trainable and can benefit from rehabilitation.

1.7.2.2.3 Rehabilitation

Rehabilitation refers to a goal-oriented and time-limited process aimed at enabling impaired people to reach an optimum mental, physical and/or social functional level, thus providing them with the tools to change their own life and to attain independence and self-determination. It can involve measures intended to compensate for a loss of function or a functional limitation and other measures intended to facilitate social adjustment (National Rehabilitation Policy Document, South Africa, 2000:31). In this study, rehabilitation is viewed as a process aimed at enabling intellectually disabled people to reach and maintain the optimum sensory, intellectual, psychological and social functioning levels. Rehabilitation provides intellectually disabled people with the tools they need to attain independence and self-determination; therefore, the researcher examined data from different studies for the purpose of this study.

1.7.3 Methodological assumptions

Methodological assumptions reflect the researcher's view of the nature and structure of nursing research (Botes, 2005:9). The methodological assumptions of this research guided the researcher to systematically select, appraise, extract and summarise available evidence and to establish a critical synthesis of the available scientific evidence of the effects of rehabilitation on intellectually disabled people. The aim of this study was to determine the effects of rehabilitation on intellectually disabled people; therefore, data from different studies were used to gather scientific evidence of the effects of rehabilitation on intellectually disabled people.

The Botes model (Botes, 2005:6-7) presents and arranges nursing activities in three levels:

- The first level is the practice of nursing, with the aim of promoting the health of patients. Nursing practice is the research domain for nursing. In this study, this level refers to the rehabilitation of intellectually disabled people.
- The second level represents the research methodology and nursing science, which entail the enhancement of the scientific body of knowledge. The

researcher is continuously in interaction with the practice situation and therefore operates on the second level and thus in interaction with the practice situation of investigating and exploring the effects of the rehabilitation of intellectually disabled people in order to come up with scientific evidence in this regard, which refers to the systematic review in this study.

- The third level represents the paradigmatic perspective of nursing. This includes convictions or beliefs that may be meta-theoretical (ontological, epistemological and methodological) in nature. The researcher used certain assumptions from the paradigmatic perspective for this study. These assumptions as stated served as determinants for the research decisions. This study's meta-theoretical assumptions were based on the researcher's beliefs (refer to 1.7.1).

1.8 RESEARCH METHOD

The research method followed in this study was a systematic literature review that focused on and provided broad scientific evidence of the effects of rehabilitation on intellectually disabled people. The systematic literature review is the application of scientific strategies in ways that limit bias and assemble a critical appraisal and synthesis of all relevant studies that address a specific clinical question. Systematic reviews therefore aim at balanced summaries of published and unpublished literature in a specific issue with the benefit of presenting evidence emanating from a large body of knowledge (Badr, 2007:79).

The steps of the systematic review as well as relevant guidelines are tabulated in Table 1.1.

Table 1.1: Steps of the systematic review relevant to this study (as adapted from American Dietetic Association (ADA), 2009:4)

Step	Action
1	Formulate a review question in PICOT (Patient/population, Intervention, Comparison, Outcome and Time) format
2	Generate a search strategy (Sampling procedure): • be comprehensive • beware of publication bias • set inclusion and exclusion criteria • set timeframe of studies to be used • decide on databases • decide on grey literature • select language • identify keywords for search • contact the librarian for assistance when needed
3	Conduct the search: • perform the initial screening process – reading the titles and abstracts for relevance • keep an accurate record of all identified studies and the screening process for audit purposes • perform a manual search of key studies – ensure a thorough search
4	Critically appraise the relevant studies: • assess methodological quality and validity • give written motivation for all decisions for inclusion and exclusion
5	Extract data and summarise all relevant studies that comply with the selection criteria and that were found to be of good quality: • data reduction • data display Critically synthesise the findings of the selected studies: • data comparison • conclusion • verification

The tabulated steps of the systematic review are discussed in detail in Chapter 2.

1.9 RIGOUR

Rigour is explained as striving for excellence in research through the use of discipline, scrupulous adherence to detail and ensuring strict accuracy (Burns & Grove, 2005:750).Table 1.2 depicts the strategies used to enhance rigour in this study.

Table 1.2: Strategies to enhance rigour

STEPS	RIGOUR STRATEGY	STUDY APPLICATION
Problem identification	Clear identification of the problem that the review intends to answer and the review purpose is important to determine the variables of interest and the sample frame (Whittemore & Knafl, 2005:548). The question should be specific to focus the search for applicable research. It should also be sufficient and not limit the scope of the literature search (ADA, 2009:16).	The review question was formulated based on the PICOT format (ADA, 2009:16).
Literature search	A well-defined literature search strategy is critical for a systematic review to provide an adequate comprehensive database that ensures accurate results and enhances rigour of the study by limiting publication bias and ensuring adequate results at the end. The search must seek to cover all the literature from different databases and to also include non-English sources. The literature search process must be clearly documented in the method section, including search terms. Inclusion and exclusion criteria should be determined for the primary source to enhance rigour (Hemingway & Breton, 2009:4; Whittemore & Knafl, 2005:548).	The researcher conducted a formal search to collect evidence to answer the review question. Studies were selected from a maximum number of eligible primary sources by using computerised databases. The researcher avoided limitations associated with inconsistent search terminology. The researcher used a well-defined literature search strategy and both electronic and grey literature were searched (internet: Google scholar and other databases).

STEPS	RIGOUR STRATEGY	STUDY APPLICATION
Critical appraisal	Studies should be assessed for methodological quality, using a critical appraisal framework such as the standardised checklist from the Critical Appraisal Skills Programme (CASP) to assess the quality of the systematic review. Poor-quality studies should be excluded, but still discussed in the review report (Hemingway & Breton, 2009:4-5).	The researcher used an appraisal strategy according to the steps of the systematic review, which include the following: • Set inclusion and exclusion criteria • Standardised CASP instruments to enhance reliability and validity during appraisal (refer to appendices A, B and C). • Assessment also conducted by a second reviewer to enhance reliability and validity during appraisal. Personal meetings to discuss results were arranged when conflicting results arose to reach consensus. • Creation of a list of included studies
Data extraction	Data extraction – selecting relevant data from selected studies to answer research question.	The researcher used a data-extraction strategy according to the steps of a systematic literature review, which included the following: • Data-extraction based on author, reference, country, focus, question, design sample, method and findings to answer research question. • Data reduction or summary of findings of the individual studies to answer the review question. • Exclusion of some studies based on foreign language and studies not relevant to the review question. • Reporting findings that were extracted in a data-extraction form. • Data display, which involves converting the extracted data from individual primary studies into a display that assembles the data from multiple primary studies on particular variables. The format of the data display can be matrices, graphs, spreadsheets or charts (Whittemore & Knafl, 2005:550).
Data synthesis	Extracted data should be compared item by item, similar data should be categorised and grouped together and thereafter the coded categories are compared, analysed and synthesised (Whittemore &	The researcher used a data-synthesis strategy according to the steps of the systematic review. Critical synthesis of the individual findings of the primary studies towards a conclusion entailed data comparison, conclusion

STEPS	RIGOUR STRATEGY	STUDY APPLICATION
	Knafl, 2005:550). The drawing of conclusions and verification is the final stage. Data synthesis requires honesty, transparency and a thorough reflection and exploration from the researcher, which should be verified through continuous recordkeeping during the whole process to enhance rigorous methodology (Whittemore & Knafl, 2005:551).	drawing and verification. Data comparison was a repetitive process of examining the data display to identify patterns, themes and relationships of the variables (thematic analysis).

1.10 ETHICAL CONSIDERATIONS

The researcher examined different studies that are of high quality. For this study, the researcher used and agreed with the prescribed principles laid down in the North-West University manual for postgraduate studies (North-West University, 2010:64). The researcher thus conducted the research in an ethical manner by:

- obtaining permission to conduct the study from Postgraduate Research Committee of the School of Nursing Science at the Potchefstroom campus of North-West University;
- planning the research accordingly to avoid a waste of time and effort;
- adhering to ethical principles of honesty, protecting the integrity of scientific knowledge and ensuring accuracy in reporting the studies reviewed and keeping a detailed record of review and appraisal for audit purposes;
- showing respect for copyrights where and when applicable by quoting applicable reference in the text, at illustrations, diagrams or with statistical graphics. Every resource that were used were referenced in the bibliography of the study.
- assurance of the data drawn from the internet for reliability and validity by punctual documentation, pre-selected search terms, use of approved databases and pre-determined inclusion and exclusion criteria.
- gathering or collecting data from sound scientific data sources that are traceable and relevant for audit purposes by keeping a well-documented record of all database search results as well as inclusion and exclusion criteria of articles;
- avoiding selection bias by using independent reviewer; and
- following the fundamental ethical principles of respect for the information sources and databases. (Brink, 2006:40-41).

Furthermore, the study was supervised by two senior lecturers who are both experienced in conducting systematic reviews from the School of Nursing Science, Potchefstroom campus, North-West University.

1.11 CHAPTER DIVISION

The chapters in this mini-dissertation are presented as follows:

Chapter 1: Overview of the study
Chapter 2: Research methodology
Chapter 3: Realisation and findings of the research
Chapter 4: Findings of the study and summarising evidence
Chapter 5: Conclusions, limitations and recommendations

1.12 SUMMARY

In this chapter, the reason for the current research was discussed. This chapter introduced the background and the problem statement of the research project in order to substantiate the research project. Framed against the background, the research question was raised and the research aim in response to the question was put forth. The main paradigmatic perspective and its assumptions were described and the research method was explained. Rigour and ethical considerations were also discussed.

Chapter 1 has demonstrated that a comprehensive systematic review of literature and a critical systematic synthesis of high quality will be of benefit to nurses and other health care professionals to understand the effects of rehabilitation on intellectually disabled people. The research methodology is discussed in detail in chapter 2.

CHAPTER 2

RESEARCH METHOD

2.1 INTRODUCTION

The research method followed in this study was a systematic literature review that focused on and provided broad scientific evidence of the effects of rehabilitation on intellectually disabled people. A systematic literature review is the application of scientific strategies in ways that limit bias and assemble a critical appraisal and synthesis of all relevant studies that address a specific clinical question. Systematic reviews therefore aim at a balanced summary of published and unpublished literature in a specific issue with the benefit of presenting evidence emanating from a large body of knowledge (Badr, 2007:79).

In this chapter, the research method, namely the systematic review and its steps, is discussed in detail.

2.2 STEPS OF THE SYSTEMATIC REVIEW

The steps of the systematic review relevant to this study are outlined in Table 2.1.

Table 2.1: Steps of the systematic review relevant to this study (as adapted from ADA, 2009:4)

Step	Action
1	Formulate a review question in PICOT (Patient/population, Intervention, Comparison, Outcome and Time) format
2	Generate a search strategy (Sample population): • be comprehensive • beware of publication bias • set inclusion and exclusion criteria • set timeframe of studies to be used • decide on databases • decide on grey literature • select language • identify keywords for search • contact the librarian for assistance when needed
3	Conduct the search: • perform the initial screening process – reading the titles and abstracts for relevance • keep an accurate record of all identified studies and the screening process for audit purposes • perform a manual search of key studies – ensure a thorough search
4	Critically appraise the relevant studies: • assess methodological quality and validity • give written motivation for all decisions for inclusion and exclusion
5	Extract data and summarise all relevant studies that comply with the selection criteria and that were found to be of good quality: • data reduction • data display Critically synthesise the findings of the selected studies: • data comparison • conclusion • verification

In the following section, the tabulated steps of the systematic review are discussed in relation to this study.

2.2.1 Step 1: Formulate a review question

The first stage of the systematic review method started with a clear identification of the problem that the review has to answer and the review purpose (Whittemore & Knafl, 2005:548). The review question should give a clear identification of the purpose of the review to determine the variables of interest and the sample frame. The review question should address the following elements or components to enhance clarity and rigour: Patient/population, Intervention, Comparison (if applicable), Outcome and Time (if applicable) of the study (Whittemore & Knafl, 2005:548). These five elements are referred to as the PICOT format. The question should be specific to focus the search for applicable research. It should also be broad enough and not limit the scope of the literature search (ADA, 2009:16).

The review question for this research was as follows:

What is the available evidence of the effects of rehabilitation on intellectually disabled people?

The PICOT format used is outlined in Table 2.2.

Table 2.2: Review question in PICOT format

PICOT	
Population	Intellectually disabled people
Intervention	Rehabilitation
Comparisons	No comparison
Outcome	Positive client outcomes, which include improved functional skills levels, adaptation to recovery from disability, maximised functional independence, marked by growth towards autonomy and achieving a full, rich and fulfilling life.
Time	Not applicable.

2.2.2 Step 2: Generate a search strategy

This step includes the strategy that was used to search the primary studies of published and unpublished literature on all work on the topic of interest, including search terms / keywords. A well-defined literature search strategy is critical for the systematic review to provide an adequate comprehensive database that ensures accurate results and enhances rigour of the study by limiting publication bias (Whittemore & Knafl, 2005:548). An exhaustive literature search ensures that all the relevant studies are included in the review; it is therefore ideal that all the reviewed literature on the topic of interest be included in the review (Evans & Pearson, 2001:112). Therefore, the databases that were freely available that covers the field of rehabilitation and formal published research studies were selected purposively and searched on the basis of appropriateness and accessibility. A record of search was kept for audit purposes.

Literature searches of different electronic databases as well as manual searches of references to primary studies were conducted using selected keywords. A comprehensive search during the systematic review is essential to identify the maximal number of eligible primary sources (Whittemore & Knafl, 2005:548). Databases that were searched are displayed in Table 2.3.

Table 2.3: Databases for formal search

Databases	Completed and current research
ProQuest	International theses and dissertations
EBSCOhost Platform: - Academic Search Premier - Source: Nursing/Academic - File Premia - CINAHL with full text - Healthsource Consumer Edition - Healthsource: Nursing/Academic Edition - MEDLINE (nursing and allied professions) - Africa-Wide: NiPAD - PsycINFO	International journals on health science – primary studies Scholarly articles in behavioural sciences in mental health
Science Direct	International journals on health science – primary studies
Cochrane Library	International systematic reviews and clinical trials in health science
Nexus (NRF)	Current and completed research projects in South Africa
Sabinet Online: ISAP SAe Publication	South African journals and publications – primary studies Full text SA Journals
Google scholar	Scholarly literature
Manual search: - References of primary studies	 All references

A systematic search of the literature was done on publications dating from January 2000 to December 2010 to identify studies that examine the effects of rehabilitation on intellectually disabled people.

2.2.2.1 The study selection criteria and procedures

Study selection criteria determine the criteria for including or excluding the study from the systematic review. The literature search of the current systematic review was clearly documented and inclusion and exclusion criteria were also clearly stated for determining all relevant primary resources, as outlined in Table 2.4.

Table 2.4: Inclusion and exclusion criteria with rationale for this study

Inclusion criteria	Exclusion criteria	Rationale
Population: Intellectually disabled adults and children who are mildly and moderately disabled (trainable)	Intellectually disabled people who are severely retarded	To direct the review question and focus on the study population and also because intellectually disabled people who are severely retarded have a very low intelligent quotient and are thus not trainable
Setting: Institutional and community care setting	Vocational/work setting	To give focus to the setting
The condition of participants: Individuals who are diagnosed with intellectual disabilities	Those diagnosed with acute mental illness, other general medical conditions/physical ailment, trauma and spinal injuries and neurological deficits	To focus on the study population
Study design: Design of primary studies: Randomised control trials (RCT) Single-case design Cohort design Qualitative research	Published books without scientific evidence	To identify available recent research to address and/or answer the review question
Timeframe: From January 2000 to December 2010	Prior to 2000	To include only recent research studies
Language preference: May include articles in other languages with English abstracts	Primary studies in foreign languages – non-English abstracts	To be able to understand research studies to answer the review question
Intervention: Rehabilitation training as an intervention	Other types of interventions, such as formal classroom training and lecturing	To ensure appropriate evidence and focus

2.2.2.2 Inclusion criteria

The inclusion criterion for this study is:

- Research studies such as systematic reviews
- Published journal articles on primary studies
- Published theses and dissertations
- Grey literature – unpublished theses and dissertations
- Written in English or translations thereof, including well-written English abstracts of any eligible primary study
- Relevant primary research studies from 2000 to 2010

2.2.2.3 Exclusion criteria

The exclusion criterion is:

- Primary studies in foreign languages without English abstracts
- Conference abstracts
- Primary studies before 2000
- Primary studies after 2010
- Consumer/newspaper articles

2.2.2.4 The keywords

The keywords 'effects', 'intellectually disabled person' and 'rehabilitation' were used in the formal search and combinations thereof where applicable. These search words were used to identify relevant pieces of research (ADA, 2009:16).

2.2.3 Step 3: Conduct the search

Conducting the formal search to collect evidence to answer the review question was the next step. The researcher firstly started by consulting the librarian regarding databases and keywords, thereafter the initial search was conducted. The most effective and

efficient way for selecting studies is by using computerised databases and avoiding limitations associated with inconsistent search terminology. In general, a comprehensive search strategy that identifies the maximum number of eligible primary sources and uses at least two to three strategies is essential during a systematic review (Whittemore & Knafl, 2005:548).

To ensure that only studies addressing the specific topic of interest were included in the review, criteria for eligibility were used. These criteria were based on scientific reasoning and were documented before commencement of the review, as recommended by Evans and Pearson (2001:113). Screening of all titles and abstracts of identified studies for relevance to the review question and also against the inclusion criteria was done. For any uncertainties noted about the relevance, retrieval of the complete original article was done to thoroughly examine its relevance. An accurate record of all identified studies and the screening process for inclusion and exclusion of studies was kept for audit purposes. A record of all decisions made on inclusion and exclusion of studies was kept. A second reviewer independently reviewed the identified studies of the search to limit selection bias. A manual search of selected and full-text studies was performed on all the references of selected studies to ensure a thorough search and to prevent publication bias. An additional search was conducted after the formal search using the Google search engine to identify any missed eligible studies.

2.2.4 Step 4: Critically appraise relevant studies

In the systematic review, the sampling frame included all eligible studies. Critical appraisal of the selected studies for methodological quality and validity increases the complexity yet enhances rigour of the systematic literature review. There is no golden standard for evaluating and interpreting the quality of primary sources in research studies. Therefore, quality evaluation for systematic literature reviews varies and depends on the sample frame (Whittemore & Knafl, 2005:549).

In this study, all relevant studies were appraised in terms of methodology and quality using the standardised checklists from the (CASP, 2006). A record of all the appraised studies, instruments that have been used for appraisal, appraisal outcomes and

motivation for decisions on inclusion and exclusion was kept for audit purposes. A second reviewer was asked to independently appraise the selected studies for methodological quality and inclusion in or exclusion from the systematic literature review. Any conflict that occurred during appraisal was resolved by personal discussion between the researcher and the independent reviewer. After critical appraisal was conducted, a final list with relevant and rigorous studies was compiled. These studies were used for the next step: data extraction.

2.2.5 Step 5: Extract data and summarise all relevant studies that comply with the selection criteria

Data extraction of the relevant, selected and included studies was done according to data reduction and data display. Data reduction involves the determination of an overall classification system or sub grouping to manage data generated through diverse methodologies. In the systematic literature review, the data can be classified in subgroups based on type of evidence, study design, chronology, settings, sample characteristics or a predetermined conceptual classification such as participants' experience, attitude or behaviours (Whittemore & Knafl, 2005:550). In this study, all the relevant primary studies included for review were classified according to study design and type of evidence.

Data reduction also includes techniques of extracting and coding the data from primary studies to simplify, abstract, focus and organise data into a manageable framework to compare issues, variables, sample characteristics and findings of the individual studies relevant to the review question. Data display involves converting the extracted data from individual primary studies into a display that assembles the data from multiple primary studies on particular variables. The format of the data display can be matrices, graphs, spreadsheets or charts (Whittemore & Knafl, 2005:550). The extracted data of this systematic review were coded to compare themes and variables that will be displayed in table format**.** This is a formalised process of collecting study characteristics. In addition, reporting of the characteristics of studies was an important component of the final

review report and also represents part of the reviews data trail claimed to be important for primary research (Evans & Pearson, 2001:114-115).

Critical synthesis of the individual findings of the primary studies towards a conclusion entails data comparison, conclusion drawing and verification. Data comparison is a repetitive process of examining the data display to identify patterns, themes and relationships of the variables. The drawing of conclusions and the verification thereof are on a higher level of abstraction than data comparison. Conclusions entail subsuming the particulars into the general and developing a conceptual model that is continually revised in order to be inclusive of as much data as possible. Data synthesis requires honesty and transparency, and a thorough reflection and exploration from the researcher were verified through continuous recordkeeping during the whole process to enhance rigorous methodology (Whittemore & Knafl, 2005:551).

Verification with primary studies in terms of discernment of identified patterns, themes and relationships described in the final conclusion is required to enhance accuracy and confirmability. Addressing conflicting evidence is a considerable challenge and should be dealt with either by voting, comparing the frequency of significant positive findings against significant negative findings, exploration of confounding variables or motivation for the need of further research (Whittemore & Knafl, 2005:551). In this study, conflicting evidence was addressed by including the outcomes of rigorous and relevant studies in the conclusion statements, whether the studies contained conflicting evidence or not.

2.3 SUMMARY

In this chapter, the research method was explained in detail. Chapter 2 demonstrated the steps of a systematic review. In chapter 3 the realisation and findings of the research are discussed.

CHAPTER 3

REALISATION AND FINDINGS OF THE RESEARCH

3.1 INTRODUCTION

Chapter 3 includes an in-depth systematic literature review followed by a critical synthesis of the findings of the selected studies. In this chapter, the overview of the systematic review is given according to four of the five specific steps of the systematic review, namely Step 1: Formulate a review question; Step 2: Identifying relevant studies for inclusion (sampling procedure); Step 3: Conduct the search and performing the critical appraisal; Step 4: Involves the critical appraisal of relevant studies and Realisation of Step 5, extracting of data and summarising all relevant studies are discussed in the next chapter.

All primary studies and reviews of primary studies on the effects of rehabilitation on intellectually disabled people within the time frame of January 2000 to December 2010 were selected and the researcher ensured that recent research of high quality was identified to answer the review question. Relevant studies were identified for inclusion (sampling procedure) and irrelevant studies were excluded. The language of studies selected was any language with English abstracts, to limit publication bias. The combination of databases was selected on the basis of appropriateness and accessibility. Keywords such as rehabilitation, effects, intellectually disabled people, mentally retarded, results and outcome and combinations thereof were used in the formal search, where applicable. These search words were used to identify relevant pieces of research (ADA, 2009:16).

3.2 STEP 1: FORMULATE A REVIEW QUESTION

The first step of the systematic review method starts with clear identification of the review question. This review question was approved and refined with the assistance of

the study supervisors. The research question was stated as follows: "What are the effects of rehabilitation on intellectually disabled people?"

The review question was formulated in a PICOT format (Whittemore & Knafl, 2005:548).

The components (according to PICOT) of the research question are outlined in Table 3.1.

Table 3.1: Components of the research question

PICOT format:	
Population	Mild and moderate Intellectually disabled people
Intervention	Rehabilitation
Comparisons	No comparison
Outcome	Positive client outcomes, which include improved functional skills levels, adaptation to recovery from disability, maximised functional independence with the least amount of ongoing professional assistance and maintained bio-psychosocial status for community-based living, marked by growth towards autonomy and achieving a full, rich and fulfilling life.
Time	Not applicable.

3.3 STEP 2: IDENTIFYING RELEVANT STUDIES FOR INCLUSION (SAMPLING PROCEDURE)

Literature searches of different electronic databases as well as manual searches were done using selected keywords to ensure accurate results (Whittemore & Knafl, 2005:548). An exhaustive literature search ensures that all the relevant studies are included in the review (Evans & Pearson, 2001:112). The inclusion and exclusion criteria were also clearly stated for determining all relevant primary resources and a record of the search was kept for audit purposes

3.3.1 Inclusion and exclusion criteria

The sample included all the studies that met the following criteria:

- Research studies related to effects, effectiveness, result and outcomes of rehabilitation on intellectually disabled people
- Primary studies in English and Afrikaans, because these are languages the researcher is conversant with
- Studies published from 2000 to 2010

The sample excluded studies that met the following criteria:

- Primary studies in foreign languages without English abstracts
- Irrelevant studies, such as studies of
    - people with learning disabilities;
    - other psychiatric, medical and traumatic conditions; and
    - vocational rehabilitation
- Conference abstracts;
- Primary studies before 2000
- Primary studies after 2010
- Books, consumer/newspaper articles
- Non-research reports and duplicate studies

This systematic literature search was done with the aim to include all studies and to provide an adequate comprehensive database that ensures accurate results and enhances rigour of the study (Whittemore & Knafl, 2005:548). Therefore, an exhaustive literature search will ensure that all the relevant studies are included (sensitivity) in the review (Evans & Pearson, 2001:112). The databases that are freely available that covers the field of rehabilitation and formal published research studies were therefore selected purposively and searched on the basis of appropriateness and accessibility.

Thereafter, filtering was done to ensure that all studies included were relevant (specificity).

3.3.2 Sources

To identify relevant studies, multiple sources, in other words different databases, were searched, as outlined in Table 3.2.

Table 3.2: Sources used in the search strategy

Electronic databases		**Type of literature included**
International	Science Direct	Journal articles
	EBSCOhost: Academic Search Premia, CINAHL, Healthsource: Nursing/Academic edition, Master File Premier, MEDLINE, PsychInfo and Africa-Wide NiPAD	Journal articles
	ProQuest	Theses and dissertations
	Cochrane	Systematic reviews of studies
National	Nexus (NRF) In order to obtain all relevant research studies, the librarian was consulted due to the fact that Nexus is a complicated database, literature included is current and completed research projects in South Africa	
	Sabinet Online (including ISAP)	
Studies not published in journals		
Manual search	Searched for grey literature such as conference proceedings, reports booklets and unpublished research theses. Manual search was done to obtain articles from the internet and to scan through references.	

3.3.3 Keywords

A broad combination of keywords was used to search the literature on the topic researched. The following combination of search words was used in the formal search to identify relevant pieces of research: effects, rehabilitation and intellectually disabled person. The following combination was also used: (rehab* or intervention) and (mental* or intellectual*) and (ill* or disabled* or retarded or handicapped*) and (outcome* or results* or effect* or impact).

Keywords were searched in the categories of “All” or “Title”, “Abstract” or “Keywords”. This was done to prevent missing relevant available data. As some databases did not yield relevant results with some keywords, the researcher had to use only selected keywords to obtain relevant results. The databases with keywords are outlined in Table 3.3.

Table 3.3: Databases with keyword combinations used in the search

Databases	Subdivisions	Keywords used	Number of articles
ProQuest	International theses and dissertations	• (rehab* or intervention) and (mental* or intellectual*) and (ill* or disabled or retarded or handicapped*) and (outcome* or results* or effect* or impact)	89
EBSCOhost Platform	International journals on health science – primary studies: - Academic Search Premier - Healthsource: Nursing/ Academic - Master File Premier - CINAHL - CINAHL with full text - Healthsource: Consumer edition - Healthsource: Nursing/Academic edition - MEDLINE (nursing and allied professions) - Africa-Wide: NiPAD - PsychInfo	• (rehab* or intervention) and (intellectual* or mental*) and (disabled or retarded or handicapped) and (outcome* or results* or effect* or impact)	299
Science Direct	International journals on health science – primary studies: Health sciences Social sciences and humanities	• rehabilitation and (intellect*) and (disabled or retarded* or handicapped*) and (outcome* or results* or effect*) and (function or self-efficacy or self-determination) The following combination was also used: • (rehab* or intervention) and (intellectual* or mental*) and (disabled or retarded or handicapped) and (outcome* or results* or effect* or impact)	386

Databases	Subdivisions	Keywords used	Number of articles
Cochrane Library	International systematic reviews and clinical trials in health science: CDSR (Cochrane Database Systematic Reviews) CCRT (Cochrane Central Register of Control Trials) DARE (Database of Abstracts of Reviews of Effects)	• (rehab* or intervention) and (mental* or intellectual*) and (disabled or retarded or handicapped*) and (outcome* or results* or effect* or impact) The following combination was also used: • rehabilitation and (mental* or psychiatr* or intellect* or handicap* or disabled or retarded*) and (effect* or outcome* or results*)	130
SA Nexus (NRF)	Completed and current research in South Africa	• (Mental* or intellect*) and (ill* or disabled* or retarded or handicapped*) and (outcome* or effects* or result*) and (intervention or and rehab*)	22
Sabinet Online: ISAP	South African journals and publications – primary studies	• Rehabilitation and (mental* or psychiatr* or intellect* or handicap* or disable* or retarded) and (effects* or outcome* or results*)	6
- Google (Advanced Scholar Search)	Medicine	• Rehabilitation and (intellectual) and (disabled or retard* or handicap* or ill*) and (outcome* or results* or effect* or impact)	150
Manual search - References	Manual search	Reference copies were gathered from articles retrieved	20
			Total =1 102

3.4 STEP 3: CONDUCT THE SEARCH

3.4.1 Selection of studies

The initial screening process of all titles and abstracts of identified studies was done to determine the relevance of the study to the review question in order to refine the search strategy. Studies were initially considered if they were published from 2000 to 2010 in English and contained data on the effects of rehabilitation on intellectually disabled people. Therefore, studies that appear to meet these inclusion criteria were selected and full copies were retrieved to thoroughly assess their relevance. Accurate record was kept throughout the process for audit purpose to enhance rigour as described in the manual of the Centre for Reviews and Dissemination (CRD) (2009:23).

The study review and selection were undertaken by the researcher as master student and an independent reviewer. The total number of studies identified through the electronic database search was 1 102 studies. All titles and abstracts were screened for relevance and 40 studies were immediately excluded due to obvious irrelevancy. Specific studies excluded were the following:

- Studies that was critically appraised and received a rating of 5/10 according to the CASP score and a (-) / low rating on the ADA quality rating;
- Studies focussing on health professionals and people caring for the intellectually disabled persons;
- Studies addressing training and support programmes for parents of intellectually disabled children but not the effects of rehabilitation of the intellectually disabled persons themselves;
- Studies on assessing the social impairments associated with children with severe intellectual disabilities and/or autism;
- Studies regarding vocational rehabilitation and problems in the development and delivery of vocational rehabilitation services;

- Studies focusing on psychosocial intervention on individualised psychiatric conditions;
- Studies concentrating on psychotherapeutic interventions and does not support the effects of rehabilitation on intellectually disabled people;
- Studies regarding the effect of deinstitutionalisation;
- Studies regarding the effects of goal planning in clinical rehabilitation and does not support the effects of rehabilitation on intellectually disabled people;
- Studies focusing on behavior modification and gentle teaching workshops for nurses and does not support the effects of rehabilitation on intellectually disabled people;
- Studies determining evidence supporting the evidence/research base for learning disability in nursing practice;
- Studies concentrating on the profile of and utilisation of rehabilitation services for people with intellectual disabilities;
- Studies concentrating on the conceptualisation of mental retardation and also using theoretical and empirical efforts to identify mental retardation and related disabilities.

Then from the remaining 1 062 studies, another 993 were excluded because they were not relevant to the rehabilitation of intellectually disabled people. The abstracts and titles of the remaining 69 studies were screened for the second time to include only studies that appear to reflect true relevancy regarding the effects of rehabilitation on the intellectually disabled person. Two studies were excluded due to the fact that they were duplicates. Thereafter, the full texts of the remaining 67 studies were retrieved and another 40 studies were excluded due to them being written in a foreign language. All abstracts and full texts were thoroughly reviewed for true relevancy to the review question, after which a further 20 studies were excluded. Only seven full-text articles were thus finally selected for critical appraisal because they were relevant to the effect

of rehabilitation on intellectually disabled people. The study selection for the formal review and critical appraisal is displayed in Figure 3.1.

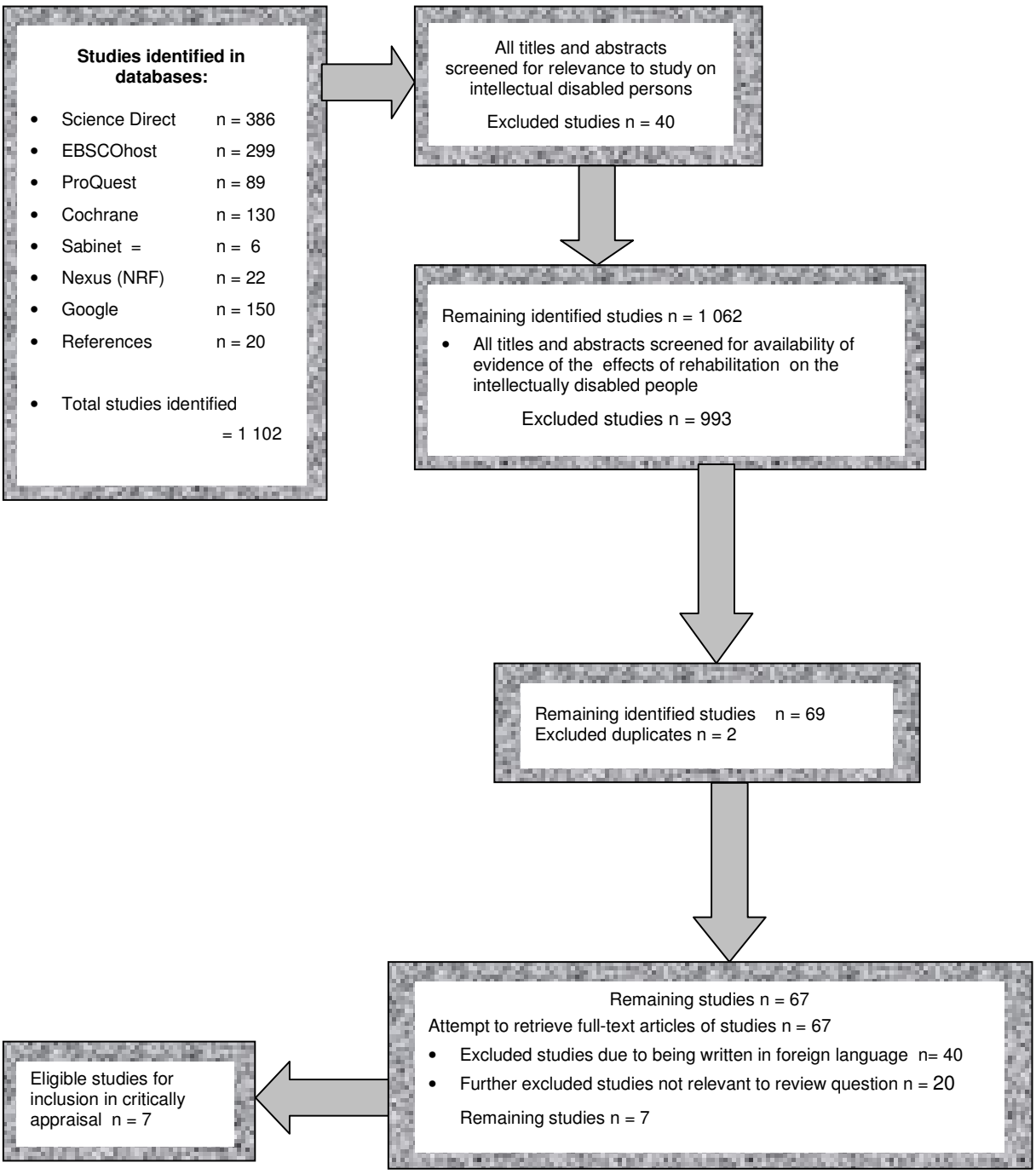

Figure 3.1: The realisation of the search strategy (sample).

The excluded articles that were written in a foreign language are outlined in Table 3.4.

Table 3.4: Excluded articles written in a foreign language

	AUTHOR	TITLE
	Science Direct database	
1	Abdelghani, A., Ben Saad, H., Ben Hassen, I., Ghannouchi, I., Ghrairi, H., Bougmiza, I., Slama, R., Tabka, Z. & Benzarti, M.	Exploration de la déficience et de l'incapacité des patients atteints d'un syndrome d'apnées hypopnées obstructives du sommeil. *Revue des Maladies Respiratoires*, 27(3), March 2010:266–274
2	Aguilaniu, B., Richard, R., Costes, F., Bart, F., Martinat, Y., Stach, B. & Denjean, A.	Méthodologie et Pratique de l'Exploration Fonctionnelle à l'eXercice (EFX). *Revue des Maladies Respiratoires*, 24(3), March 2007:114–160
3	Allet, L., Cieza, A., Bürge, E., Finger, M., Stucki, G., Monnin, D., Roth, J. & Huber, E.O.	Les catégories d'interventions CIF s'appliquant à la physiothérapie des affections musculosquelettiques. *Kinésithérapie, la Revue*, ***8***(73), January 2008:19–28
4	Alexandre, A.	Evaluation de la vitesse d'écriture d'élèves de ifférents niveaux scolaires. Original research article. *Motricité Cérébrale: Réadaptation, Neurologie du Développement*, 29(4), December 2008:143–152
5	Aubrun, F., Caillet, J.-B., Cognet, V. & Viale, J.-P.	Analgésie aiguë du grand vieillard et du centenaire: principes généraux et cas particulier de la gestion de la douleur postopératoire. *Douleurs: Evaluation - Diagnostic - Traitement*, 11(6), December 2010:271–279
6	Baldonedo, M. Lidia, S. & Deaño Deaño, M.	Procesamiento cognitivo en estudiantes con y sin deficiencia auditiva. Original research article. *Revista de Logopedia, Foniatría y Audiología*, 28(1), January-March 2008:46–57
7	Belaud, N., Cavagnac, S. & Héral, O.	La prise en charge des dysphagies dans un Foyer d'Accueil Médicalisé (F.A.M.): Aspects théoriques et pratiques à partir d'une étude de cas. Original research article. *Journal de Réadaptation Médicale: Pratique et Formation en Médicine Physique et de Réadaptation*, 25(2), December 2005:83–87
8	Ben Ammar, R.K., Miri, I., Rahali, S., Koubaa, S., Lebib, S., Ben Salah, F.Z. & Dziri, C.	Paroles d'adolescents en situation de handicap. À propos d'un groupe de parole de quatre adolescents infirmes moteurs cérébraux. *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 28(3), September 2008:110–115
9	Ben Salah Frih, Z., Boudoukhane, S., Jellad, A., Salah, S. & Rejeb, N.	Qualité de vie des parents d'enfant atteint de paralysie cérébrale. *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 30(1), March 2010:18–24
10	Bernier-François, V., Charbonnier, C., Pedelucq, P. & Tsimba, V.	Insertion sociale et professionnelle des jeunes adultes IMC. Intérêt de facteurs prédictifs dès l'enfance pour ajuster leur projet de vie. Original research article. *Motricité Cérébrale: Réadaptation, Neurologie du Développement*, 31(3), September 2010:119–128
11	De Jouvencel, M., Bek, H., Gougeon, M. & Orsoni, V.	Neuropsychologie et réadaptation. *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 30(4), December 2010:198–204
12	Devailly, J.P. & Josse, L.	Organisation et financement de la réadaptation en France. Vers un « pacs » entre cure et *care*? *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 30(4), December 2010:150–159

	AUTHOR	TITLE
13	Frattini, M.O.	La spécialité de rééducation et réadaptation fonctionnelles en France: une construction entre médecine et politique, 1945–1973. *Journal de Réadaptation Médicale : Pratique et Formation en Médecine Physique et de Réadaptation*, 30(4), December 2010:177–183
14	Genton, L., Majno, P., Raguso, C., Hans, D.B. & Pichard, C.	Intégration de evaluation nutritionnelle à lexamen médicallors de ladmission à lhôpitalIntegration of nutritional assessment at hospital admission. *Réanimation*, 11(6), September 2002:392–405
15	Héral, O.	Contribution à l'histoire de l'orthophonie en France: Jean-Marc Gaspard Itard (1774–1838), médecin et rééducateur. *Journal de Réadaptation Médicale: Pratique et Formation en Médicine Physique et de Réadaptation*, 25(4), December 2005:190–196
16	Jeannin, L.	Bronchopneumopathies obstructives chroniques du sujet âgé. *Revue des Maladies Respiratoires*, 21(5), November 2004:126–136
17	Khomiakoff, R., Czternatsy, G. & Vandromme, L.	L'acceptation des aides techniques robotisées par la personne en situation de handicap moteur: une approche psychologique. *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 29(2), June 2009:51–58
18	Lakhdar, N., Bensalah, F.Z., Miri, I., Lebib, S., Dziri, C. & Chouaib, R.	La trisomie 21: préparation à l'insertion. Original research article. *Journal de Réadaptation Médicale: Pratique et Formation en Médicine Physique et de Réadaptation*, 24(1/2), March 2004:41–45
19	Layadi, K., Belabed, A., Lahouel, F., Dali, A., Salah, R. & Bensalem, N.	Évaluation de la dépression chez les hémiplégiques vasculaires. *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 28(3), September 2008:93–96
20	Layadi, K., Meziane, M., Remaoune, M., Midoun, N. & Hamonet, C.	Évaluation du pronostic fonctionnel chez les hémiplégiques par accident vasculaire cérébral (AVC). *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 28(3), September 2008:97–101
21	Lefebvre, S., Tarall, A., Mir, R., Fleury, M., Orosan, A., Winisdoerffer, N. & Etienne, A.	Unité de rééducation neurovasculaire : étude d'efficacité, essai comparatif non randomisé. *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 31(1), March 2011:6–13
22	Le Métayer, M.	Évaluation des gnosies faciales et des gnosies linguales. *Motricité Cérébrale: Réadaptation, Neurologie du Développement*, 28 (4), December 2007:171–177
23	Martin, É.	Plasticité cérébrale et équilibration: Proposition de protocole en masso-kinésithérapie pour la prévention des chutes de la personne âgée. Original research article. *Kinésithérapie, la Revue*, 10(99), March 2010:24–29
24	Mazaux, J.M., North, P., Bilz, L., Muller, F., Belio, C. & Joseph, P.A.	Rééducation: L'approche holistique dans la prise en charge des syndromes dysexécutifs. Original research article. *Journal de Réadaptation Médicale : Pratique et Formation en Médecine Physique et de Réadaptation*, 26(1/2), June 2006:29–33
25	Melloni, B., Veale, D., Binet, F., Mounier, L., Ludot, A., Polu, J.M. & Taytard, A.	La vie quotidienne et sociale des patients insuffisants respiratoires chroniques sévères pris en charge dans le réseau ANTADIR. Original research article. *Revue des Maladies Respiratoires*, 24(5), May 2007:609–616
26	Mendoza, L.E.	La evaluación del lenguaje: orientaciones alternativas. Original research article. *Revista de Logopedia, Foniatría y Audiología*, 30(4), October–

	AUTHOR	TITLE
		December 2010:167–173
27	Miri, I., Dziri, C., Lebib, S., Ben Salah, F.Z. & Daghfous, S.	La prise en charge des mucopolysaccharidoses en milieu de Médecine Physique et Réadaptation fonctionnelle. Original research article. *Journal de Réadaptation Médicale: Pratique et Formation en Médicine Physique et de Réadaptation*, 25(4), December 2005:184–189
28	Ndao, A.K., Verschoore, P., Sakho, Y., Galien, P., Sene-Diouf, F., Ndiaye, M., Thiam, A., Diop, A.G. & Ndiaye, I.P.	La restauration fonctionnelle du rachis: facteurs prédictifs pour un bon retour au travail chez 22 lombalgiques chroniques au C.R.F. de Kerpape. Original research article. *Journal de Réadaptation Médicale: Pratique et Formation en Médicine Physique et de Réadaptation*, 24(1/2), March 2004:14–20
29	Sizun, J., Garenne, A. & Dubourg, M.	Ce que les pédiatres peuvent nous apprendre. *Réanimation*, 19(3), May 2010: 251–257
30	Vanhaudenhuyse, A., Schnakers, C., Boly, M., Perrin, F., Brédart, S. & Laureys, S.	Détecter les signes de conscience chez le patient en état de conscience minimale. *Réanimation*, 16(6), October 2007:527–532
31	Wirotius, J.-M.	La notion de fonction en rééducation: en rééducation tout est fonctionnel. Original research article. *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 24(4), December 2004:140–148
32	Wirotius, J.-M.	L'aphasie en rééducation: analyse comparée de la sémiologie diagnostique et de la sémiologie fonctionnelle. Original research article. *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 25(1), February 2005:22–31
33	Wirotius, J.M.	La survie des personnes handicapées en milieu sanitaire est de nouveau menacée: le rôle vital de la médecine physique et de réadaptation (MPR). *Journal de Réadaptation Médicale: Pratique et Formation en Médecine Physique et de Réadaptation*, 29(4), December 2009:168–174
	Google database	
34	Routh, D.K.	Historia de la teoría psicológica y de la investigación en retraso mental desde la Segunda Guerra Mundial. *International Review Research in Mental Health,* vol. 26, 2003:51-112
	EBSCOhost database	
35	Dionne, C. & Julien-Gauthier, F.	Les fondements de l'intervention en déficience intellectuelle dans les centres de réadaptation québécois.14(2), December 2003:93-119
36	Häßler, F., Buchmann, J. & Bohne, S.	Möglichkeiten und Grenzen der Behandlung aggressiven Verhaltens bei Menschen mit geistiger Behinderung mit Risperidon. *Der Nervenarzt*, 73(3), 2002:278–282
37	Lauth, G.W. & Weiß, S.R.	Modifikation von selbstverletzend-destruktivem Verhalten. Eine einzelfallanalytische Interventionsstudie bei einem Jungen einer Schule für geistig Behinderte. Praxis der Kinderpsychologie und Kinderpsychiatrie, 52 (1), 2003:109-121
38	Marinho, Susana Cristina Moreira.	Distúrbios emocionais e de comportamento em crianças e adolescentes com deficiência mental. = Emotional and behavior disorders in mentally retarded children and adolescents. Psicologia: Teoria, Investigação e Prática, Vol 6(1), 2001: 59-78.

	AUTHOR	TITLE
39	Park, H.S., Bae, S.W. & Kim, Y.Y.	The effects of psychosocial rehabilitation programs on the levels of self-efficacy for mentally disabled People. (Detail only available in Korean language; includes abstract). *Journal of Korean Academy of Nursing,* 38(5), 2008:704–711
40	Zihinsel ve Fiziksel	Engelli Çocuğa Sahip Anne ve Babaların Yaşam Doyumu ve Umutsuzluk Düzeylerinin İncelenmesi. *Selcuk University Social Sciences Institute Journal*, 22, 2009:23–32

The further excluded articles after review, including the reason for exclusion, are outlined in Table 3.5.

Table 3.5: Excluded articles, with exclusion rationale

	AUTHOR AND JOURNAL	TITLE	DESIGN	EXCLUSION RATIONALE
1	Barlow, J.H., Powel, L.A., Gilchrist, M. & Fotiadow, M. *Journal of Psychometric Research*, 64(1)2007:55-62 Country: UK	The effectiveness of training and support programmes for children with disabilities: A randomised controlled trial	Randomised controlled trial (RCT)	The study does not support the effectiveness of rehabilitation of intellectually disabled people. This study deals with training and support programmes and their effectiveness for the parents of children with disabilities to equip them with a simple massage skill to enhance their self-efficiency to meet the intellectually disabled children's needs and to reduce parental stress.
2	Beatle-Brown, J., Murphy, G., Wing, L., Gould, J., Shar, A. & Holmes, N. *Journal of Autism and Developmental Disorders,* 32(3), 2002:195–206 Country: UK	Changes in social impairment for people with intellectual disabilities: A follow-up of the Camberwell Cohort	Cohort study	Assessed the social impairments associated with children with severe intellectual disabilities and/or autism. This study does not support the effects of rehabilitation on intellectually disabled people.
3	Copeland, S.R. & Hughes, C. *Education and Training in Mental Retardation and Developmental Disabilities*, 37(1), 2002:40–45 Country: Mexico	Effects of goal setting on task performance of people with mental retardation	Experimental design	This study examined the effects of goal setting on task performance of people with mental retardation. It does not support the effectiveness of rehabilitation of intellectually disabled people.
4	De Bildt, A., Systema, S., Kraijer, D., Sparrow, S. & Minderaa, R. *Journal of Intellectual Disability Research*, 49(1), 2005:672–681 Country: USA	Adaptive functioning and behavior problems in relation to the level of education in children and adolescents with intellectual disability	Epidemiological study	Insight into the contribution of adaptive functioning and general autistic behavior problems to the level of education in children with intellectual disability. This study does not support the effectiveness of rehabilitation of intellectually disabled people.

	AUTHOR AND JOURNAL	TITLE	DESIGN	EXCLUSION RATIONALE
5	Gates, B., Newell, R. & Wray, J. *Journal of Advanced Nursing,* 34(1), 2001:86–95 Country: UK	Behavior modification and gentle teaching workshops: Management of children with learning disabilities exhibiting challenging behavior and implications for learning disability nursing	Non-randomised controlled trial	Focuses on behavior modification and gentle teaching workshops for nurses and does not support the effects of rehabilitation on intellectually disabled people.
6	Griffiths, P., Bennett, J. & Smith, E. *International Journal of Nursing Studies*, 46, 2009:490-507 Country: UK	The size, extent and nature of learning disability nursing research base: systematic scoping review	Systematic review	This review determines evidence supporting the evidence/research base for learning disability in nursing practice. It does not concentrate on the effects of rehabilitation on intellectually disabled people.
7	Gustafson, A., Ojehagen, A., Hansson, L., Sundlund, M., Nystrom, M., Glad, J., Cruce, G., Jonsson, A. & Fredriksson, M. *Research on Social Work Practice*, 19(3), 2009:281–290 Country: Sweden	Effects of psychosocial interventions for people with intellectual disabilities and mental health problems	Systematic review	Concentrates on psychotherapeutic interventions and does not support the effects of rehabilitation on intellectually disabled people.
8	Hallgren, M. & Kottorp, A. *Journal of Occupational Therapy,* 52, 2005:350–359 Country: Australia	Effects of occupational therapy intervention on activities of daily living and awareness of disability in people with intellectual disabilities	Qualitative research-ethnographic design	This study was excluded after it was critically appraised and received a rating of 5/10 according to the CASP score and a (-) / low rating on the ADA quality rating and was therefore excluded.
9	Hatton, C. *Journal of Mental Health,* 11(4), 2002:357-374 Country: UK	Psychosocial interventions for adults with intellectual disabilities and mental health problems: A review	Review	Intellectually disabled people with psychiatric problems are excluded. This article was excluded because it focuses on psychosocial intervention on individualised psychiatric conditions (e.g. depression, anxiety, compulsions, anger problems and offending behaviours) in adults with intellectual disabilities and mental health problems. The intervention is purely restricted to a range of problems compared to major psychiatric diagnostic systems.
10	Kim, S., Larson, S. & Lakin, K.C. *Journal of Intellectual & Developmental Disability*, 26(1), 2001:35-50 Country: USA	Behavioral outcomes of deinstitutionalization for people with intellectual disability: A review of US studies conducted between 1980 and 1991	Review	This study was excluded because it does not discuss effects of rehabilitation on intellectually disabled people. It supports positive adaptive behavior as an outcome of deinstitutionalisation for people with intellectual disability. Therefore, the change noted in adaptive behaviour change/functioning is attributed to change in the environmental setting rather than from learning acquired in the rehabilitation process.

	AUTHOR AND JOURNAL	TITLE	DESIGN	EXCLUSION RATIONALE
11	Levack, W.M.M., Taylor, K., Siegert, R.J. & Dean, S.G. *Clinical Rehabilitation*, 20, 2006:739–755. Country: New Zealand	Is goal planning in rehabilitation effective? A systematic review	Systematic review	Determines evidence regarding the effects of goal planning in clinical rehabilitation and does not support the effects of rehabilitation on intellectually disabled people.
12	Lin, J.-D., Yen, C.-F., Loh, C.-H., Li, C.-W. & Wu J.-L. *Disability & Rehabilitation*, 28(23), 2006:1499-1506 Country: China	Rehabilitation service utilization and determinants among people with intellectual disability: Preliminary findings in Taiwan	Retrospective, cross-sectional study	This study was excluded because it does not touch on the effects of rehabilitation on intellectually disabled people. The study concentrates on the profile of and utilisation of rehabilitation services by people with intellectual disabilities and also examines the factors that affect the utilisation of these services.
13	Oh, K., Kim, J.H., Rosendal, D.A. & Lui, J.W. *Journal of Rehabilitation,* 71(1), 2005:49–55 Country: South Korea	Vocational rehabilitation in South Korea: Historical development, present status, and future direction	Not stated	Deals with vocational rehabilitation and current problems in the development and delivery of vocational rehabilitation services and does not concentrate on the effects of rehabilitation on intellectually disabled people.
14	Rajska, D. Queen's University, Kingston, Ontario. Thesis, 2009. Country: Canada	Prediction of social competence and social integration in children with or at risk for intellectual disability	Prospective longitudinal study	This study examines early childhood parent–child interaction and factors that may be relevant to later development of social competence and social integration of school-aged children with intellectual disabilities. Therefore, it is not relevant, as it does not focus on the effects of rehabilitation on intellectually disabled people.
15	Strauser, D.R., Lustig, D.C. & Donnell, C. *Rehabilitation counselling bulletin,* 47(4), 2004:215-223. Country: USA	The relationship between working alliance and therapeutic outcomes for individuals with mild mental retardation	Case study	Excluded because this article examines the relationship between the level of working alliance and rehabilitation counselling outcomes for individuals with mild mental retardation.
16	Thompson, J.R., McGrew, K.S., ND Bruininks, R.H. *Journal of Education*, 77 (2), 2002:23-39. Country: USA	Pieces of the puzzle: Measuring the personal competence and support needs of people with intellectual disabilities	Systematic design	Excluded because it concentrates on the conceptualisation of mental retardation and uses theoretical and empirical efforts to identify mental retardation and related disabilities
17	Wallstedt-Paulsson, E. & Eklund, M. *Work: a journal of prevention, assessment and rehabilitation*, 31(4), 2008:473-481 Country: Sweden	Outcome of work rehabilitation for people with various disabilities and stability at a one-year follow-up	Systematic design	Investigates whether the outcome obtained at the end of a comprehensive work rehabilitation programme for people with various disabilities was maintained in a one-year perspective

	AUTHOR AND JOURNAL	TITLE	DESIGN	EXCLUSION RATIONALE
18	Williams, R.M., Westmorland, M.G., Lin, C.A., Schmuck, G. & Green, M. *Disability and Rehabilitation*, 29(8), 2007:607-624 Country: Canada	Effectiveness of rehabilitation interventions in the treatment of work-related low back pain	Systematic review	Evaluates the effectiveness of workplace rehabilitation interventions for injured workers with low back pain
19	Wilner, P. *Journal of Intellectual Disability Research*, 49(1), 2005:73-85 Country: UK	The effectiveness of psychotherapeutic interventions	Randomised control trials (RCT)	Concentrates on the effectiveness of psychotherapeutic interventions
20	Wong, P.K.S. & Wong, D.F.K. *Journal of Intellectual Disability Research*, 52(3), 2008:230-243 Country: Hong Kong	Enhancing staff attitudes, knowledge and skills in supporting the self-determination of adults with intellectual disability in residential settings in Hong Kong: A pretest–posttest comparison group design	Pretest–posttest comparison group design	Not relevant in this context, as it focuses on the effectiveness of staff training to facilitate intellectually disabled residents' self-determination

3.5 STEP 4: CRITICALLY APPRAISE RELEVANT STUDIES

Relevant studies will be critically appraised to assess the methodological quality of selected studies. The aim of critical appraisal in step 4 is to identify studies of good methodological quality.

3.5.1 Quality assessment.

Quality assessment was used to determine the methodological quality and rigour of the included studies. The CASP was used to appraise included studies, to evaluate the validity and credibility and to determine whether the findings can be considered evidence of good-, medium- or low-quality evidence (CASP, 2006).

The following instruments were used within the critical appraisal process:

- Critical appraisal instrument for reviews (CASP, 2006)
- Critical appraisal instrument for RCT's (CASP, 2006)
- Critical appraisal instrument for cohort studies (CASP, 2006)
- Critical appraisal instrument for qualitative research studies (CASP, 2006)

- The evaluation tool for qualitative research studies from the Health Care Practice Research and Development Unit (HCPRDU) (2005)
- Critical appraisal instrument for reviews (CASP, 2006)
- The critical appraisal guidelines for single-case studies (Atkins & Sampson, 2002:107)
- Critical appraisal checklists of ADA 2005
- The John Hopkins Nursing Evidence-based Practice (JHNEBP) research evidence appraisal tool 2007 (Newhouse *et al*., 2007)

For the above mentioned instruments see (see appendix A, B and C).

The CASP instruments was chosen because of its appropriateness and accessibility and because this instrument was validated through piloting in workshops, feedback and review of materials (Public Health Resource Unit (PHRU), 2007).

Additional evaluation tools for qualitative research studies from the HCPRDU were also used to critically appraise qualitative research studies. The reason is because HCPRDU provides a complete overview of the following subsections: study evaluative overview; setting and sample; ethics; data collection; analysis; potential researcher bias; policy and practice implications and other comments (HCPRDU, 2005).

As the CASP and the HCPRDU do not provide specific tools for single-case studies, the critical appraisal guidelines for single-case research developed by Atkins and Sampson (2002:107) were used, because these tools were specifically designed to evaluate single-case studies. These tools were previously used in over a hundred published single-case studies in academic and research journals that were part of a pilot study on the use of a systematic review of evidence methodology for information systems research (Atkins & Sampson, 2002:107).

For studies that did not fit in any of the critical appraisal tools used, the JHNEBP research evidence appraisal tool was used (Newhouse *et al.,* 2007:206). This tool can be used for both quantitative (experimental, quasi-experimental and non-experimental) and qualitative studies. This tool contains questions that guide the researcher in determining the level of strength of recommendations and the quality of the primary

studies included in the review (Newhouse *et al.,* 2007:99). The JHNEBP tool gauges the strength and quality of recommendations made on the basis of research evidence.

Critical appraisal is crucial and important for selecting studies of good quality and to be able to answer the review question appropriately. As a requisite for critical appraisal, the ADA evidence analysis manual (ADA, 2005:54-55) recommends the completion of specific evidence worksheets for each individual study. Each study was critically appraised according to the evidence worksheet/checklists (see appendices A and B).

3.5.2 Evidence class rating

Evidence was analysed in accordance with the evidence class rating recommended by ADA to enhance rigour of the study (ADA, 2009:29-30). The table below firstly lists and categorises the research studies/designs into the following two categories:

- Primary/original research designs
- Secondary research designs, which include reviews, meta-analysis and synthesis of previously reported studies

Secondly, these studies are classified according to type of study designs and then organised into hierarchy based on the ability of the design to test causal relationships.

The class evidence has been adapted to comply with the current study and is displayed in Table 3.6.

Table 3.6: Classes of evidence (adapted from ADA, 2009:29-30)

Primary reports of new data collection		Reports that synthesise or reflect on collection of primary reports	
A	• RCT	**M**	• Meta-analysis or systematic review • Decision analysis • Cost-benefit analysis • Cost-effective study
B	• Cohort study		
C	• Non-randomised trials with concurrent historical controls • Case controls • Study of sensitivity and specificity of diagnostic test • Population-based descriptive studies • Time series	**R**	• Narrative review • Consensus statement • Consensus report
D	• Cross-sectional study • Case series • Case report • Before–after study	**X**	• Health expert opinion

The outcome of the appraisal was discussed accordingly. In the context of evidence-based practice, evidence from high-quality, resent systematic reviews of randomised clinical trials is usually regarded as the strongest evidence on which to base decisions regarding efficiency (Melnyk & Fineout-Overholt, 2005:11).

The scoring system of the CASP was adapted as follows by the researcher for inclusion and exclusion purposes after critical appraisal:
High-quality rating: ≥ 8/10
Medium-quality rating: ≥ 5/10 to < 8/10
Low-quality rating: ≥ 1/10 to < 5/10

The researcher consulted with the study supervisors regarding studies that can be regarded as rigorous and thus included for data extraction. Studies included were to obtain a score of at least 6/10 in each case where CASP was used as critical appraisal tool during the critical appraisal process. Furthermore, studies were graded according to

definitions, which included I to V regarding strength of evidence (ADA, 2009:62-87), and symbols were used such as high-quality (+), medium-quality ((ø) and low-quality (-) to provide a quick overview of the quality rating of appraised studies. The comparison of the quality rating system of the ADA (2005:26-33) and the CASP (2006) scores is displayed in Table 3.7.

Table 3.7: Quality rating (adapted from ADA, 2005:27–30; ADA, 2009:41-46; CASP, 2006)

Description in words	ADA quality rating	CASP score quality rating
High	(+)	≥ 8/10
Medium	(ø)	≥ 5/10 to < 8/10
Low	(-)	≥ 1/10 to < 5/10

Critical appraisal was done by the reviewer in consultation with the study supervisors and the second independent reviewer, who has experience in conducting systematic reviews. Results from both reviewers were compared and discussions were held to reach consensus in cases of disagreement on the quality of studies and on whether studies should be included in or excluded from data extraction.

3.5.3 Critical synthesis

Critical synthesis of the individual findings of the primary studies towards a conclusion entailed data comparison, conclusion drawing and verification. Data comparison is a repetitive process of examining the data display to identify patterns, themes and relationships of the variables. The drawing of conclusions and verification thereof are on a higher level of abstraction than data comparison. Drawing conclusions entails subsuming the particulars into the general and developing a conceptual model that is continually revised in order to be inclusive of as much data as possible. Data synthesis requires honesty, transparency and a thorough reflection and exploration from the

researcher that should be verified through continuous recordkeeping during the whole process to enhance rigorous methodology (Whittemore & Knafl, 2005:551).

Verification with primary studies in terms of discernment of identified patterns, themes and relationships described in the final conclusion is required to enhance accuracy and confirmability. Addressing conflicting evidence is a considerable challenge and should be dealt with either by voting, comparing the frequency of significant positive findings against significant negative findings, exploration of confounding variables or motivation for the need of further research (Whittemore & Knafl, 2005:551). In this study, conflicting evidence was addressed by including the outcomes of rigorous and relevant studies in the conclusion statements, whether the studies contain conflicting evidence or not.

3.6 SUMMARY

This chapter discussed the realisation and findings of the research study. In the next chapter, the findings of the study and the summarising of evidence are discussed.

CHAPTER 4

FINDINGS OF THE STUDY AND SUMMARISING EVIDENCE

4.1 INTRODUCTION

This chapter includes the findings and summarise the evidence by discussing the data extraction (including the characteristics of the final sample) and the data synthesis (including a summary of the findings and statements regarding the evidence).

4.2 STEP 5: DATA EXRACTION AND SYNTHESIS

Before the details of the data extraction and data synthesis (analysis) are provided, the characteristic of the final sample is explained.

4.2.1 Characteristic of the final sample

The following seven (7) studies were reviewed, appraised and used in the synthesis of data:

4.2.1.1 Randomised control trials (RCT) (2)

Two RCT design studies were gathered. The first RCT design was the one of Drysdale *et al.* (2008) on the effectiveness of training for the community skills of children with intellectual disabilities. It was critically appraised and rated class A and received a quality rating of 6/10 according to the CASP score and a medium/(ø) on the ADA quality rating. The second RCT design was that of Russell *et al.* (2004) on family intervention and the acquisition of adaptive behaviour among intellectually disabled children. It was critically appraised and this study fell in evidence class A and received a quality rating of 8/10 according to the CASP score and a high/(+) on the ADA quality rating. Both studies confirmed medium/(ø) and high/(+) quality ratings and therefore were included in the short list after they were critically appraised with the ADA tool.

4.2.1.2 Cohort study (1)

Only one cohort study (Beatle-Brown *et al.,* 2000) was identified. Changes in skills of people with intellectual disability were critically appraised and the study was rated class C and received a quality rating of 8/12 according to the CASP score and a high/(+) on the ADA quality rating.

4.2.1.3 Single-case design (3)

There were three single-case design studies that were critically appraised. The first one is a quantitative single-case design of Hallgren and Kottorp (2005) on the effects of occupational therapy intervention on ADL and awareness of disability in people with intellectual disabilities. This study fell in the evidence class C and received a quality rating of 8/12 according to the CASP score and medium/(ø) according to the ADA rating. The second single-case design is one of Kottorp *et al.* (2003) on client-centred occupational therapy for people with mental retardation. It was rated class C and received a quality rating of 7/11 according to the CASP score and a medium/(ø) on the ADA quality rating. The third one is the experimental single-case design study of Applegate *et al.* (2008) on knowledge of results and learning to tell time in an adult male with an intellectual disability. The JHNEBP tool was used to appraise studies with an experimental single-case design. This study fell in the evidence class D and received a quality rating of 7/10 and rated medium/(ø) on the ADA on quality rating. Therefore, these three studies were also included in the short list for data extraction and evidence analysis.

4.2.1.4 Qualitative research (1)

Only one qualitative ethnographic study design of Lloyd (2007) on modelling community-based self-help mental health rehabilitation reform was identified. This study was critically appraised and rated class C and received a quality rating of 6/10 according to the CASP score and a medium/(ø) on the ADA quality rating.

4.2.1.5 Data extraction and summary

All the studies that complied with the selection criteria and that were found to be medium to high quality after critical appraisal were included in the short list that was used for data extraction. This was done according to two steps, namely data reduction and data display. A summary of relevant studies was made according to study design, time span, sample, setting, data-collection instruments, statistical analysis, intervention-versus-control, evidence class, quality rating and bottom-line findings. The summary was created in table format for the sake of display and synthesis of evidence. The summary for data extraction is displayed in Table 4.1.

Table 4.1: Data extraction of systematic reviews included for synthesis of evidence

Studies	Sample	Search	Critical appraisal method and tool
1. Applegate, S.L., Stein, F. & Maitra, K. 2008. Knowledge of results and learning to tell time in an adult male with an intellectual disability. *Occupational therapy international*, 15(1):32–44. Country: USA	Single-subject study design with one participant	**Keywords:** instrumental; activities of daily living; knowledge of results; mental retardation	CASP, 2006. Single-subject study design 7/10 – included
Research question and outcome	**Findings, limitations and recommendations**	**Evidence class / quality rating**	**Bottom-line findings**
Research question: Does knowledge of results work better at 100% or at a reduced frequency for individuals with intellectual disability, especially in terms of their ability to learn to tell time? **Outcome:** The results of the study generally indicate that incorporating knowledge of results into the learning strategy of an individual with intellectual disability facilitated the ability to tell time more accurately.	**Findings:** The study findings indicate that the participant who received greater amounts of feedback during skills acquisition obtained higher scores during task performance. Overall, these studies found that, when given 100% knowledge of results, individuals performed better in the acquisition phase and that provision of knowledge of results at a reduced frequency enables better performance in the retention phase. **Limitations:** As this is a single-case research design, the results of the study cannot be generalised to the intellectually disabled or to other populations. Little is known about the applicability of using knowledge of results strategies with individuals with intellectual disability. It appears that knowledge of results may facilitate individuals' ability to perform a motor task; unfortunately, the tasks involved in some knowledge of results studies did not involve any type of ADL or instrumental ADL training (Gillespie 2003; Rice & Hernandez, 2006). Consequently, no research has been done to investigate this strategy using a task where the individuals learn ADL or instrumental ADL. Learning ADL can help any individual reach his or her full potential. Learning ADL is very specific to every individual. For instance, the manner in which one individual learns to tell time may be completely different from how another individual learns the same skill (Applegate *et al.*, 2008:35). Another limitation is that knowledge of results functions to guide performance rather than enhance the learning process. **Recommendations:** More research is needed in order to establish the efficacy of the use of knowledge of results when teaching individuals the ability to tell time, and this research should take into account the apparatus used and the participants' skills level and also use a larger population of individuals with intellectual disabilities. This study needs to be replicated using a traditional experimental design to increase external validity.	Evidence rating (D)	The participant in the study demonstrated an increase in their performance ability to correctly identify the time on an analogue clock face.

Studies	Sample	Search	Critical appraisal method and tool
2. Beatle-Brown, J., Murphy, G., Wing, L., Gould, J., Shar, A. & Holmes, N. 2000. Changes in skills for people with intellectual disability: A follow-up of the Camberwell Cohort. *Journal of Intellectual Disability Research*, 44(1):12–24. Country: UK	Cohort study of 146 intellectually disabled children	**Keywords:** autism; changes in skills; longitudinal study; social impairment	CASP, 2006. Cohort study 8/12 – included
Research question and outcome	**Findings, limitations and recommendations**	**Evidence class/quality rating**	**Bottom-line findings**
Research question: Not specified **Outcome:** Results indicated that skills had improved in many areas between different assessment timeframes. Improvement was more noticeable for the children who had been youngest at the time.	**Findings:** Findings indicate that skills seem to increase over time for people with intellectual disability in general (changes in cognitive ability and for three main skill categories: self-care skills, communication skills and educational achievements). This increase is greater at younger ages, and for the most part, is also greater for those of a higher IQ. The effect of IQ is also reflected in the results from the analysis of the residential situation. The residential situation is said to affect several of the skills, it is stated that intellectual disabled people living at home, with relatives or foster parents showed higher increases on almost every skill category than those in hospitals and charity-run homes, for example. This finding could be explained by the effect of IQ and overall ability. Those children who were less able mentally and physically were those who were placed in hospitals or specialised homes, while those who were more able stayed at home with their parents for longer. **Limitations:** From the present analysis, it has not been possible to demonstrate that residential situation affect the way the skills improved over time. Social skills also seem to affect the development of few skills, in particular those within the category of communication. **Recommendations:** Further analysis is needed to clarify whether the residential situation affects the way skills improve over time.	Evidence rating (B)	The encouraging findings are that skills seem to increase over time for people with intellectual disabilities in general. These increases are greater at the younger ages and for the most parts for those of a higher IQ. The residential situation is also said to affect several of the skills. Intellectual disabled people living at home, with relatives or foster parents showed higher increases on almost every skill category than those in hospitals and charity-run homes.

Studies	Sample	Search	Critical appraisal method and tool
3. Drysdale, J, Casey, J. & Porter-Armstrong, A. 2008. Effectiveness of training on the community skills of children with intellectual disabilities. *Journal of Occupational Therapy*, 15:247–255. Country: Northern Ireland	A blinded RCT with 40 children: **-**Treatment group1: *n=12* - Treatment group 2: *n=12* - Control group *n=16*	**Keywords:** community living skills training; occupational therapy; shopping skills; skills acquisition; task analysis; telephone calls Search databases keywords limitations: AMED Independent living skills 1997–2008; BAOT/COT library training; British Nursing Index Independent; Living skills, English language only; CINAHL: Community living skills; Cochrane Library: Training; EMBASE: Community living skills; Medline: Functional skills; Omni: Shopping skills; PsychInfo: Telephone skills; ProQuest: adolescents; Swetswise: children; Web of science learning disabilities 1997-2008; and English language only	CASP, 2006. RCT 6/10 – included
Research question and outcome	**Findings, limitations and recommendations**	**Evidence class / quality rating**	**Bottom-line findings**
Research question: Is community living skills training effective in improving the functional ability of children with moderate learning disabilities? **Outcome:** Results suggested that community skills training was effective in improving the functional ability of people with intellectual disabilities.	**Findings:** Findings indicated that classroom-based training was as effective as that supplemented by community-based training. **Limitations:** The sample size was very small in the treatment groups, limiting the validity of the outcomes **Recommendations:** 1. Further research on telephone skills training, using a more sensitive measurement tool, would be beneficial. 2. Future research should incorporate larger sample sizes to allow more definite conclusions to be drawn.	Evidence rating (A)	The outcome from this study supports previous findings that community skills training can be effective in improving the functional ability of people with intellectual disabilities. The outcomes were significant for shopping skills.

Studies	Sample	Search	Critical appraisal method and tool
4. Hallgren, M. & Kottorp, A. 2005. Effects of occupational therapy intervention on activities of daily living and awareness of disability in people with intellectual disabilities. *Journal of Occupational Therapy,* 52:350–359. Country: Australia	Quantitative single-case design, using six participants who satisfied the inclusion criteria	**Keywords:** activities of daily living; awareness of disability; evaluation; intellectual disability; intervention	CASP, 2006. Quantitative single-case design 7/10 – included
Research question and outcome	**Findings, limitations and recommendations**	**Evidence class / quality rating**	**Bottom-line findings**
Research question: What are the effects of an occupational therapy intervention program on ADL ability and awareness of disability in people with intellectual disabilities? **Outcome:** The results indicated that performance in people with mild to moderate intellectual disability improved in terms of ADL after the intervention phase.	**Findings:** This study supports the findings of the pilot study of Kottorp *et al.* (2003). It is recommended that five sessions are sufficient to achieve a detectable clinical improvement in ADL performance. It is also recommended that clients be made aware of their disability, as awareness of disability helps active participation in rehabilitation (Katz, 2002). **Limitations:** The number of participants was too small to allow generalisation to a larger population. Another limitation of the study may be that the evaluations carried out in the follow-up phase were based on observation of the tasks that were used in the intervention phase. Another reason for limited improvement may be that person with intellectual disabilities have a diminished capacity to understand the underlying abstract meaning of questions asked and to understand causal relationships – this may impact on their ability to think and reflect upon ADL performance. **Recommendations:** The authors suggest that changes could be made to the programme to make it more clinically effective and also suggest that examination of the effectiveness of the programme using a larger sample of participants with different levels of intellectual disability was needed to validate their conclusions. They also suggest that to obtain further evidence of the effectiveness of the programme, future studies should be in the form of controlled designs in order to compare the efficacy of the programme with that of traditional services.	Evidence rating (B)	ADL performance is a factor for developing autonomy and independence with intellectual disability (Kjellberg, 2002; Ringsby, 2002), consequently, decreasing the need for assistance in everyday life or in general. It is concluded from this study that people with intellectual disabilities can benefit from occupational therapy interventions to improve ADL ability, even in the absence of any change in their awareness of disability.

Studies	Sample	search	Critical appraisal method and tool
5. Kottorp, A., Hallgreng, N., Bernspang, B. & Fisher, A.G. 2003. Client-centred occupational therapy for people with mental retardation: Implementation of an intervention programme in activities of daily living task. *Journal of Occupational Therapy,* 10:51–60. Country: USA	Quantitative single-case design with three participants	**Keywords**: evaluation; many-faceted Rasch measurement; mental retardation; occupational performance; single-case design	CASP, 2006. Quantitative single-case design 7/11 – included
Research question and outcome	**Findings, limitations and recommendations**	**Evidence class/quality rating**	**Bottom-line findings**
Research question: Does a client-centred, occupation-based intervention programme result in enhancing both awareness of disability and ADL ability for clients with mental retardation? **Outcome:** The results from this study indicate that an occupational therapy intervention programme had a positive effect on ADL process ability for three people with mental retardation.	**Findings:** Findings indicated that all three participants improved in ADL process ability. **Limitations:** The major limitation in this study was the amount of variability and fluctuations in the data even though differences before and after the intervention programme were present for all participants. Given this variability, all results should be viewed with caution. Despite this, the results from the study suggest that instruments such as the Assessment of Motor and Process Skills (AMPS) and the Assessment of Awareness of Disability (AAD) are sensitive enough to detect changes in performance. **Recommendations:** It is critical that occupational therapists continue to develop and evaluate programmes that are based on client-centered, top-down and occupation-focused approaches designed to enhance the ability to perform daily life tasks that clients find meaningful to engage in. Thus evaluation of transfer in future outcome studies would enhance the evaluation of occupational therapy intervention programmes. Further research is needed to determine whether such a programme also leads to improved ADL, motor ability and awareness of disability in people with mental retardation.	Evidence rating (B)	Results from this study indicate that an occupational therapy intervention programme, including restorative occupation and adaptive occupation, is effective in improving the ability of people with mental retardation to carry out ADL efficiently and safely.

Studies	Sample	Search	Critical appraisal method and tool
6. Lloyd, R. 2007. Modelling community-based self-help mental health rehabilitation reform. *The Royal Australian and New Zealand College of Psychiatrists*, 15:99–105. Country: Australia	Qualitative research ethnographic method supported by a collaborative enquiry approach to participative action research. The source population involved gathering a group of 18- to 35-year-old strangers from among the general public, in a mixed-gender group, with same-gender pairing of buddies. The researcher became totally embedded in the community of participants and assumed the role of a tribal leader.	**Keywords:** community of belonging; mental health consumer; narrative therapy; recovery; rehabilitation	CASP, 2006 Qualitative study design 6/10 – included
Research question and outcome	**Findings, limitations and recommendations**	**Evidence class/quality rating**	**Bottom-line findings**
Research question: Not specified **Outcome:** The results indicated that it was possible to generate increased wellbeing and confidence for more independent living among people living with the challenge of intellectual disability. Their ongoing wellbeing depends equally on community settings of shared affirming energy and daily living feedback, mirroring and support. Therefore, the open valuing approach of psychosocial rehabilitation creates open and ongoing mutual support in an equitable and non-labelling or patronising way, and can also create much more cost-effective forms of CBR as compared to the current medical models (e.g. of allocating one facilitator to 60 participants over two years, with an average time commitment of two days a week).	**Findings**: People living with intellectual disability experience improved increased quality of life and self-determining sense of self when they are included in mixed, open urban tribes or communities of belonging. Being with other participants also provides shared testimonies of experience, which give each other encouragement and stimulation, generating motivation and strengthened intention for life. People reported feeling well, showed evidence of finding more energy for life and began pursuing more diverse activities and creativity. **Limitations:** The researcher became totally embedded in the community of participants and assumed the role of the tribal leader. Participants were supposed to keep a fourth nightly life journal of feelings experienced for a year. Others declined to this as they were not comfortable, as they had no insight to keep a written journal to determine all their participative activities. **Recommendations**: Further research into the efficacy of such approaches seemed warranted by this exercise.	Evidence rating (C)	The bottom line is that this process of person-valuing approach to psychosocial rehabilitation showed to produce efficacious results in the lives of all participants. An interactive symbolic environments elicits important information about practical ways to assist the daily lives of peoples living with psychosocial challenges in an environment if sharing and being with other participants revealed that intellectually disabled people feel better about themselves and express more confidence and independence, especially when they are in a community of belonging where respectful, equitable relationships of safety and trust are established. The participants were assisted to help themselves and each other in terms of recovery, growth and development when they are enabled to come together in a vulnerable, safe and trusting environment of sharing and caring. Successful psychosocial rehabilitation depends on people's motivation for recovery, growth and development, and this happens best in communities of belonging where there is shared affirming energy and daily living feedback and support, and not in isolated group homes or through patronising professional service delivery that pathologises its recipients. This type of rehabilitation provides cheaper bottom-line costs, i.e. it creates a much more cost-effective CBR. Therefore, people living with psychosocial challenges require clinical assistance to get their lives in balance.

Studies	Sample	Search	Critical appraisal method and tool
7. Russel, P.S., John, J.K., Akshmanan, J., Russel, S. & Lakshmidevi, K.M. 2004. Family intervention and acquisition of adaptive behaviour among intellectually disabled children. *Journal of Learning Disabilities*, 8(4):383–395. Country: India	RCT design with 57 children and their parents	**Keywords:** adaptive behavior; family; intellectual disability	CASP, 2006 RCT design 8/10 – included
Research question and outcome	**Findings, limitations and recommendations**	**Evidence class/quality rating**	**Bottom-line findings**
Research question: Not specified **Outcome:** Intellectually disabled children showed a significant improvement in the acquisition of adaptive behavior after training. Improvement was noted in the intervention group in the areas of self-help general, self-help dressing and socialisation in addition to the areas of self-help eating, communication and locomotion. However, areas of occupation and self-direction did not show a statistically significant increase in scores despite the clinical improvements noted in these areas.	**Findings:** From this research it is stated that the significant increase in adaptive functioning among the intervention group children might have followed from factors and processes unknown. However, it is known that parents of children with disabilities place importance on adaptive behaviour development. **Limitations:** The study results showed the following limitations: Firstly, a study designed to assess the effects of any intervention module added to an already effective multimodal therapy regime must demonstrate the incremental benefit in relation to the existing treatments components and passage of time. Secondly, the short interval between pre- and post-intervention assessments of the adaptive behavior makes the data vulnerable to learning effects. As the study did not include the additional control groups, it is not possible to measure the presence or size of such effects. Thirdly, different therapists were involved in the adaptive behavior training and they might have mediated non-specific treatments effects. **Recommendations:** This study emphasises that parental attitude enhancing module should be a component of multimodal adaptive behavior therapy programmes for intellectually disabled children in developed countries with deinstitutionalisation or Third World countries with CBR approach. In this investigation, significant increase in the acquisition of adaptive behavior in the intervention group and the increases were marked for social age, self-help dressing, self-help eating, socialisation, communication and locomotion. As seen in the children's improved ability to play with toys on their own, use crayons or be left to care for self and to purchase in simulated shopping conditions.	Evidence rating (A)	Investigation clearly showed additive efficacy of enhanced parental attitude in the acquisition of adaptive behavior among children with intellectual disability; the minimum additive efficacy achieved was 80%.

4.2.2 Analysis strategy

The strategy used to analyse the findings was to provide the summary of the relevant findings of each study. Findings gathered were combined and summarised; where after the conclusion statements were made.

4.2.3 Summary of findings

A conclusion of the summary of the findings of the included studies according to the following research question is provided:

What were the effects of rehabilitation on intellectually disabled people?

In order to answer this question, the summary of the findings of all the included studies (final sample) is provided.

Finding 1
Findings indicated that classroom- and a community-based skills training are effective in improving the functional ability of people with intellectual disabilities. Therefore, it is important that the abovementioned training interventions are conducted on an ongoing basis in order to promote independence in terms of ADL of people with intellectual disabilities (Drysdale *et al*., 2008).

Finding 2

Findings indicate that because of rehabilitation skills seem to increase over time for people with intellectual disabilities in general. There is a great improvement of skills for younger people with higher IQs. Improved changes are seen in the cognitive ability and for three main skill categories, namely self-care skills, communication skills and educational achievements. On the other hand, social skills seem to affect the development of few skills, in particular those within the category of communication. From this information, it seems that the rehabilitation of intellectually disabled people is effective, again confirming the necessity of this research (Beatle-Brown *et al*., 2000:22).

Finding 3

People with mild to moderate intellectual disabilities improved in terms of ADL after rehabilitation. Therefore people with intellectual disabilities can benefit from interventions to improve their ADL ability (Kjellberg *et al*., 2002, cited in Hallgren & Kottorp, 2005).

Finding 4

In addition, an occupational therapy intervention programme including restorative occupation and adaptive occupation is effective in improving the ability of intellectually disabled people to carry out ADL tasks efficiently and safely. Findings clearly indicated that all participants involved improved in terms of ADL. (Kottorp *et al*., 2003).

Finding 5

Investigations clearly showed additive efficacy of enhanced parental attitude in the acquisition of adaptive behavior among children with intellectual disabilities, and the minimum additive efficacy achieved was 80%. Intellectually disabled children showed a significant improvement in the acquisition of adaptive behavior after training. Improvement was noted in the intervention group in the areas of self-help general, self-help dressing and socialization, in addition to the areas of self-help eating, communication and movement (Russell *et al.*, 2004).

Finding 6

Findings from Applegate *et al.* (2008:32–44) indicated that knowledge of results provides a strong guidance function for future performance. Knowledge of results may provide participants with information needed to change their performance before the next performance occurs. Findings indicated that participants who received greater amounts of feedback during skills acquisition improved their performance and obtained higher scores during task performance. Overall, these studies found that, when given 100% knowledge of results, individuals performed better in the acquisition phase, however, provision of knowledge of results at a reduced frequency enables better performance in the retention phase. Therefore, the results generally indicate that incorporating knowledge of results into the learning strategy for a person with an intellectual disability facilitates the ability to tell time more accurately.

Finding 7

Findings indicated that people living with intellectual disabilities experience improved quality of life and a self-determining sense of self when they are included in mixed, open urban tribes or communities of belonging. Being with other participants also provides shared testimonies of experience, which give participants encouragement and stimulation, generating motivation and strengthened intention for life. They also reported feeling well, showed evidence of finding more energy for life and began pursuing more diverse activities and creativity.

It is possible to generate increased wellbeing and confidence for more independent living among people with intellectual disabilities. The results indicated that intellectually disabled people had equal contributions to make to the group and learned something from others and this led to efficacious outcomes such as effective life support experiences, reduced recidivism, improved quality outcomes and the generation of involved and enriched community members (Lloyd, 2007:101–103).

4.3 SUMMARY

This chapter explained the findings and summarised the evidence by discussing the data extraction (including the characteristics of the final sample) and the data synthesis. The characteristic of the final sample was stated. In order to answer the research question, a summary of findings of the reviewed studies was provided.

The following final chapter includes the conclusions, limitations and recommendations for nursing practice, education and research.

CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The overview of the conclusion statements regarding the effects of rehabilitation on intellectually disabled people, the evaluation of rigour and a discussion of limitations are presented in this chapter. Recommendations for research, education and nursing practice are also included.

5.2 CONCLUSIONS

Evidence gathered from different studies indicate that mildly and moderately intellectually disabled people benefit from rehabilitation intervention. However, more research is needed to verify and validate the findings of this study in terms of the South African context.

The following question was stated in Chapter 1: What are the effects of rehabilitation on intellectually disabled people?

To answer the question, conclusion statements have been developed, and are outlined as follows:

Conclusion statement 1

Classroom- and a community-based skills training are effective in improving the functional ability of people with intellectual disabilities. Therefore, it is important that the abovementioned training interventions are conducted on an ongoing basis in order to promote independence in terms of ADL of people with intellectual disabilities.

Conclusion statement 2

After rehabilitation, marked improvement of skills is noted in younger intellectually disabled people with higher IQs. Skills seem to increase over time for people with intellectual disabilities in general. Improved changes are noted in cognitive abilities and

in the following three main skill categories: self-care skills, communication skills and educational achievements. The residential situation is also said to affect several of the skills. Intellectual disabled people living at home, with relatives or foster parents showed higher increases in almost every skill category, while those in hospitals and charity-run homes showed fewer increases. From this information it seems that the rehabilitation of intellectually disabled people appears to have benefit in cognitive dimension, self-care skills and communication skills.

Conclusion statement 3

People with mild to moderate intellectual disability benefit from occupational therapy interventions; they showed improvement in terms of activities of daily living (ADL). ADL performance is a factor for developing autonomy and independence and consequently decreases the need for assistance in everyday life or in general. It is concluded from this study that people with intellectual disabilities can benefit from occupational therapy interventions to improve their ADL ability. Therefore, with collaboration between occupational therapists, other mental health care workers and nurses, rehabilitation of intellectually disabled people will be effective.

Conclusion statement 4

In support of the above paragraph, an occupational therapy intervention programme including restorative occupation and adaptive occupation is effective in improving the ability of intellectually disabled people to carry out ADL efficiently and safely. In this case, further research is also needed to determine whether such a programme also leads to improved ADL, motor ability and awareness of disability.

Conclusion statement 5

Investigations also clearly show additive efficacy of enhanced parental attitude in the acquisition of adaptive behavior among children with intellectual disabilities. The minimum additive efficacy achieved was 80%. Intellectually disabled children show a significant improvement in the acquisition of adaptive behavior after training. Improvement was noted in the intervention group in the areas of self-help general, self-

help dressing and socialisation in addition to the areas of self-help eating, communication and locomotion.

Conclusion statement 6

Prior knowledge of results during the process of rehabilitation provides a strong guidance function for future performance. Knowledge of results may provide participants with information needed to change their performance before the next performance occurs. Findings indicated that participants who received greater amounts of feedback during skills acquisition improved their performance and obtained higher scores during task performance. Overall, these studies found that, when given 100% knowledge of results, individuals performed better in the acquisition phase, however, provision of knowledge of results at a reduced frequency enables better performance in the retention phase. Therefore, the results generally indicate that incorporating knowledge of results into the learning strategy for a person with an intellectual disability facilitates the ability to tell time more accurately.

Conclusion statement 7

The bottom line is that the process of person-valuing approach to psychosocial rehabilitation produces efficacious results in the lives of all participants. Interactive symbolic environments elicit important information about practical ways to assist in the daily lives of people living with psychosocial challenges in an environment of sharing and being with other participants. It furthermore reveals that intellectually disabled people feel better about themselves and express more confidence and independence, especially when they are in a community of belonging where respectful, equitable relationships of safety and trust are established. Successful psychosocial rehabilitation depends on the person's motivation for recovery, growth and development, and this happens best in communities of belonging where there is a shared affirming energy and daily living feedback and support and not in isolated group homes or patronising professional service delivery that sickens its recipients. This type of rehabilitation provides cheaper bottom-line costs, in other words it creates much more cost-effective CBR. Therefore, people living with psychosocial challenges require clinical assistance

to get their lives in balance. For example, these people need to be assisted to help themselves in order to be independent individuals. In this case, nurses of all categories, that is, professional nurses, enrolled nurses and assistant nurses, need to be trained in how to assist people with intellectual disabilities in order to make them independent individuals.

Overall conclusions: The review question stated for this research was as follows: What are the effects of rehabilitation on intellectually disabled people? To answer this question a systematic review was done to critically synthesize the best evidence on the effects of rehabilitation on intellectually disabled people. From the findings gathered, conclusions were made. Therefore the review question was answered and the overall aim of the study was achieved.

5.3 EVALUATION OF RIGOUR

In this systematic review study, rigour was maintained by ensuring that all decisions are motivated in all different stages, namely the problem-identification stage, the literature search stage, the critical appraisal stage, the data synthesis stage and the presentation (Whittemore & Knafl, 2005:552).

5.3.1 Problem-identification stage

In this study, the problem and the purpose were clearly stated and supported by the evidence of a preliminary literature review. The systematic review method started with a clear identification of the problem that the review intends to answer as well as the review purpose (Whittemore & Knafl, 2005:548). To enhance clarity and rigour, the review question developed addressed the following elements of PICOT (Patient/population, Intervention, Comparison (not applicable in this study), Outcome and Time (not applicable). The terminology used in the review was also defined. The conceptual model (Botes's model for nursing research) was used to support the stated problem (Botes, 2005:6). A systematic review was chosen as a design to answer the review question stated.

5.3.2 Literature search stage

A broad, well-defined literature search strategy was conducted to provide an adequate comprehensive database that ensures accurate results and enhances rigour of the study by limiting publication bias and ensuring adequate results at the end. The search covered all the literature from different databases. The literature search process was clearly documented in the method section and included a broad combination of search terms, and the inclusion and exclusion criteria were determined for the primary source to enhance rigour (Hemingway & Breton, 2009:4; Whittemore & Knafl, 2005:548). An experienced librarian at the Ferdinand Postma Library at North-West University in Potchefstroom was consulted to assist with the literature search.

5.3.3 Critical appraisal stage

The researcher conducted the appraisal strategy according to the steps of the systematic review to ensure that only high-quality evidence was included for data extraction. The researcher focused on the appropriateness of the study design of the included studies in relation to the study question rather than focusing on the appropriate method. This ensures that high-quality types of research can be conducted in an appropriate and biased way (CRD, 2009:33).

To enhance reliability and validity during the critical appraisal process, the following standardised CASP instruments were used:

- Critical appraisal instrument for reviews (CASP, 2006)
- Critical appraisal instrument for RCTs (CASP, 2006)
- Critical appraisal instrument for cohort studies (CASP, 2006)
- Critical appraisal instrument for qualitative research studies (CASP, 2006)
- The evaluation tool for qualitative research studies from the HCPRDU (2005)
- Critical appraisal instrument for reviews (CASP, 2006)
- The critical appraisal guidelines for single-case studies (Atkins & Sampson, 2002:107)
- The JHNEBP research evidence appraisal tool (Newhouse *et al.*, 2007)

The CASP instrument was chosen because of its appropriateness and accessibility and because this instrument was validated through piloting in workshops, feedback and reviews. Other instruments used were chosen based on their ability to fit the design of the included studies best. Poor-quality studies were excluded, but were still discussed in the review report. Assessment was ideally conducted by the second reviewer to enhance reliability and validity during appraisal.

5.3.4 Data synthesis stage

Rigorous data synthesis reflects honesty, transparency and a thorough reflection and exploration and is verified by continuous recordkeeping during the whole process (Whittemore & Knafl, 2005:551).

5.3.5 Presentation

A separate chapter (chapter 5) reports on conclusions, recommendations and limitations of the study. Furthermore, the outcomes of the systematic review will be submitted for publication in a peer-review journal. The entire systematic review was presented as transparently as possible using tables and flowcharts, where applicable. In addition, reporting was done as appropriately as possible to prevent missing any relevant information.

5.4 LIMITATIONS

The following limitations were identified:

- This study used only electronic databases subscribed to by North-West University. This is a limitation because other universities might have different databases. This limitation was overcome by using multiple sources to obtain both published studies, such as in electronic databases, and unpublished studies (grey literature and through manual search).

- This systematic review was conducted on studies presenting mostly with medium and high-quality ratings and a mix of class A, C and D evidence. Limited

generalisation in this context may be due to: class C / single-case study designs which have a small number of participants to allow generalisation to a larger population; another reason was limited improvement in skills, which may be attributed to the fact that other intellectually disabled people have a diminished capacity to understand the underlying abstract meaning of questions asked and causal relationships. This may impact on their ability to think and reflect upon ADL performance. The major limitation of this study was the amount of variability and fluctuations in the data even though differences before and after the intervention programme were present for all participants. Given the variability, all results should be viewed with caution. Because other studies did not include additional control groups, it is not possible to measure the presence or size of such effects.

- Further research is still needed because research evidence related to the effects of psychosocial intervention on the intellectually disabled person is sparse. There is scattered small-scale evidence suggesting that various psychosocial interventions may be feasible interventions for people with mild intellectual disabilities.

5.5 RECOMMENDATIONS

Many intellectually disabled people experience difficulties in obtaining appropriate rehabilitation intervention and continued assistance. Findings among people with disabilities highlight that the health care and the welfare systems should create a coordinated system to improve the efficacy of rehabilitation services among people with intellectual disabilities. Because intellectually disabled people have multiple health care needs, heath care policy should reorient the health care system to respond appropriately to their needs.

5.5.1 Recommendations for nursing practice

There is a real need for rigorous practice-based evidence to underpin the increasing range of treatment options for this group of service users. Rehabilitation training should

therefore be incorporated into nursing practice. This will enable nurses to equip intellectually disabled people with skills to acquire basic life skills and to manage ADL. Since nurses form part of the multidisciplinary team, it is important that occupational therapists collaborate with the nurses in order to ensure that the rehabilitation of intellectually disabled people is done effectively and on an ongoing basis.

5.5.2 Recommendations for nursing education

Nurses of all categories, that is professional nurses, enrolled nurses and assistant nurses, need to be educated, trained and equipped with rehabilitation skills and knowledge to assist people with intellectual disabilities at institutional/community settings in order to promote their quality of life and make them independent individuals for inclusive living.

5.5.3 Recommendations for nursing research

There is a real dearth of clinical research evidence concerning the effects of rehabilitation on intellectually disabled people. The knowledge gained will add to the research knowledge base. Further research is still needed and must focus on the effectiveness and efficacy of specific rehabilitation service types provided to people with intellectual disabilities in South Africa.

5.6 AIM

This study answered the review question. The evidence regarding the effects of rehabilitation on intellectually disabled people by means of a systematic literature review has been clearly captured and explained from the data extracted (refer to Table 4.1).

5.7 SUMMARY

This chapter covered an overview of the conclusion statements regarding the effects of rehabilitation on intellectually disabled people and the evaluation of rigour and provided a discussion of the limitations of the study. Recommendations for research,

recommendations for education and related to nursing practice were also provided. The chapter concludes with the statement that the aim of the study was reached.

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APPENDICES

APPENDIX A: CASP CHECKLISTS

Critical Appraisal Skills Programme (CASP)

Making sense of evidence

10 questions to help you make sense of reviews

How to use this appraisal tool

Three broad issues need to be considered when appraising the report of a systematic review:

- **Is the study valid?**
- **What are the results?**
- **Will the results help locally?**

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. You are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

The 10 questions are adapted from Oxman AD, Cook DJ, Guyatt GH, Users' guides to the medical literature. VI. How to use an overview. (JAMA 1994, 272(17):1367-1371)

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Screening questions

1. Did the review ask a clearly-focused question?

□ Yes □ Can't tell □ No

Consider if the question is 'focused' in terms of:

- *the population studied*
- *the intervention given or exposure*
- *the outcomes considered*

2. Did the review include the right type of study?

□ Yes □ Can't tell □ No

Consider if the included studies:

- *address the review's question*
- *have an appropriate study design*

Is it worth continuing?

Detailed questions

3. Did the reviewers try to identify all relevant studies?

□ Yes □ Can't tell □ No

Consider:

- *which bibliographic databases were used*
- *if there was follow-up from reference lists*
- *if there was personal contact with experts*
- *if the reviewers searched for unpublished studies*
- *if the reviewers searched for non-English-language studies*

4. Did the reviewers assess the quality of the included studies?

□ Yes □ Can't tell □ No

Consider:

- *if a clear, pre-determined strategy was used to determine which studies were included. Look for:*
- *a scoring system*
- *more than one assessor*

5. If the results of the studies have been combined, was it reasonable to do so?

□ Yes □ Can't tell □ No

Consider whether:

- *the results of each study are clearly displayed*
- *the results were similar from study to study (look for tests of heterogeneity)*

– *the reasons for any variations in results are discussed*

6. How are the results presented and what is the main result?

Consider:

– *how the results are expressed (e.g. odds ratio, relative risk, etc.)*
– *how large this size of result is and how meaningful it is*
– *how you would sum up the bottom-line result of the review in one sentence*

7. How precise are these results?

Consider:

– *if a confidence interval were reported. Would your decision about whether or not to use this intervention be the same at the upper confidence limit as at the lower confidence limit?*
- *if a p-value is reported where confidence intervals are unavailable*

8. Can the results be applied to the local population?

□Yes □Can't tell □No

Consider whether:

– *the population sample covered by the review could be different from your population in ways that would produce different results*
– *your local setting differs much from that of the review*
– *you can provide the same intervention in your setting*

9. Were all important outcomes considered?

□Yes □Can't tell □No

Consider outcomes from the point of view of the:

– *individual*
– *policy makers and professionals*
– *family/carers*
– *wider community*

10. Should policy or practice change as a result of the evidence contained in this review?

□Yes □Can't tell □No

Consider:

– *whether any benefit reported outweighs any harm and/or cost. If this information is not reported can it be filled in from elsewhere?*

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Critical Appraisal Skills Programme (CASP)

Making sense of evidence

10 questions to help you make sense of randomised controlled trials

How to use this appraisal tool

Three broad issues need to be considered when appraising the report of a randomised controlled trial:

- **Is the trial valid?**
- **What are the results?**
- **Will the results help locally?**

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is “yes”, it is worth proceeding with the remaining questions. You are asked to record a “yes”, “no” or “can’t tell” to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

The 10 questions are adapted from Guyatt GH, Sackett DL, and Cook DJ, Users’ guides to the medical literature. II. How to use an article about therapy or prevention. (*JAMA* 1993, 270(21):2598-2601 and *JAMA* 1994, 271(1):59-63).

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Screening questions

1. Did the study ask a clearly-focused question?

□ Yes □ Can't tell □ No

Consider if the question is 'focused' in terms of:

- *the population studied*
- *the intervention given*
- *the outcomes considered*

2. Was this a randomised controlled trial (RCT) and was it appropriately so?

□ Yes □ Can't tell □ No

Consider:

- *why this study was carried out as an RCT*
- *if this was the right research approach for the question being asked*

Is it worth continuing?

Detailed questions

3. Were participants appropriately allocated to intervention and control groups?

□ Yes □ Can't tell □ No

Consider:

- *how participants were allocated to intervention and control groups. Was the process truly random?*
- *whether the method of allocation was described. Was a method used to balance the randomization, e.g. stratification?*
- *how the randomization schedule was generated and how a participant was allocated to a study group*
- *if the groups were well balanced. Are any differences between the groups at entry to the trial reported?*
- *if there were differences reported that might have explained any outcome(s) (confounding)*

4. Were participants, staff and study personnel blind' to participants' study group?

□ Yes □ Can't tell □ No

Consider:

- *the fact that blinding is not always possible*
- *if every effort was made to achieve blinding*
- *if you think it matters in this study*
- *the fact that we are looking for 'observer bias'*

5. Were all of the participants who entered the trial accounted for at its conclusion?

□Yes □Can't tell □No

Consider:

- *if any intervention-group participants got a control-group option or vice versa*
- *if all participants were followed up in each study group (was there loss-to-follow-up?)*
- *if all the participants' outcomes were analysed by the groups to which they were originally allocated (intention-to-treat analysis)*
- *what additional information would you liked to have seen to make you feel better about this*

6. Were the participants in all groups followed up and data collected in the same way?

□Yes □Can't tell □No

Consider:

- *if, for example, they were reviewed at the same time intervals and if they received the same amount of attention from researchers and health workers. Any differences may introduce performance bias.*

7. Did the study have enough participants to minimise the play of chance?

□Yes □Can't tell □No

Consider:

- *if there is a power calculation. This will estimate how many participants are needed to be reasonably sure of finding something important (if it really exists and for a given level of uncertainty about the final result).*

8. How are the results presented and what is the main result?

Consider:

- *if, for example, the results are presented as a proportion of people experiencing an outcome, such as risks, or as a measurement, such as mean or median differences, or as survival curves and hazards*
- *how large this size of result is and how meaningful it is*
- *how you would sum up the bottom-line result of the trial in one sentence*

9. How precise are these results?

Consider:

- *if the result is precise enough to make a decision*
- *if a confidence interval were reported. Would your decision about whether or not to use this intervention be the same at the upper confidence limit as at the lower confidence limit?*

– *if a p-value is reported where confidence intervals are unavailable*

10. Were all important outcomes considered so the results can be applied?

□Yes □Can't tell □No

Consider whether:

– *the people included in the trail could be different from your population in ways that would produce different results*
– *your local setting differs much from that of the trial*
– *you can provide the same treatment in your setting*

Consider outcomes from the point of view of the:

– *individual*
– *policy maker and professionals*
– *family/carers*
– *wider community*

Consider whether:

– *any benefit reported outweighs any harm and/or cost. If this information is not reported can it be filled in from elsewhere?*
– *policy or practice should change as a result of the evidence contained in this trial*

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Critical Appraisal Skills Programme (CASP)

Making sense of evidence

10 questions to help you make sense of qualitative research

This assessment tool has been developed for those unfamiliar with qualitative research and its theoretical perspectives. This tool presents a number of questions that deal very broadly with some of the principles or assumptions that characterise qualitative research. It is *not a definitive guide* and extensive further reading is recommended.

How to use this appraisal tool

Three broad issues need to be considered when appraising the report of qualitative research:

- **Rigour: Has a thorough and appropriate approach been applied to key research methods in the study?**
- **Credibility: Are the findings well presented and meaningful?**
- **Relevance: How useful are the findings to you and your organisation?**

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

The 10 questions have been developed by the national CASP collaboration for qualitative methodologies.

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Screening questions

1. Was there a clear statement of the aims of the research?

□Yes □No

Consider:

- *what the goal of the research was*
- *why it is important*
- *its relevance*

2. Is a qualitative methodology appropriate?

□Yes □No

Consider:

- *if the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants*

Is it worth continuing?

Detailed questions

Appropriate research design

3. Was the research design appropriate to address the aims of the research?

Write comments here

Consider:

- *if the researcher has justified the research design (e.g. have they discussed how they decided which methods to use?)*

Sampling

4. Was the recruitment strategy appropriate to the aims of the research?

Write comments here

Consider:

- *if the researcher has explained how the participants were selected*
- *if they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study*
- *if there are any discussions around recruitment (e.g. why some people chose not to take part)*

Data collection

5. Were the data collected in a way that addressed the research issue?

Write comments here

Consider:

- *if the setting for data collection was justified*
- *if it is clear how data were collected (e.g. focus group, semi-structured interview etc)*

- *if the researcher has justified the methods chosen*
- *if the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews were conducted, did they used a topic guide?)*
- *if methods were modified during the study. If so, has the researcher explained how and why?*
- *if the form of data is clear (e.g. tape recordings, video material, notes etc)*
- *if the researcher has discussed saturation of data*

Reflexivity (research partnership relations/recognition of researcher bias)

6. Has the relationship between researcher and participants been adequately considered?

Write comments here

Consider whether it is clear:

- *if the researcher critically examined their own role, potential bias and influence during:*
- *formulation of research questions*
- *data collection, including sample recruitment and choice of location*
- *how the researcher responded to events during the study and whether they considered the implications of any changes in the research design*

Ethical issues

7. Have ethical issues been taken into consideration?

Write comments here

Consider:

- *if there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained*
- *if the researcher has discussed issues raised by the study (e. g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)*
- *if approval has been sought from the ethics committee*

Data analysis

8. Was the data analysis sufficiently rigorous?

Write comments here

Consider:

- *if there is an in-depth description of the analysis process*
- *if thematic analysis is used. If so, is it clear how the categories/themes were derived from the data?*
- *whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process*
- *if sufficient data are presented to support the findings*
- *to what extent contradictory data are taken into account*

– *whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation*

Findings

9. Is there a clear statement of findings?

Write comments here

Consider:

– *if the findings are explicit*
– *if there is adequate discussion of the evidence both for and against the researcher's arguments*
– *if the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst.)*
– *if the findings are discussed in relation to the original research questions*

Value of the research

10. How valuable is the research?

Write comments here

Consider:

– *if the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature?)*
– *if they identify new areas where research is necessary*
– *if the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used*

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APPENDIX B: ADA CHECKLISTS

Appendix 7: Evidence Abstract Worksheet Template

Citation:	
Study Design:	
Class:	Based on classes of evidence reports (Table 2.3)
Quality Rating:	+, Ø , - Based on Quality Criteria Checklist
Research Purpose:	
Inclusion Criteria:	
Exclusion Criteria:	
Description of Study Protocol:	**Recruitment** **Design** **Blinding used (if applicable)** **Intervention (if applicable)** **Statistical Analysis** **(These prompts assist you in determining which information to abstract from research article.)**
Data Collection Summary:	**Timing of Measurements** **Dependent Variables** • Variable 1: brief description (how measured?) • Variable 2: brief description (how measured?) • etc. **Independent Variables** **Control Variables**
Description of Actual Data Sample:	**Initial N:** (e.g., 731 (298 males, 433 females)) **Attrition (final N):** **Age:** **Ethnicity:** **Other relevant demographics:** **Anthropometrics** (e.g., were groups same or different on important measures) **Location:**
Summary of Results:	See table below
Author Conclusion:	
Review Comments:	*Italicize reviewer and expert panel comments.*
Funding Source	Determine the funding source: Government, Industry, University/Hospital , Not-for-Profit and/or Other.

Variables	Treatment Group Measures and confidence intervals	Control group Measures and confidence intervals	Statistical Significance of Group Difference
Dep var 1	Mean, CI. e.g., 4.5±2.2	Mean, CI. e.g., 1.5±2.0	Stat signif difference between groups e.g., p=.002
Dep var 2			
Etc.			
Other Findings			

Appendix 8: Quality Criteria Checklist: Primary Research

Symbols Used

\+ **Positive:** Indicates that the report has clearly addressed issues of inclusion/exclusion, bias, generalizability, and data collection and analysis.

-- **Negative:** Indicates that these issues have not been adequately addressed.

Ø **Neutral:** Indicates that the report is neither exceptionally strong nor exceptionally weak.

Quality Criteria Checklist: Primary Research

RELEVANCE QUESTIONS	
1. Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (NA for some Epi studies)	Yes No Unclear N/A
2. Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes No Unclear N/A
3. Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to dietetics practice?	Yes No Unclear N/A
4. Is the intervention or procedure feasible? (NA for some epidemiological studies)	Yes No Unclear N/A
If the answers to all of the above relevance questions are "Yes," the report is eligible for designation with a plus (+) on the Evidence Quality Worksheet, depending on answers to the following validity questions.	

VALIDITY QUESTIONS	
1. Was the research question clearly stated?	Yes No Unclear N/A
1.1 Was the specific intervention(s) or procedure (independent variable(s)) identified?	
1.2 Was the outcome(s) (dependent variable(s)) clearly indicated?	
1.3 Were the target population and setting specified?	
2. Was the selection of study subjects/patients free from bias?	Yes No Unclear N/A
2.1 Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	
2.2 Were criteria applied equally to all study groups?	
2.3 Were health, demographics, and other characteristics of subjects described?	
2.4 Were the subjects/patients a representative sample of the relevant population?	
3. Were study groups comparable?	Yes No Unclear N/A
3.1 Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	
3.2 Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	
3.3 Were concurrent controls used? (Concurrent preferred over historical controls.)	
3.4 If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	
3.5 If case control study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	
3.6 If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	
4. Was method of handling withdrawals described?	Yes No Unclear N/A
4.1 Were follow up methods described and the same for all groups?	
4.2 Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	
4.3 Were all enrolled subjects/patients (in the original sample) accounted for?	
4.4 Were reasons for withdrawals similar across groups?	

	4.5	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	
5.		**Was blinding used to prevent introduction of bias?**	Yes No Unclear N/A
	5.1	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	
	5.2	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	
	5.3	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	
	5.4	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	
	5.5	In diagnostic study, were test results blinded to patient history and other test results?	
6.		**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were intervening factors described?**	Yes No Unclear N/A
	6.1	In RCT or other intervention trial, were protocols described for all regimens studied?	
	6.2	n observational study, were interventions, study settings, and clinicians/provider described?	
	6.3	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	
	6.4	Was the amount of exposure and, if relevant, subject/patient compliance measured?	
	6.5	Were co-interventions (e.g., ancillary treatments, other therapies) described?	
	6.6	Were extra or unplanned treatments described?	
	6.7	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	
	6.8	In diagnostic study, were details of test administration and replication sufficient?	
7.		**Were outcomes clearly defined and the measurements valid and reliable?**	Yes No Unclear N/A
	7.1	Were primary and secondary endpoints described and relevant to the question?	
	7.2	Were nutrition measures appropriate to question and outcomes of concern?	
	7.3	Was the period of follow-up long enough for important outcome(s) to occur?	
	7.4	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	
	7.5	Was the measurement of effect at an appropriate level of precision?	
	7.6	Were other factors accounted for (measured) that could affect outcomes?	
	7.7	Were the measurements conducted consistently across groups?	
8.		**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes No Unclear N/A
	8.1	Were statistical analyses adequately described the results reported appropriately?	
	8.2	Were correct statistical tests used and assumptions of test not violated?	
	8.3	Were statistics reported with levels of significance and/or confidence intervals?	
	8.4	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	
	8.5	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	
	8.6	Was clinical significance as well as statistical significance reported?	
	8.7	If negative findings, was a power calculation reported to address type 2 error?	
9.		**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes No Unclear N/A
	9.1	Is there a discussion of findings?	
	9.2	Are biases and study limitations identified and discussed?	
10.		**Is bias due to study's funding or sponsorship unlikely?**	Yes No Unclear N/A
	10.1	Were sources of funding and investigators' affiliations described?	
	10.2	Was there no apparent conflict of interest?	

MINUS/NEGATIVE (-)

If most (six or more) of the answers to the above validity questions are "No," the report should be designated with a minus (-) symbol on the Evidence Worksheet.

NEUTRAL (∅) *If the answers to validity criteria questions 2, 3, 6, and 7 do not indicate that the study is exceptionally strong, the report should be designated with a neutral (∅) symbol on the Evidence Worksheet.*
PLUS/POSITIVE (+) *If most of the answers to the above validity questions are "Yes" (including criteria 2, 3, 6, 7 and at least one additional "Yes"), the report should be designated with a plus symbol (+) on the Evidence Worksheet.*

Appendix 9: Quality Criteria Checklist: Review Article

Symbols Used

\+ **Positive:** Indicates that the report has clearly addressed issues of inclusion/exclusion, bias, generalizability, and data collection and analysis.

-- **Negative:** Indicates that these issues have not been adequately addressed.

∅ **Neutral:** Indicates that the report is neither exceptionally strong nor exceptionally weak.

Quality Criteria Checklist: Review Articles

RELEVANCE QUESTIONS	
1. Will the answer if true, have a direct bearing on the health of patients?	Yes No Unclear N/A
2. Is the outcome or topic something that patients/clients/population groups would care about?	Yes No Unclear N/A
3. Is the problem addressed in the review one that is relevant to dietetics practice?	Yes No Unclear N/A
4. Will the information, if true, require a change in practice?	Yes No Unclear N/A
If the answers to all of the above relevance questions are "Yes," the report is eligible for designation with a plus (+) on the Evidence Quality Worksheet, depending on answers to the following validity questions.	

VALIDITY QUESTIONS	
1. Was the question for the review clearly focused and appropriate?	Yes No Unclear N/A
2. Was the search strategy used to locate relevant studies comprehensive? Were the databases searched and the search terms used described?	Yes No Unclear N/A
3. Were explicit methods used to select studies to include in the review? Were inclusion/exclusion criteria specified and appropriate? Were selection methods unbiased?	Yes No Unclear N/A
4. Was there an appraisal of the quality and validity of studies included in the review? Were appraisal methods specified, appropriate, and reproducible?	Yes No Unclear N/A
5. Were specific treatments/interventions/exposures described? Were treatments similar enough to be combined?	Yes No Unclear N/A
6. Was the outcome of interest clearly indicated? Were other potential harms and benefits considered?	Yes No Unclear N/A
7. Were processes for data abstraction, synthesis, and analysis described? Were they applied consistently across studies and groups? Was there appropriate use of qualitative and/or quantitative synthesis? Was variation in findings among studies analyzed? Were heterogeneity issued considered? If data from studies were aggregated for meta-analysis, was the procedure described?	Yes No Unclear N/A
8. Are the results clearly presented in narrative and/or quantitative terms? If summary statistics are used, are levels of significance and/or confidence intervals included?	Yes No Unclear N/A
9. Are conclusions supported by results with biases and limitations taken into consideration? Are limitations of the review identified and discussed?	Yes No Unclear N/A
10. Was bias due to the review's funding or sponsorship unlikely?	Yes No Unclear N/A
MINUS/NEGATIVE (-) *If most (six or more) of the answers to the above validity questions are "No," the review should be designated with a minus (-) symbol on the Evidence Quality Worksheet.*	
NEUTRAL (∅) *If the answer to any of the first four validity questions (1-4) is "No," but other criteria indicate strengths, the review should be designated with a neutral (∅) symbol on the Evidence Worksheet.*	
PLUS/POSITIVE (+) *If most of the answers to the above validity questions are "Yes" (must include criteria 1, 2, 3, and 4), the report should be designated with a plus symbol (+) on the Evidence Worksheet.*	

Appendix 10: Important Considerations from Checklist by Study Design

Study design type	Distinguishing characteristics of design	Most important considerations (from checklist)*
EXPERIMENTAL & QUASI-EXPERIMENTAL STUDIES	**(Investigator manipulated independent variable always control group)**	
Randomized controlled trial (Preferred for therapy and prevention questions)	investigators manipulates treatment/intervention (independent variable) randomization to groups	**3.1, 3.2, 4.3** 2.1, 2.3, 5.1, 5.2, 6.1, 6.3 – 6.7, 7.4
Nonrandomized trial (Frequently used for therapy and prevention questions)	investigators manipulates treatment/intervention (independent variable)	**2.1, 2.3, 3.1-3.3, 4.3** 5.1, 5.2, 6.1, 6.3 – 6.7, 7.1 – 7.7
OBSERVATIONAL STUDIES	**(Comparisons made)**	
Comparison of 2 or more groups (also called prospective cohort) (Preferred for etiology, causation, or harm questions)	comparison of existing "convenient" groups getting different interventions or exposures	**2.1, 2.2, 4.3, 4.4, 7.1, 7.3, 7.4, 7.6, 7.7, 8.5** 2.3, 3.2, 3.3, 5.2, 5.3, 6.2 – 6.7
Single group before-after or time series	subject serves as own control	**2.1, 2.3, 2.4, 6.2, 7.4, 7.6** 4.3, 5.1, 5.2, 6.3 – 6.7, 7.1 – 7.3, 7.5 3 - NA**
Sensitivity & specificity of diagnostic test (Preferred for diagnosis questions)	dichotomous (yes/no) outcome comparison with "gold standard"	**3g, 4e, 5e** 2.4, 6.8, 7.6
EPIDEMIOLOGICAL ANALYTIC STUDIES	**(Comparisons constructed analytically, groups created post hoc)**	
Cohort study (Preferred for natural history and prognosis questions)	membership based on defining characteristic or factor	**2.1, 4.3, 7.1, 7.3, 7.4, 7.6, 8.5** 2.3, 3.4, 5.3, 6.3
Case-control study (Preferred for etiology, causation, or harm questions)	"cases" with outcome identified then "matched" with non-cases (controls) from same population look back for exposure	**2.1, 3.5, 4.3, 7.3, 7.4 7.6, 7.7** 2.3, 5.4, 6.3, 6.4
Cross-sectional study (Preferred for diagnosis questions) (Used for etiologic, causation, or harm questions)	outcome (dependent variable) and exposure (independent variable) measured at same time	**4.3, 7.4, 7.6** 2.1, 2.3, 2.4, 3.4, 5.3, 6.8, 7.2, 7.4 – 7.6 3 - NA, if comparison groups are not constructed
DESCRIPTIVE STUDIES	**(No comparison)**	
Case series	describe process and outcomes prospectively, "natural history" with no intervention	**2.1, 4.3, 6.5, 6.6, 7.1, 7.4, 7.6** 2.3, 2.4, 5.2, 5.3, 7.2, 7.3 3 - NA

*See: *Quality Criteria Checklist*: Primary Research. **Bolded items are most important for study design.** The other (not bold) items are also common threats to validity in study type.

**NA = not applicable

APPENDIX C: JOHN HOPKINS CHECKLIST

Johns Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal

Evidence Level: _____

ARTICLE TITLE:	NUMBER:
AUTHOR(S):	DATE:
JOURNAL:	
SETTING:	SAMPLE (COMPOSITION/SIZE)

☒ Experimental	☐ Meta-analysis	☐ Quasi-experimental	☐ Non-experimental	☒ Qualitative	☐ Meta-synthesis

Does this study apply to the population targeted by my practice question?	☐ Yes	☐ No

If the answer is No, STOP here (unless there are similar characteristics).

Strength of Study Design		
• Was sample size adequate and appropriate?	☐ Yes	☒ No
• Were study participants randomized?	☐ Yes	☐ No
• Was there an intervention?	☐ Yes	☐ No
• Was there a control group?	☐ Yes	☐ No
• If there was more than one group, were groups equally treated, except for the intervention?	☐ Yes	☐ No
• Was there adequate description of the data collection methods?	☐ Yes	☐ No
Study Results		
• Were results clearly presented?	☐ Yes	☐ No
• Was an interpretation/analysis provided?	☐ Yes	☐ No
Study Conclusions		
• Were conclusions based on clearly presented results?	☐ Yes	☐ No
• Were study limitations identified and discussed?	☐ Yes	☐ No

PERTINENT STUDY FINDINGS AND RECOMMENDATIONS

Will the results help in caring for my patients?	☐ Yes	☐ No

Evidence Rating (scales on back)

Strength of Evidence			
Quality of Evidence (check one)	☐ High (A)	☐ Good (B)	☐ Low/Major flaw (C)

Johns Hopkins Nursing Evidence-Based Practice Research Evidence Appraisal

Strength of Evidence
Level I (Strong)

EXPERIMENTAL STUDY (RANDOMIZED CONTROLLED TRIAL OR RCT)

- Study participants (subjects) are randomly assigned to either a treatment (TX) or control (non-treatment) group
- May be:
  - Blind: subject does not know which TX subject is receiving
  - Double-blind: neither subject nor investigator knows which TX subject is receiving
  - Non-blind: both subject and investigator know which TX subject is receiving; used when it is felt that the knowledge of treatment is unimportant

META-ANALYSIS OF RCTS

- Quantitatively synthesizes and analyzes results of multiple primary studies addressing a similar research question
- Statistically pools results from independent but combinable studies
- Summary statistic (effect size) is expressed in terms of direction (positive, negative, or zero) and magnitude (high, medium, small)

Level II

QUASI-EXPERIMENTAL STUDY

- Always includes manipulation of an independent variable
- Lacks either random assignment or control group
- Findings must be considered in light of threats to validity (particularly selection)

Level III

NON-EXPERIMENTAL STUDY

- No manipulation of the independent variable
- Can be descriptive, comparative, or relational
- Often uses secondary data
- Findings must be considered in light of threats to validity (particularly selection, lack of severity or co-morbidity adjustment)

QUALITATIVE STUDY

- Explorative in nature, such as interviews, observations, or focus groups
- Starting point for studies of questions for which little research currently exists
- Sample sizes are usually small and study results are used to design stronger studies that are more objective and quantifiable

META-SYNTHESIS

- Research technique that critically analyzes and synthesizes findings from qualitative research
- Identifies key concepts and metaphors and determines their relationships to each other
- Aim is not to produce a summary statistic, but rather to interpret and translate findings

Quality of Evidence (Scientific Evidence)

A High: consistent results, sufficient sample size, adequate control, and definitive conclusions; consistent recommendations based on extensive literature review that includes thoughtful reference to scientific evidence

B Good: reasonably consistent results, sufficient sample size, some control, and fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence

C Low/Major flaw: little evidence with inconsistent results, insufficient sample size, conclusions cannot be drawn

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