

## HIV/AIDS management: The roles of physiotherapy

Munishi, M (BSc. Hon)

Frantz, J. M (PhD)

Struthers, P (PhD)

**Correspondence Address;**

M Munishi  
Department of Physiotherapy,  
Morogoro Regional Hospital  
P. Box 435  
Morogoro, Tanzania  
E-mail: marcmuni@yahoo.com

**Abstract**

**Background:**

HIV/AIDS is a major health problem that has affected many people globally and it is the primary cause of death in Sub-Saharan Africa. Approximately 68% of the global total i.e. 22.5 million people living with HIV/AIDS (PLWHA) are in Sub-Saharan Africa. With antiretroviral therapy, PLWHA now live longer and present with various opportunistic neuro-musculo-skeletal and cardio-pulmonary conditions.

**Purpose:**

To explore the global, regional and local existing literature concerning knowledge, attitude and roles of physiotherapy in the management of PLWHA.

**Method:**

A retrospective search of articles published between January 1990 and March 2008. Outcome measures: Documented information concerning physiotherapy management of PLWHA, including physiotherapists' knowledge and attitudes, based on inclusion criteria.

**Results:**

The search yielded 17 reviews of good or reasonable quality. Physiotherapy rehabilitation can address impairment and activity limitation. There is some evidence that aerobic training with a progressive exercise component is effective in improving the cardio-vascular system, distribution of adipose tissue and on quality of life. There is evidence that ice or dry-towel massage has a positive effect on neuropathic pain. Evidence from case studies suggests that joint mobilization, soft tissue mobilization, stretching, and the use of micro-current, pressure garments and orthotics may be effective. There was no evidence of the effect of other physiotherapy roles mentioned including chest physiotherapy, counseling and health education.

**Conclusion:**

There is some evidence that exercise is safe and beneficial to PLWHA. Further studies are needed to determine if other physiotherapy techniques are effective for treating PLWHA.

**Key words:**

Physiotherapy management, HIV/AIDS, physiotherapy challenges, conditions related to physiotherapy, physiotherapy treatment techniques, therapeutic exercises

## Introduction

HIV/AIDS is a leading cause of deaths globally and remains the primary cause of death in Africa (UNAIDS, 2007). In 2007, 33.2 million people were estimated to be living with HIV, 2.5 million people became newly infected and 2.1 million people died of AIDS (UNAIDS & WHO, 2007). The African region remains the most severely affected region globally and it was estimated that there was 1.7 million new HIV infections in sub-Saharan Africa in 2007. An estimated 22.5 million people living with HIV, or 68% of the global total, are in sub-Saharan Africa (UNAIDS & WHO, 2007).

As a result of medical advancement, many people living with HIV infection in developed countries are living longer since the introduction of antiretroviral drugs (Worthington, Myers, O'Brien, Nixon, Cockerill, & Bereket, 2008). With these changes the needs of people living with HIV/AIDS (PLWHA) have changed and their rehabilitation needs have increased and have become more complex (Worthington et al. 2008). PLWHA face a variety of health-related consequences and the adverse effects of associated treatment. According to Worthington et al. (2008) and Anandan, Braveman, Kielhofner and Forsyth (2006), both asymptomatic and symptomatic PLWHA experience higher levels of perceived physical disability compared to the general population. In the study by Anandan et al (2006) 80% of PLWHA surveyed, experienced one impairment (such as pain or weakness), activity limitation (such as inability to walk), or participation restriction (such as inability to work) attributed to their HIV status. As HIV infection now increasingly presents as a chronic disease, there is a potential increase in the prevalence and impact of disability (WHO, 2001; Anandan, et al, 2006). Consequently the rehabilitation of PLWHA needs to include the management of impairment, activity limitations and participation restrictions.

According to Uys (2003), managing PLWHA and the related impairments requires a continuum of care for the individual and the family. In addition, a variety of medical staff play a role in the management and prevention of HIV/AIDS. Due to the presumed dangers of HIV infection during patient care, medical staff may experience stress when caring for PLWHA. Additionally, it has been emphasized that adequate knowledge and a

positive attitude is critical when caring for PLWHA (Gatsi, Amosun and Mhlanga, 1994; Johnson and Sim 1998). Adequate knowledge is an important means of reducing stress and can result in better care and improved information being given to the general public (Hall & Shisana, 2003; Horsman & Sheeran, 1995; WHO, 2005).

A large body of knowledge exists on the medical management of HIV/AIDS but the role of rehabilitation workers in the management of HIV/AIDS is not always clearly defined. Different skills and competencies may be needed by rehabilitation workers when managing PLWHA. Health professionals including physiotherapists must have adequate knowledge about HIV/AIDS and the appropriate techniques available to treat PLWHA.

Physiotherapy is a branch of science which offers a service to people to maintain and restore maximum movement and functional ability throughout the life span (WCPT, 2003). Within the medical team, physiotherapy play important roles in reducing pain and restoring (or maintaining) optimal physical function of patients. In addition, physiotherapy also utilizes non pharmacological treatment modalities, including manual therapies, electro-physical agents, thermotherapy, hydrotherapy and graded exercises (Jose & Balan, 2002; Fransen, 2004; Miller, 2007). Physiotherapists can be involved in the management of PLWHA who have opportunistic infections or other complications (WHO, 2001; Gale, 2003; Worthington, Myers, O'Brien, Nixon, Cockerill & Bereket, 2005). According to Voors (2000), based on the ethical principles of beneficence, non-maleficence and justice, physiotherapists do not have the right to refuse to treat PLWHA. Thus, as the health care is not value free, the role of therapists is not to judge but to treat according to the patients' needs rather than merit.

Findings from a few studies done to investigate the role of physiotherapists in the management of PLWHA and associated conditions show positive effects especially in decreasing signs and symptoms and improving functional limitations, and quality of life (Gale, 2003; Myezwa, Stewart, Mbambo & Nesara, 2007; Galantino, Marchese, Ness & Gilchrist, 2005). Van Rie, Mupuala and Dow (2008), reported that HIV/AIDS in children definitely

impacted on their neuromotor development thus indicating a need for physiotherapy intervention. In addition, the study by Lang (1993) highlights that PLWHA have problems that can be managed by physiotherapy and those patients who have been discharged from hospital will benefit from home visits by physiotherapists thus highlighting the need for community physiotherapy.

As patients are experiencing acute and chronic symptoms, it is evident that physiotherapists have a role to play in the acute hospital setting as well as in community rehabilitation settings. Hughes, Jelsma, Maclean, Darder and Tinise (2004, p. 375) concluded that "therapists need to re-examine and redefine their roles" in the management of PLWHA especially in poorly resourced regions with a high prevalence of HIV/AIDS.

This systematic literature review aims to determine, firstly, the knowledge and attitude of physiotherapists towards managing PLWHA, and, secondly, the roles of physiotherapy in the management of PLWHA and the conditions associated with HIV/AIDS. The review will primarily aim to consolidate information in the existing literature about physiotherapy management of PLWHA.

### **Methodology**

This review investigated publications that evaluated or discussed the knowledge and the attitudes of physiotherapists towards managing PLWHA and the effect of treatment provided by physiotherapists. It is based on information obtained from the following electronic databases for the period from January 1990 to March 2008: Medline, CINAHL, Science Direct, Google Scholar, Health Source Nursing Academic Edition, PEDro, Cochrane, British Library Direct, EMBASE and Aidsonline. Published abstracts and proceedings from major international and national HIV/AIDS conferences were retrieved and reviewed.

The key words and the search terms used to develop the search strategy for each of these databases included: knowledge, attitude, physiotherapy management, HIV/AIDS, physiotherapy challenges, conditions related to physiotherapy, physiotherapy treatment modalities, physical therapy modalities, aerobic exercises,

therapeutic exercises, physical therapy management and rehabilitation. The electronic searches were supplemented by checking the reference lists of any relevant identified articles. Potentially relevant articles were retrieved for full text assessment when the title and abstract did not provide sufficient information to include or exclude in the review. The quality of the articles included in the review was assessed using different scales. Final scoring of the articles was done by two independent reviewers.

The Reader Critical Appraisal Method (Mac Auley, Mc Crum & Brown, 1998) is a scale which can be used to score an article with any study design. In this case, it was used to score the cross-sectional survey studies. The score ranged from 1-25 points, the higher the score the better the quality of the article. A "good quality" article scored between 17-25 points, a "moderate quality" article scored between 9-16 points and a "poor quality" article scored between 1-8 points. The articles that scored from 1-8 were excluded from the review.

The Centre for Evidence-Based Social Services Critical Thinking Tool (Guyatt, Sackett & Cook, 1994) was used for scoring the randomized control trials (RCTs), qualitative studies and quasi-experimental studies. The scale was comprised of 13 questions to assess the methodological quality of RCTs by use of criteria such as randomization, blinding, dropouts and follow ups, number of participants or sample and results. The score ranged from 1-13 points. Articles were only included in the final study if they were deemed to be of "good quality" (8-13 points) and "reasonable quality" (5-7 points). Those with 1-4 points were considered to be of poor quality and were excluded. The same tool was used for the scoring of qualitative studies.

The Critical Appraisal Skills Programme (CASP) (Oxman, Cook & Guyatt, 1994) was used to score the systematic review papers. This tool was comprised of 10 questions, thus the scores ranged from 1-10 points. The articles were considered of "good quality" (8-10 points) and "reasonable quality" (5-7 points). Those articles scored between 1-4 points were considered of poor quality and were excluded from the review.

The Critical Appraisal Skills Programme (CASP) (Public Health Resource Unit England, 2006) was used in the scoring of case control studies. The tool has 11 questions making a total number of 11 points. The articles were considered of "good quality" (8-11 points) and "reasonable quality" (5-7 points). Those with 1-4 points were considered of poor quality and were excluded from the review.

### **Results**

The initial search strategy of articles yielded 1855 articles. After the application of inclusion and exclusion criteria, 21 English language articles published between 1990 to March 2008 were selected. Four of these articles were subsequently left out because of poor quality or not being specific to the topic (i.e. physiotherapy and HIV/AIDS). Thus 17 articles from different study designs remained for review: six cross-sectional surveys, two randomized control trials, one qualitative study, three systematic reviews, four case studies and one quasi experimental study. These articles and the scores allocated to each article are presented in Table 1.

### **Discussion**

The findings of the articles identified for this review relate to the roles of the physiotherapists, their knowledge and attitudes, training of physiotherapists, and service provision by physiotherapists related to PLWHA.

#### **Roles of the physiotherapists**

Worthington et al., (2008) describes the role of physiotherapy as being to address impairment and activity limitation with 46% of rehabilitation workers in their study indicating that their profession was very important in the rehabilitation of PLWHA. The findings of a qualitative study (Worthington et al., 2005) with 13 key informants, including PLWHA, indicated that concepts of rehabilitation that used a goal-oriented and client centred process had the potential to have an impact on a range of life domains. This has led to the development in Canada of the HIV rehabilitation framework.

The role of physiotherapy that appeared most frequently in the studies is the provision of exercise therapy. Three systematic reviews related to exercise for PLWHA were included. Malita, Karelis, Toma, Rabasa-Lhoret (2005) reviewed 11 studies

investigating the relationship between exercise training and body composition and the patterns of body fat distribution. Aerobic training led to a reduction in total body fat and visceral fat, but the results of resistance training were inconclusive. They concluded that a combination of aerobic training and resisted exercise was more effective in the reduction of body fat and increasing lean body mass in HIV than in exercise alone and recommended a combination of aerobic and resistance training to be prescribed alongside medication. Taylor, Dodd, Shields and Bruder (2007) reviewed 38 studies, including 3 systematic reviews, and concluded that, although therapeutic exercise does benefit people across a broad physiotherapy practice, there was limited evidence that strength training leads to an increase in body weight in adults with HIV and that there was limited evidence that aerobic exercise leads to reduced HIV related symptoms. O'Brian, Nixon, Glazier, & Tinan (2004) reviewed seven studies concluding that progressive resisted exercise (PRE) is safe and may be beneficial to PLWHA. They recommended that further studies, conducted at various stages of the illness, are necessary.

A randomized controlled trial on adult men with HIV, by Fillipas, Oldmeadow, Bailey, & Cherry (2006) in Australia, comparing a supervised aerobic and resistance exercise programme with an unsupervised walking programme, found that the exercise group experienced a significant improvement in self-efficacy ( $p < 0.001$ ), cardiovascular fitness using the Kasch Pulse Recovery Test ( $p < 0.001$ ), and in two out of 11 dimensions using the QOL Medical Outcomes HIV Health Survey ( $p, 0.05$ ). Likewise, Mutimura, Stewart, Crowther, Yarasheski and Cade (2008), in a randomized control trial conducted in Rwanda, found exercise improved quality of life of adult men and women with HIV related to psychological, independence and social domains, compared to a control group. Cardiovascular fitness also improved. The researchers recommended that exercise training be included in the routine management of people receiving HAART, to improve adherence to the medications.

A case study by Miller (2007) reports on the use of a 12 week hospital based exercise programme with two girls with HIV aged 10 and 17 years. The

outcome indicated that progressive resisted exercise with an aerobic component improved muscle strength and reduced adipose tissue. These improvements were sustained or improved over the following six months with a home programme. A case study by Harris-Love and Shrader (2004) found that therapeutic exercise, in combination with compression bandaging and pressure garments, reduced the swelling and pain in an adult male with HIV with lymphoedema. They also found that gait training with the use of orthotic sandals improved mobility in a second adult male with HIV.

Other roles of physiotherapists reported in the studies identified include chest physiotherapy, counseling and health education (Useh, Akimpelu & Makinde, 2003). A study by Ownby (2006) investigated the effect of massage on neuropathic pain and quality of sleep among PLWHA with each person serving as his or her own control. Ice massage and dry towel massage both led to a reduction in neuropathic pain, with no significant difference between the two methods. There was no significant association with sleep quality.

Gale (2003) reports on a case study of two patients with AIDS related peripheral neuropathy concluding that the use of joint mobilization, soft tissue mobilization, stretching and the use of micro-current were effective in the relief of pain, improved function and quality of life.

### **Knowledge and attitudes of physiotherapists**

Several studies report on the knowledge and attitudes of physiotherapists as these may impact on their roles as service providers. Amongst student and qualified physiotherapists, level of knowledge has been positively associated with knowingly treating PLWHA (Worthington et al., 2008; Useh et al., 2003). However, it has been found that level of knowledge varies, with physiotherapists sometimes overestimating their knowledge (Puckree, 2002).

Although some physiotherapists indicate their knowledge is adequate (Gatsi et al., 1994), rehabilitation professionals in Canada, including physiotherapists, have indicated the need for more information on policy, treatment medications, the episodic course of HIV, HIV pathogenesis and HIV epidemiology (Worthington et al., 2008). In the study

by Puckree (2004) the majority of student senior physiotherapists did not know they could contract HIV from a used hyperdermic needle and did not know of mother-to-child transmission of HIV.

Attitudes towards PLWHA vary. Gatsi (1994) reports that 100% of physiotherapists in Zimbabwe indicated that they would treat PLWHA, but that only 74.8% would agree to give this person hydrotherapy. Fear is a factor for many physiotherapists working in countries where HIV prevalence is very high. Gatsi (1994) found that 54.6% of physiotherapists in Zimbabwe were afraid of becoming infected while treating PLWHA. Similarly Puckree (2002) found that 62% of physiotherapists (of a South African sample) were not completely at ease in treating PLWHA. In Canada where HIV prevalence is lower, 61% of rehabilitation workers indicated that they had never knowingly served a PLWHA (Worthington et al., 2008). Of these, 27% said they were unwilling and 46% unsure about whether they would treat PLWHA. In the study by Johnson and Sim (1998), where the majority of student physiotherapists demonstrated a moderately positive attitude towards PLWHA, 14% had moderately negative attitudes. Likewise, Puckree (2004) indicates that 33% of student physiotherapists reported negative attitudes.

The correlation between knowledge and attitude is inconclusive with Johnson and Sim (1998) reporting a significant relationship between high level of knowledge and positive attitude but Gatsi (1994) indicating that level of knowledge was not correlated with attitude. Nevertheless Gatsi (1994) concludes that improved knowledge is important to provide effective treatment, while Johnson and Sim (1998) conclude that poor knowledge and negative attitude would have a negative impact on the standard of care of the patient.

Training to improve the knowledge of student and graduate physiotherapists is reported on in several studies (Puckree, 2002; Useh et al., 2003; Worthington et al., 2008). Changes in curricula at undergraduate level is recommended (Puckree, 2004), though there is recognition that the curricula and the focus on HIV will vary according to area and prevalence of HIV (Useh et al., 2003). While some recommend that specialized training is

necessary for rehabilitation professionals providing rehabilitation services to PLWHA, others recognize the service needs the same skills as for other chronic or acute conditions (Worthington et al., 2008).

### Service provision by physiotherapists

Barriers related to service delivery were identified in several studies. Worthington et al., (2005, 2008) indicate that these include waiting lists, underfunding, stigma, fear of health care providers, and a lack of services in the rural areas. Myezwa et al. (2007) found very poor referral to physiotherapy. At one large hospital in South Africa, 98% of patients, with conditions that can be treated by physiotherapy, were not referred to physiotherapy.

### Conclusion

The role of physiotherapists in the provision of exercise therapy has been investigated in a number of studies and several systematic reviews, however, the conclusions vary. Aerobic exercise appears to reduce body fat, improve cardiovascular fitness and improve quality of life. Although exercise therapy has been found to be beneficial generally in physiotherapy practice, it is not certain that resisted exercises, although safe, will have beneficial effects among PLWHA. Other techniques have not been investigated in the same depth and further studies are needed. Training to improve the knowledge of HIV of students and graduates may not directly affect attitudes but will be important for providing an effective service.

### References

Anandan, N., Braveman, B., Kielhofner, G., & Forsyth, K. (2006). Impairments and perceived competence persons living with HIV/AIDS. *Work*, 27 (3), 255-266.

Centre for Evidence-Based Social Services. Critical Thinking Tool. Qualitative research. Milton Keynes Primary Care Trust 2002. Retrieved from [www.ripfa.org.uk/aboutus/archive/files/tools/Qualitative%20tool.doc](http://www.ripfa.org.uk/aboutus/archive/files/tools/Qualitative%20tool.doc)

Critical Appraisal Skills Programme (CASP), making sense of evidence (2006). Case control study. Retrieved from; [http://www.chsrf.ca/kte\\_docs/casp\\_case.control\\_tool.pdf](http://www.chsrf.ca/kte_docs/casp_case.control_tool.pdf)

Fillipas, S., Oldmeadow, L. B., Bailey, M. J., & Cherry, C. L. (2006). A six month, supervised, aerobic and resistance exercise program improves self-efficacy in

people with human immunodeficiency virus: A randomized controlled trial. *Australian Journal of Physiotherapy*, 52, 185-190.

Fransen, M. (2004). When is physiotherapy appropriate? *Best Practice & Research Clinical Rheumatology*. 18 (4), 477-489.

Galantino, L.M., Marchese, V., Ness, K., & Gilchrist, S.L. (2005). Oncology physical Therapy research: A need for collaboration and the quest for quality of life in cancer survivors. *Rehabilitation Oncology*, 23(3), 10-16.

Gale, J. (2003). Physiotherapy intervention in two people with HIV or AIDS-related Peripheral neuropathy. *Physiotherapy Research International*, 8 (4), 200-207.

Gatsi, L. T., Amosun, S. L., & Mhlanga, F. L. (1994). Rehabilitation personnel and AIDS in Zimbabwe: Knowledge, attitude and professional behaviour, *Physiotherapy Theory and Practice*, 10 (2), 95 - 102.

Guyatt, G. H., Sackett, D. L., & Cook, D. J. (1994). User's guides to the medical literature. II. How to use an article about therapy or prevention. *JAMA*, 271 (1), 59-63.

Hall, E., & Shisana, O. (2003). The impact of HIV/AIDS on health workers employed in the health sector. Cape Town: Human Sciences Research Council.

Harris-Love, M. O., & Shrader J. A. (2004). Physiotherapy management of patients with HIV-associated Kaposi's sarcoma. *Physiotherapy Research International*, 9 (4), 174-181.

Horsman, J. M., & Sheeran, P. (1995). Health care workers and HIV/AIDS: a critical review of the literature, *Social Science and Medicine*, 41, 1535-1567.

Hughes, J., Jelsma, J., Maclean, E., Darder, M., & Tinise, X. (2004). The health-related quality of life of people living with HIV/AIDS. *Disability and Rehabilitation*, 26 (6), 371-376.

Johnson, C., & Sim, J. (1998). AIDS and HIV: A comparative study of therapy students' knowledge and attitudes. *Physiotherapy*, 84 (1), 37 - 46.

Jose, J., & Balan, B. (2002). Physiotherapy and HIV/AIDS - Adding life to years. *International Conference on AIDS*, 14, July, 7-12.

Kane, K. (2006). Effects of ice massage on neuropathic pain in persons with AIDS. *Journal of the Association of Nurses in AIDS Care*, 17 (5), 15-22.

Kopacz, D. R., Grossman, L. S., & Klamen, D. L. (1999). Medical students and AIDS: Knowledge, attitudes and implications for education. *Health Education Research. Theory and Practice*, 14 (1), 1-6.

Lang, C. (1993). Community physiotherapy for people with HIV/AIDS. *Physiotherapy*: 79 (3), 163 - 167.

- MacAuley, D., Mc Crum, E., Brown, C. (1998). Randomized control of the READER method of critical appraisal in general practice. *British Medical Journal*, vol. 316 No 7138, pp.1134-7.
- Malita, F. M., Karelis, A. D., Toma, E., & Rabasa-Lhoret, R. (2005). Effects of different types of exercise on body composition and fat distribution in HIV-infected patients: A brief review. *Can. J. Appl. Physiol.* 30 (2), 233 - 245.
- Miller, T. L. (2007). Hospital -Based Exercise Program to Improve Body Composition, Strength, and Abdominal Adiposity in 2 HIV-Infected Children. *The AIDS Reader* 17.9 (September 1, 2007): 450.
- Mutimura, E., Stewart, A., Crowther, N. J., Yarasheski, K. E., & Cade, W. T. (2008). The effects of exercise training on quality of life in HAART- related HIV-positive Rwandan subjects with body fat redistribution. *Qual Life Res*, 17, 377 - 385.
- Myezwa, H., Stewart, A., Mbambo, N., & Nesara, P. (2007). Status of referral to physiotherapy among HIV positive patients at Chris Hani Baragwaneth Hospital, Johannesburg, South Africa, 2005. *South Africa Journal of Physiotherapy.* 63(2), 27-31.
- O'Brien, K., Nixon, S., Glazier, R. H., & Tinan, A. M. (2004). Progressive resistive exercise interventions for the adults living with HIV/AIDS. *Cochrane Database of Systematic Reviews*, 18 (4), 6. Retrieved from: <http://www.cochrane.org/reviews/en/ab004248.html>
- Oxman, A. D., Cook, D. J., & Guyatt, G. H. (1994). Users' guides to the medical literature. IV. How to use an overview. *JAMA*, 272 (17), 1367 - 1371.
- Puckree, T., Chetty, B. J., Govender, V., Ramparsad, S., & Lin, J. (2004). Are physiotherapy graduates adequately prepared to manage HIV/AIDS patients? *South African Journal of Physiotherapy*, 60 (2), 9-11.
- Puckree, T., Kasiram, R., Moodley, M., Singh, R. M., & Lin, J. (2002). Physiotherapists and human immunodeficiency virus/acquired immune deficiency syndrome: knowledge and prevention: A study in Durban, South Africa. *International Journal of Rehabilitation Research.* 25, 231-234.
- Taylor, N. F., Dodd, K. J., Shields, N., & Bruder, A. (2007). Therapeutic exercise in physiotherapy practice is beneficial: A summary of systematic reviews 2002-2005. *Australian Journal of Physiotherapy*, 53, 7-16.
- UNAIDS (2005). HIV/AIDS and Other Infectious Diseases. Retrieved March 31, 2008, from [http://www.unaids.org/epi/2005/doc/EPIupdate2005\\_pdf\\_en/epi-update2005\\_en.pdf](http://www.unaids.org/epi/2005/doc/EPIupdate2005_pdf_en/epi-update2005_en.pdf)
- UNAIDS & WHO (2007). Comparing adult antenatal-clinic based HIV prevalence with prevalence from national population based surveys in sub-Saharan Africa. UNAIDS presentation. Retrieved on 17 November 2007 from: [http://data.unaids.org/pub/Presentation/2007/survey\\_anc\\_2007\\_en.pdf](http://data.unaids.org/pub/Presentation/2007/survey_anc_2007_en.pdf).
- Useh, U., Akinpelu, A. O., & Makinde, G. B. (2003). HIV/AIDS pandemic comparative knowledge and roles of physiotherapists in two African countries. *Physiotherapy*, 89 (12), 720-727.
- Uys, L. (2003). Aspects of the care of people with HIV/AIDS in South Africa. *Public Health Nursing.* 20 (4), 271-280.
- Van Rie, A., Mupuala, A., & Dow, A. (2008). Impact of the HIV/AIDS Epidemic on the Neurodevelopment of Preschool- Aged Children in Kinshasa, Democratic Republic of the Congo. *American Academy of Paediatrics*; 122, 123-128. Also available on <http://www.pediatrics.org/cgi/content/full/122/1/e123>.
- Voors, M. (2000). HIV/AIDS, Duty to Treat, *Physiotherapy*, 86 (12), 640-644.
- World Confederation for Physical Therapy (2003). Evidence-Based Practice: Position Statement Approval. The 15th World Confederation for Physical Therapy General Meeting. London. World Confederation for Physical Therapy Publication.
- World Health Organisation (WHO) (2005). Prevention and treatment of HIV-related infections World Health Organisation. Retrieved August 14, 2009, from <http://www.who.int/hiv/topics/opportunistic/infections/en/index.html>.
- World Health Organisation (WHO) (2001). International Classification of Functioning, Disability, and Health. Geneva: WHO.
- Worthington, C., Myers, T., O'Brien, K., Nixon, S., Cockerill, R., & Bereket, T. (2005). Rehabilitation in HIV/AIDS: Development of an expanded conceptual framework. *Aids patients Care and STDS*, 19 (4), 258 - 271.
- Worthington, C., Myers, T., O'Brien, K., Nixon, S., Cockerill, R., & Bereket, T. (2008). Rehabilitation professionals and human immunodeficiency virus care: Results of a Canadian survey. *Arch Phys Med Rehabil*, 89, 105-113.

An analysis in terms of author, objective of the study, sampling technique, size and the setting where the study was conducted, study design, findings of the specific studies and their scores are presented in Table 1.

**Table 1: Summary of articles selected for review**

Reference	Objective	Design	Setting & sample attribute	Major findings	Score
Gatsi et al., (1994)	Assessing the attitudes and behaviour of physiotherapists working with PLWHA	Cross-sectional survey	Convenient sample of 119 rehabilitation personnel in Zimbabwe, ages not specified	Physiotherapists working in countries where HIV prevalence is very high like Zimbabwe, were afraid of becoming infected while treating PLWHA	23/25
Johnson and Sim, (1998)	Describe the knowledge and attitude of physiotherapy and occupational therapy students in relation to HIV and AIDS.	Cross-sectional survey	Convenient sample of 246 physiotherapy and occupational therapy students in UK, ages not specified	Good knowledge correlated with positive attitude.	22/25
Puckree et al., (2002)	Determine knowledge and attitude of physiotherapy learners concerning HIV/AIDS	Cross-sectional survey	Convenient sample of 114 physiotherapists in South Africa, ages not specified	Level of knowledge varies, with physiotherapists sometimes overestimating their knowledge	16/25
Puckree et al., (2004)	Determine the attitudes of student physiotherapists towards PLWHA	Cross-sectional survey	Convenient sample of senior 289 physiotherapy students in South Africa, aged up to 25 years	Knowledge varied with some important gaps	22/25
Useh et al., (2003)	Compare the level of knowledge, roles and attitudes of physiotherapists to PLWHA	Cross-sectional survey	Convenient sample of 207 physiotherapists in Zimbabwe and Nigeria, ages not specified	Good level of knowledge correlated with positive attitudes. Physiotherapist's roles include: chest physiotherapy, counseling and health education, exercise	22/25
Worthington et al, (2008)	Describe the role of physiotherapy and importance of rehabilitation professionals' practices, knowledge and training for PLWHA	Cross-sectional survey	Random sample of 2105 rehabilitation team members in Canada, ages not specified	Good level of knowledge correlated with positive attitudes. Rehabilitation by physiotherapist to address impairment and activity limitation.	21/25
Fillipas et al, (2006)	Effects of a supervised aerobic and resistance exercise programme in improving self-efficacy for PLWHA	Randomized control trial	Random sample of 40 adult male PLWHA aged 18 & above in Australia	There is a significant improvement in self-efficacy with supervised aerobic and resistance exercise programme to PLWHA	11/13
Mutumura et al, (2008)	Determine effects of exercise on quality of life of adult men and women with HIV	Randomized control trial	Random sample of 40 PLWHA in Rwanda, ages not specified	Exercise helps to improve cardiovascular fitness and self-esteem	12/13

Worthington et al, (2005)	Describe the concept of rehabilitation and its impact on QOL of PLWHA	Qualitative study	Interviews with 13 rehabilitation workers and PLWHA in Canada, ages not specified	Rehabilitation that uses a goal-oriented and client centred process has an impact on life domains	9/10
O'Brien et al, (2004)	Determine the effects of progressive resisted exercise on PLWHA	Systematic review	Review of 7 studies	Progressive resisted exercise is safe and may be beneficial to PLWHA	8.5/10
Malita et al, (2005)	Determine the effects of exercise training on body composition and body fat distribution	Systematic review	Review of 11 studies	A combination of aerobic training and resisted exercise was effective in the reduction of body fat and increasing lean body mass in PLWHA	9/10
Taylor et al, (2007)	Determine the effects of strength training in reducing HIV related symptoms for PLWHA	Systematic review	Review of 38 studies	There is limited evidence that strength training leads to an increase in body weight for PLWHA or aerobic exercise leads to reduced HIV related symptoms	9.5/10
Gale, (2003)	Describe the effect of physiotherapy interventions on AIDS related peripheral neuropathy	Case study	Convenient sample of two male patients aged 37 & 52 years in USA	The use of joint mobilization, soft tissue mobilization, stretching and the use of microcurrent were effective in the relief of pain, improved function and quality of life of PLWHA with peripheral neuropathy	9/11
Harris-Love et al, (2004)	Describe the effect of physiotherapy in the treatment of HIV-associated Kaposi's sarcoma	Case study	Convenient sample of two male patients aged 36 & 39 years in USA	Therapeutic exercise, in combination with compression bandaging and pressure garments, helps to reduce swelling and pain in an adult male with HIV with lymphoedema. Gait training and orthotic devices improved mobility	9/11
Myezwa et al, (2007)	Describe how and when physiotherapy is involved in the management of PLWHA	Retrospective study	Convenient sample of 732 records of PLWHA aged 15-72 years in South Africa	A very large proportion of patients who could benefit from physiotherapy were not referred to physiotherapy	10.5/11
Miller, (2007)	Describe the effect of a 12 week hospital based exercise programme on muscle strength and adipose tissue	Case study	Convenient sample of two girls aged 10 and 17 years in USA	Progressive resisted exercise with an aerobic component helps to improve muscle strength and reduce adipose tissue	9.5/11
Ownby, (2006)	Determine the effect of massage on neuropathic pain and sleep quality	Quasi experimental	Convenient sample of 34 adult PLWHA recovering from substance abuse aged 21-51years	Ice and dry towel massage decreases neuropathic pain but is not associated with sleep quality	8.5/13