

Sleep Quality and Habits of Adults with the Human Immunodeficiency Virus

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Abstract

The negative effects of sleep disturbances have been well documented in the general population and research shows individuals with the Human Immunodeficiency Virus (HIV) are particularly vulnerable to sleep difficulties. The medical and life quality issues effecting this population indicate the importance of characterizing the nature of these difficulties in terms of both sleep quality and quantity. With the extended life expectancies of HIV-positive persons, management of problems such as sleep disturbance is a vital aspect of improving quality of life. This study examined the sleep habits of persons living with HIV to determine sleep quality and identify possible targets for intervention. Results indicated that HIV-positive persons suffer diminished quality of sleep, high levels of insomnia, and high levels of nocturnal awakenings. Implications are discussed.

Key Words: Sleep Quality, HIV, Sleep disturbances, Prevalence

Introduction

The uncertainties of human immunodeficiency virus (HIV) infection and its progression to acquired deficiency syndrome (AIDS) are the source of tremendous psychological and social burdens (Kalichman, 1998). Aside from the ramifications of dealing with a grave illness, HIV-positive individuals must also contend with psychosocial problems, such as social stigma, decreased quality of life, mental health problems, and sleep difficulties (Kalichman, 1998; Nokes, Chidekel, & Kendrew, 1999; Norman, et al., 1990; Phillips, 1999). Although recognition of sleep disturbances occurred early in the outset of the HIV epidemic (Coates, Temoshok, & Mandel, 1984), many aspects of the quality of life for HIV positive individuals need to be addressed. Some of these problems are not only symptomatic of psychological distress that would arise from being diagnosed with HIV (e.g. sleep difficulties), but they are also likely to further exacerbate psychosocial problems and diminish the ability to cope with psychosocial stress.

The death rate related to HIV has been declining in the US (Center for Disease Control and Prevention, 2002), while the incidence of HIV infection has stayed level. This indicates that HIV individuals are currently living longer than previously possible (Vosvick, et al., 2002) thanks to new complex treatment regimens and antiretroviral therapies. Gains in life expectancy have led to the need to address several psychosocial ramifications associated with long-term chronic illness as well as being associated with increased neurological symptoms (Arendt, 2005). One source of psychosocial distress common to HIV-positive individuals is chronic fatigue (Darko, McCutchan, Kripe, Gillin, & Golshan, 1992). HIV infection is often accompanied by other troubling physical symptoms such as weight loss, decreased appetite, and loss of feeling in extremities (Phillips, 1999). Unfortunately, many physiological symptoms of HIV infection and the side effects of many antiretroviral therapies used to treat HIV disease may exacerbate physical symptoms experiences by those infected (Cohen, Ferrans, Vizgirda, Kunkle, & Cloninger, 1996).

These physical problems, coupled with the psychological impact of a terminal illness, lead to a host of psychosocial difficulties. As research into psychosocial difficulties in the HIV population develops, the impact on sleep habits and patterns of HIV-positive individuals remains a focal point of research (Darko, et al., 1992; Nokes, Chidekel, & Kendrew, 1999) as poor sleep habits and quality can contribute to other conditions such depression/anxiety, poor concentration, cognitive difficulties, and a other psychological and physiological aspects of human functioning (Pilcher, Ginter, & Sadowsky, 1997). Sleep disturbances have been noted to appear soon after initial HIV infection and continue throughout the course of the disease (Cruess, et al., 2003). Recent evidence suggests that sleep disorders remain an issue even with HAART (Poupard et al., 2007) and may be related to certain antiretroviral compounds (Gray & Young, 2007; Nunez et al., 2001). The field of sleep research has identified two separate components which can be impacted by sleep disturbances: sleep habits/quality and quantity.

Quantity refers to the total number of hours slept, while sleep habits refer to behavioral patterns associated with sleep, such as schedules and the timing of activities that may interfere with sleep. Sleep quality generally refers to components related to a good night's sleep such as waking during the night, insomnia and waking up before wanting to (Buyaaw, Reynolds, Monk, Berman, & Kupfer, 1989). Studies that focused on sleep quality and sleep habits rather than sleep quantity have illuminated the importance of considering quality in sleep health assessment. Poor sleep quality can have a negative effect on mood, cognition, and a variety of physiological and psychological aspects of functioning (Pilcher, et al., 1997) including increased tension and decreased psychological well-being. Sleep difficulties have also been related to irritability, inability to cope, reduced quality of life, and reduced life expectancy in adult and college student populations (Pilcher, et al., 1997; Urponen, Partinen, Vuori, & Hasan, 1991). There is further evidence that sleep disturbances can impair learning, memory, and academic performance (Lack, 1986). Negative mood states have been clearly related to poor sleep quality (Bonnet, 1985; Gray & Watson, 2002; Lack & Morin, 1992). Perlis (2003) proposed that lack of sleep is the single best predictor of depression with 2 or more weeks of sleeplessness increasing the risk for depression 400 percent.

Sleep loss due to poor sleep quality has been linked to poor cognitive functioning as well (Roediger & McDermott, 1995). Within a clinical population such as HIV-positive patients, it becomes important to realize the interplay between specific symptoms, such as poor sleep quality, and overall functioning of the individual. Recent advances in the diagnosis and management of HIV disease have resulted in the delayed onset of AIDS and a declining AIDS death rate (Center for Disease Control and Prevention, 2002). HIV-positive individuals face longer life expectancies, but must cope with a host of psychosocial demands related to chronic illness. With the expanded life expectancy of persons living with HIV infection, management of problems such as sleep disturbances becomes increasingly important in improving quality of life. Understanding the role of sleep disturbances within the psychosocial context may further our ability to intervene at a holistic level and mitigate the effects of poor sleep quality on other aspects of life. To this end, this study examines the sleep habits/quality of persons living with HIV/AIDS in order to first provide baseline data about their sleep habits/quality and to provide a basic framework for further research and treatment development.

Method

Participants

The sample consisted of 125 HIV-positive individuals (85 men, 37 women, and 3 transgender individuals) who were receiving support services through an HIV/AIDS community programs in the southern United States. Ages ranged from 20 to 66 years ($M = 40$, $SD = 6.8$). The majority (58%) of participants identified themselves as African American; 32% as Caucasian; 5% as Native American; 4% as Latino/Hispanic; and 1% as other. The average length of HIV diagnosis was 3 years (range = .5 – 20 years), and 55 individuals reported an AIDS diagnosis.

Measures

The Sleep Quality Index (Urponen, et al., 1991) is an 8-item inventory of self-reported sleep difficulties. It is composed of one scale labeled *sleep quality*. Each item has three possible responses: no, <3 days per week, and 3-7 days per week. Responses are weighed as a 0, 1, or 2, with 2 representing the most severe symptom. The items are summed for a total score of sleep quality. Scores of 0 or 1 indicate good sleep quality, scores from 2 to 8 represent occasional sleep difficulty, and scores from 9 to 16 indicate poor sleep quality. Reliability of the scale for this sample, using Cronbach's alpha, was .74. This is consistent with prior research (c.f. Jenkins, 2004; Buboltz, Brown, & Soper, 2001). The validity of the SQI has been demonstrated in previous research as well (Urponen, et al., 1991). *The Sleep Habits Questionnaire* (Buboltz, et al., 2001) is composed of open-ended questions allowing comment on usual amounts of sleep, bedtimes, wake-up times, sleep habits during the week and weekend, time taken to fall asleep as well as the participant's views of the ideal amount of sleep desired nightly.

Procedure

Participants were recruited through posters placed in community HIV/AIDS outreach programs. The community service facilities agreed to allow solicitation of study participants, and a university Institutional Review Board approved the study. Participants received an overview of the study, provided informed consent, and received a survey packet that included a copy of the *Sleep Quality Index*, a *Sleep Habits Questionnaire*, and demographic questions. Anonymity was maintained at all times.

Results

Results from the *Sleep Quality Index* revealed that only 14% of the sample reported good sleep quality.

More than 45% of respondents had occasional sleep difficulties and 40% met the criteria for poor sleep quality. Comparisons to previous studies of sleep habits show that persons with HIV have poorer sleep quality than working adults (poor sleep quality = 9%) (Urponen, et al., 1991), and college students (poor sleep quality = 15%) (Buboltz, et al., 2001). It should be noted that there were no significant differences between men and women for any of the variables. Examination of specific sleep difficulties from the SQI included nocturnal awakening 3 to 7 days per week in 29% of the sample, and 24% experienced insomnia in the last 3 months. Nocturnal awakening and insomnia levels in this sample are significantly higher than levels reported in adult and college student populations (Pilcher, et al., 1997; Buboltz, et al., 2001). More than 33% reported having a disturbed night's sleep three or more days per week and more than 29% wake too early in the morning more than three times a week.

Results from the *Sleep Habits Questionnaire* revealed an average reported bed time of approximately 11pm during the week and approximately 12pm on the weekend. Average time slept on weekdays was approximately 7.4 hours and approximately 8.5 hours on weekends which is comparable to reported values for adults and college students. The average amount of time for individuals to fall asleep was 34.5 minutes compared to an average of 22 minutes for college students. Examination of the differences between the poor quality and good quality sleepers shows that the poor quality groups takes over 48 minutes to fall asleep while the good quality group is just over 16 minutes. In terms of length of sleep the poor quality group sleeps approximately 7 hours a night, while the good quality group sleeps approximately 8.5 hours a night. In terms of the use of sleep aides roughly 37% of the poor quality group reported using sleep aids while none of the good quality sleepers reported using sleep aides. Interestingly, there were no differences in reported daytime napping between the good and poor sleep quality groups.

Discussion

This study examined sleep habits and sleep quality of adults with HI. Results support and expand previous research that has shown that many HIV-positive persons suffer from some form of sleep disturbance. Results also indicate that members of this population have poorer sleep quality than the general population and college students. Taken together the findings suggest that persons living with HIV experience greater sleep difficulties, poorer sleep quality, and that these sleep disturbances could contribute to levels of depression, reduced coping abilities, and overall quality of life. However, length of sleep per night does not appear to deviate from recommended levels, but it appears that this sleep is very disturbed for persons living with HIV. Additionally, recent research indicates that sleep length may not be an important feature of sleep but that the quality of sleep may be the more important aspect (Pilcher, et al., 1997). As has been shown HIV individuals suffer from a number of sleep disturbances and the impact of these sleep disturbances on their functioning and their overall quality of life remains unclear at this time.

However, based on other research that has examined the relationship between sleep and functioning (Pilcher, et al., 1997; Pilcher & Ott, 1998; Smith & Lapp, 1991; Paulsen & Shaver, 1991) one can deduce that poor sleep more than likely has an impact on the lives of HIV individuals. Due to this impact it behooves mental health and medical professionals to address the sleep difficulties that an HIV/AIDS person is experiencing in an attempt to help improve their overall functioning and quality of life. The results of this study point to areas that mental health and medical professionals can focus on to help HIV-positive individuals with sleep difficulties. One area that seems particular important to address is their overall sleep quality and insomnia. Due to the likelihood of neurological complications with HIV (Arendt, 2005, Harezlak et al., 2011) as well as potential alterations in neurotransmitter systems (Silvers et al., 2006), it remains vital to consider nonpharmacological treatment options. General psychological interventions have produced reliable sleep pattern improvements in about 60 to 80% of the general population (Morin & Wooten, 1996; Murtagh & Greenwood, 1995).

Contrarily, pharmacological treatments have demonstrated little effectiveness in treating long term sleep problems (Morin & Wooten, 1996). The effectiveness of psychological interventions in the general population suggests that this treatment may also be effective with HIV-positive persons. Training individuals on good sleep practices and using a variety of other sleep interventions could help reduce the sleep problems reported by individuals living with HIV. Some examples of interventions that may be appropriate to reduce sleep problems in HIV-positive individuals include sleep hygiene, exercise, behavior therapy, and relaxation. Sleep hygiene is providing educational information about good sleep habits, foods to avoid, and lifestyle elements that can contribute to, or interfere with, a good night sleep. Exercise has been demonstrated to decrease the reporting of sleep difficulties and decrease the amount of time that it takes an individual to fall asleep (Matsumo, Saito, Abe, & Furumi, 1984; Youngstedt, Kriple, & Elliott, 1999) as well as increasing the time spent in stage 3 and 4 sleep.

Behavior therapy has also been suggested as a treatment for sleep difficulties (Buboltz, Soper, Brown, & Jenkins, 2002). Behavior therapy for sleep difficulties entails instructional procedures that involve the context of sleep and sleeping quarters. Relaxation therapies focus on decreasing arousal level to ease sleep onset. Specifics include behavioral relaxation therapy such as progressive muscle relaxation and deep breathing exercises, as well as cognitive imagery. Behavioral approaches tend to work well with simple physical restlessness, while imagery is effective for people who have both mental and physical restlessness, such as ruminating about the day's events (Morin & Wooten, 1996). The results of this study indicate that HIV-positive individuals experience sleep difficulties in the form of both disturbed sleep quality and quantity. As studies address the sleep of HIV-positive individuals, the impact of sleep disturbances in HIV-positive individuals is beginning to emerge. However, little research has examined the role that sleep difficulties and quality may play in the progression of HIV. It is possible that sleep difficulties and quality may influence or moderate the development of HIV symptoms and complications. Given that sleep has garnered a great deal of attention in the popular media and the fact that HIV-positive individuals experience a great deal of sleep difficulties this is clearly an important avenue for research and intervention.

References

- Arendt, G. (2005). Neurological manifestations of HIV-Infection [sic] in the era of highly active antiretroviral therapy (HAART). *Fortschritte der Neurologie-Psychiatrie*, *73*, 577-586.
- Bonnet, M. H. (1985). Effect of sleep disruption on sleep, performance, and mood. *Sleep: Journal of Sleep Research and Sleep Medicine*, *8*, 11-19.
- Buboltz, W., Brown, F., & Soper, B. (2001). Sleep habits and patterns of college students: A preliminary study. *Journal of American College Health*, *50*(3), 131-135.
- Buboltz, W., Soper, B., Brown, F., & Jenkins, S. (2002). Treatment approaches for sleep difficulties in college students. *Counseling Psychology Quarterly*, *15*(3), 229-237.
- Coates, T., Temoshok, L., & Mandel, J. (1984). Psychosocial research is essential to understanding and treating AIDS. *American Psychologist*, *39*, 1309-1314.
- Cohen, F., Ferrans, C., Vizgirda, V., Kunkle, V., & Cloniger, L. (1996). Sleep in men and women infected with human immunodeficiency virus. *Holistic Nurse Practitioner*, *10*, 33-43.
- Cruess, D., Antoni, M., Gonzalez, J., Fletcher, M., Klimas, N., Duran, R., & Ironson, G. (2003). Sleep disturbance mediates the association between psychological distress and immune status among HIV-positive men and women on combination antiretroviral therapy. *Journal of Psychosomatic Research*, *54*, 185-189.
- Darko, D., McCutchan, A., Kripe, D., Gillin, C., & Golshan, S. (1992). Fatigue, sleep disturbance, disability, and indices of progression of HIV infection. *American Journal of Psychiatry*, *149*(2), 514-520.
- Gray, E., & Watson, D. (2002). General and specific traits of personality and their relation to sleep and academic performance. *Journal of Personality*, *70*, 177-206.
- Gray J, & Young B (2009). Acute onset insomnia associated with the initiation of raltegravir: A report of two cases and literature review. *AIDS Patient Care STDS*, *9*, 689-690.
- Harezlak, J., Buchthal, S., Taylor, M., Schifitto, G., Zhong, J., Daar, E., Alger, J., Singer, E., Campbell, T., Yiannoutsos, C., Cohen, R., & Navia, B. (2011). Persistence of HIV-associated cognitive impairment, inflammation, and neuronal injury in era of highly active antiretroviral treatment. *AIDS*, *25*(5), 625-33.
- Kalichman, S. C. (1998). *Understanding AIDS: Advances in research and treatment*. Washington, DC: American Psychological Association.
- Lack, L. C. (1986). Delayed sleep and sleep loss in university students. *College Health*, *35*, 105-110.
- Lack, P., & Morin, C. (1992). Recent advances in the assessment and treatment of insomnia. *Journal of Consulting and Clinical Psychology*, *60*, 586-594.
- Matsumoto, K., Saito, Y., Abe, M., & Furumi, K. (1984). The effects of daytime exercise on night sleep. *Journal of Human Ergology*, *13*, 31-36.
- McCann, S. J., & Stewin, L. L. (1987). Worry, anxiety, and preferred length of sleep. *Journal of Genetic Psychology*, *149*, 413-418.
- Morin, C., & Wooten, V. (1996). Psychological and pharmacological approaches to treating insomnia: Critical issues in assessing their separate and combined effects. *Clinical Psychology Review*, *16*, 521-542.
- Murtagh, D. R., & Greenwood, K. M. (1995). Identifying effective psychological treatments for insomnia: A meta-analysis. *Journal of Consulting and Clinical Psychology*, *63*, 79-89.
- Nokes, K., Chidekel, J., & Kendrew, J. (1999). Exploring the complexity of sleep disturbances in persons with HIV/AIDS. *Journal of the Association of Nurses in AIDS Care*, *10*(3), 22-29.

- Norman, S. E., Alejandro, D. C., Freeman, C., Kiel, M., Mendez, A., Duncan, R., Simoneau, J., & Nolan, B. (1992). Sleep disturbances in men with asymptomatic human immunodeficiency (HIV) infection. *Sleep, 15*(2), 150-155.
- Nunez, M., de Requena, D. G., Gallego, L., Jimenez-Nacher, I., Gonzalez-Lahoz, J., & Soriano, V. (2001). Higher efavirenz plasma levels correlate with development of insomnia. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology, 28*, 399–400.
- Paulsen, V.M., & Shaver, J.L. (1991). Stress, support, psychological states and sleep. *Social Sciences Medicine, 32*, 1237-1243.
- Perlis, M., & Lichstein, K. (2003). *Treating sleep disorders: Principles and practices of behavioral sleep medicine*. Washington, DC: Wiley.
- Phillips, K.D. (1999). Physiological and pharmacological factors of insomnia in HIV disease. *Journal of the Association of Nurses in AIDS Care, 10*(5), 93-97.
- Pilcher, J., Ginter, D., & Sadowsky, B. (1997). Sleep quality versus sleep quantity: Relationships between sleep and measures of health, well being, and sleepiness in college students. *Journal of Psychosomatic Research, 42*, 583-596.
- Pilcher, J., & Ott, E. S. (1998). The relationship between sleep and measures of health and well-being in college students: A repeated measures approach. *Behavioral Medicine, 23*, 170-178.
- Poupard, M., Ngom Gueye, N. F., Thiam, D., Ndiaye, B., Girard, P. M., Delaporte, E., Sow, P. S., & Landman, R. (2007). Quality of life and depression among HIV-infected patients receiving efavirenz-or protease inhibitor-based therapy in Senegal. *HIV Med, 8*(2), 92-95.
- Roediger, H., & McDermott, K. B. (1995). Creating false memories: Remembering works not presented in lists. *Journal of Experimental Psychology: Learning, Memory, & Cognition, 21*, 803-814.
- Smith, C., & Lapp, L. (1991). Increases in number of REMS and REM density in humans following and intensive learning period. *Sleep, 14*, 325-330.
- Urponen, H., Partinen, M., Vuori, I., & Hasan, J. (1991). Sleep quality and health: Description of the sleep quality index. In J. H. Peter (Ed.), *Sleep and health risk* (pp. 555-558). Berlin: Springer.
- Vosvick, M., Gore-Felton, C., Koopman, C., Thoresen, J. K., & Spiegel, D. (2002). Maladaptive coping strategies in relation to quality of life among HIV+ adults. *AIDS and Behavior, 6*(1), 97-106.
- Youngstedt, S., Kripe, D., & Elliott, J. (1999). Is sleep disturbed by vigorous late-night exercise? *Medicine and Science in Sports and Exercise, 31*, 864-869.