

## Knowledge of Effect of Exercise on HIV-Infected Persons among Health Care Professionals in North Eastern Nigeria

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### Abstract

**Objectives:** To investigate the knowledge of effect of exercise on HIV- infected persons among health care professionals. **Methods:** The study was conducted at the University of Maiduguri Teaching Hospital (UMTH), a tertiary referral center located in Maiduguri, northeastern Nigeria. Instrument for the study was self administered questionnaire validated by experts in cardiopulmonary physiotherapy and exercise physiology with reliability coefficient of 0.82, and distributed among 289 participants with response rate of 90%. **Results:** The age range and mean age of the participants were 20-59 years and  $37.27 \pm 7.75$  respectively. Substantial number of the participants (46.2%) demonstrated good knowledge of effect of exercise on HIV-infected persons. The mean scores for nurses and dentists were quite low compared to each of the other health care professionals. **Conclusion:** More than a quarter of the participants lacked good knowledge on the effect of exercise on HIV-infected persons. This needs to be remedied through organized enlightenment programs.

**KEY WORDS:** Health Care Professionals; HIV-Infected Persons; Cardiopulmonary Physiotherapy; Highly Active Antiretroviral Therapy; Complementary Therapy; Tertiary Referral health institution

### Introduction

HIV infection was hitherto a fatal condition but with the advent of highly active antiretroviral therapy (HAART) in 1996, it has since changed to a manageable chronic illness. *Cade et al. (2004)* observed that as a result of this breakthrough, a greater number of infected individuals live longer by overcoming the health related consequences and challenges associated with HIV. However, the resultant effect of this life-prolonging antiretroviral therapy is the increase in the pool of HIV infected persons (*Whiteside, 2002*). This increase in population has in turn escalated the

societal burden of the disease, and led to high demand on health care services and resources (*Fido and Al Kazeemi, 2002*). Beside the health benefits of HAART, it has been observed that since the commencement of this therapy, some known and previously unrecognized adverse reactions that were not detected at the early clinical trials are now present. For instance, *Boufassa et al. (2001)* observed that apart from numerous health problems associated with the HIV infection itself, affected individuals also experience adverse effects arising from HAART that could affect the physical, physiological and psychosocial components of their health. Thus, persons

living with HIV face a lot of health challenges that arise from the infection itself, knowledge of the fact that one is infected, the therapy used in the treatment of the disease or a combination of all these factors. While many of these health challenges are treatable with pharmacological agents, *Ciccolo et al. (2004)* posited that it is not practicable or wise to rely on additional medications to achieve this effect. The authors therefore advocated for the use of non-pharmacological methods as adjunct to HIV treatment to reduce the adverse effects of drugs, pill burden and possible drug interactions (*Ciccolo et al., 2004*). In the United States (US), *Standish et al. (2001)* documented that exercise is consistently listed as the most common, most effective, non toxic and the least expensive non-pharmacological method and complementary therapy utilized by HIV-infected persons. This was subsequently supported by numerous anecdotal and empirical studies (*Dudgeon et al., 2004; O'Brien et al., 2006; Terry et al., 2006; Hand et al., 2009; Tiozzo et al., 2013*). It is therefore reasonable to expect HIV-infected persons all over the world to utilize exercise as a strategy to cope with the health problems imposed by HIV and its treatment.

Despite these documented and established evidence on the beneficial effects of exercise on HIV, there is dearth of published studies on knowledge of effect of exercise on HIV-infected persons among health care professionals, notwithstanding the recognition and knowledge of the effectiveness of exercise on persons living with HIV/AIDS in the developed world. In most parts of the developing world,

including Nigeria, in spite of the burden and complications of HIV infection and its treatment, there is paucity of data on the effect of exercise on HIV-infected individuals, let alone on the knowledge of effect of exercise on this population. We therefore posit that the lack of knowledge on the effect of exercise on HIV-infected persons among Nigerian health care professionals might be the reason for the dearth of literature on the effect of exercise on the overwhelming population living with HIV/AIDS in the country, notwithstanding the country's ranking as the third and second among the countries with the highest inhabitants of HIV-infected persons in the world and Africa respectively. This apparent gap prompted this study in an attempt to fill the existing vacuum. The purpose of the study is therefore to determine whether health care professionals working at a teaching hospital in northeastern Nigeria have the basic knowledge on the effect of exercise on HIV-infected persons.

## Methods

The study was carried out at the University of Maiduguri Teaching Hospital (UMTH), a tertiary referral health institution located in Maiduguri, the capital of Borno State in the northeastern region of Nigeria. The hospital serves the entire region and neighboring countries of Cameroun, Chad and Niger. It has an established antiretroviral (ARV) clinic supported by President's Emergency Plan for Aids Relief (PEPFAR) which offers comprehensive care to over 600 persons living with HIV/AIDS per month.

Health care professionals aged 20 years and above with more than one year working experience were included in the

study. The instrument for the study was a self administered questionnaire which underwent face and content validation by experts in cardiopulmonary physiotherapy and exercise physiology. To ensure reliability, test re-test of the instrument was carried out two weeks apart on 20 randomly selected health care professionals from the participating clinical departments. The interval of two weeks was in order to reduce memorization and potential problems with the wording of the items, which according to *Smith et al. (2006)*, are the impetus for test-retest. The obtained correlation coefficient,  $r$  was 0.82. The selected 20 health care professionals used in testing the instrument were excluded from the study.

An informed consent form was attached to each copy of the questionnaire and ethical approval for the study was obtained from the Research and Ethical Committee of the hospital. The questionnaire comprised two sections. The first section (section A) dealt with the socio-demographic characteristics of the respondents, while the other section (i.e. section B) contained close-ended 20 item questions, each with three domains (Agree, Disagree or Undecided responses). Some of the item questions on the questionnaire are on what the respondents thought were the impact of exercise on CD4 cell count, immune status, and patients' well being and resistance to diseases. Two hundred and eighty nine copies of the questionnaire were distributed to the participants, out of which 260 were duly filled, returned and used for data analysis, giving a response rate of 90%.

**Scoring:** A correct answer to each question scored 1, hence the maximum score was 20 and minimum 0. An "Agree" and "Disagree" responses to a correct and wrong statement respectively scored 1 each, while an "Undecided" response was disregarded. Based on these, the higher the score, the higher the knowledge of the health care professional/s on the effect of exercise on HIV-infected persons. For the purpose of simplicity, the scores were ranked as follows: 0-5, 6-10, 11-15 and 16-20 indicating poor knowledge, fair knowledge, good knowledge and very good knowledge of effect of exercise on HIV infected persons respectively.

**Statistical Analysis:** Descriptive statistics were used to summarize the sociodemographic characteristics of the participants. Independent t-test and one way analysis of variance (ANOVA) as inferential statistics were used to analyze the knowledge of effect of exercise on HIV-infected persons by sociodemographic characteristics. Least of square difference (LSD) post hoc test was employed to determine where any significant difference exists. An alpha value of  $p < 0.05$  was considered significant. Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 17.0 software (SPSS Inc., Chicago, Illinois, USA).

## Results

A total of 260 health care professionals at the teaching hospital participated in this study. The age of the participants ranged from 20 to 59 years with mean age of  $37.27 \pm 7.75$  and majority were in the ranges of third (38.8%) and fourth decades (36.2%).

Male participants accounted for 58.5% and most (84.2%) were married. Nursing recorded the highest number of participants (57.3%) among the health care professional groups. Based on educational qualification, 68.1% possessed degrees while those with postgraduate qualification accounted for 24.2%. Participants in the low designation were the majority (48.1%) and participants with 2-9 years of working experience constituted 41.9%.

Table 1: Socio-demographic characteristics of the participants

VARIABLE	CATEGORY	N (%)
Age group	20-29	47 (18.1)
	30-39	101 (38.8)
	40-49	94 (36.2)
	≥50	18 (6.9)
Gender	Male	152 (58.5)
	Female	108 (41.5)
Marital Status	Single	40 (15.4)
	Married	219 (84.2)
Profession	Separated	1 (0.4)
	Physiotherapy	10 (3.8)
	Medicine	64 (24.6)
	Medical Lab.	22 (8.5)
	Science	
	Dentistry	3 (1.2)
	Nursing	149 (57.3)
Educational Qualification	Pharmacy	12 (4.6)
	Degree	177 (68.1)
Postgraduate Qualification	Diploma/Certificate	83 (39.1)
	Yes	63 (24.2)
Designation/Rank	No	197 (75.8)
	High	71 (27.3)
	Middle	64 (24.6)
	Low	125 (48.1)
Years of Working Experience	1-10	109 (41.9)
	11-20	97 (37.3)
	21-30	44 (16.9)
	≥31	10 (3.9)

Table 2: Ranking of scores on knowledge of effect of exercise

CATEGORIES OF SCORE	N (%)
0-5 (poor knowledge)	10 (3.8%)
6-10 (fair knowledge)	58 (22.3%)
11-15 (good knowledge)	120 (46.2%)
16-20 (very good knowledge)	72 (27.7%)

The socio-demographic characteristics of the respondents are summarized in Table 1. Substantial

number of the participants (46.2%) demonstrated good knowledge of effect of exercise on HIV-infected persons as shown in Table 2.

Table 3: Mean scores and significant levels on knowledge of effect of exercise on HIV infected persons

VARIABLE	N	MEAN SCORE	TEST STAT	P-VALUE
<b>Gender</b>				
Male	152	13.68±3.7	0.297†	0.000*
Female	108	11.83±3.9		
<b>Marital Status</b>				
Single	40	12.90±3.2	0.509††	0.750
Married	219	12.93±4.0		
Separated/Divorced	1	10.00±0.0		
<b>Profession</b>				
Physiotherapy	10	14.80±3.4	0.884††	0.000*
Medicine	64	13.86±4.4		
Medical Lab.	22	13.82±4.2		
Science				
Dentistry	3	8.67±1.2		
Nursing	149	12.14±3.5		
Pharmacy	12	15.33±2.3		
<b>Educational Qualifications</b>				
Degree	178	13.09±4.3	0.303†	0.282
Diploma/Cert	82	13.54±3.8		
<b>PG degree</b>				
Yes	63	14.27±4.1	0.512 †	0.002*
No	197	12.48±3.7		
<b>Working exp (yrs)</b>				
2-9	109	9.60±2.9	0.729††	0.149
10-17	97	10.34±3.3		
18-25	44	11.21±3.7		
26 & above	10	11.89±4.5		
<b>Rank</b>				
High	71	14.02±4.0	0.589††	0.001*
Middle	64	14.11±3.3		
Low	125	11.82±4.1		

\*= the mean difference is significant at 0.05 level

Table 3 depicts the mean scores and significant level on knowledge of effect of exercise on HIV infected persons among the participants.

Table 4: LSD Post hoc test for knowledge of effect of exercise on HIV infected persons among different professions

Comparison between Professions	Mean Difference	Significance	
Medicine	0.941	0.457	
Med. Lab Sc	0.982	0.489	
Physiotherapy	6.133	0.013*	
Dentistry	2.659	0.029*	
Nursing	0.533	0.738	
Pharmacy			
Medicine	Physiotherapy	-0.941	0.457

	Med. Lab Sc	-0.041	0.964
	Dentistry	5.193	0.019*
	Nursing	1.718	0.002*
	Pharmacy	-1.474	0.209
Med Lab Sc	Physiotherapy	-0.982	0.489
	Medicine	-0.041	0.964
	Dentistry	5.152	0.025*
	Nursing	1.677	0.049*
Dentistry	Pharmacy	-1.515	0.257
	Physiotherapy	-6.133	0.013*
	Medicine	-5.193	0.019*
	Med Lab Sc	-5.152	0.025*
Nursing	Nursing	-3.474	0.110
	Pharmacy	-6.667	0.006*
	Physiotherapy	-2.659	0.029
	Medicine	-1.718	0.002*
Pharmacy	Med Lab Sc	-1.677	0.049*
	Dentistry	3.474	0.110
	Pharmacy	-3.192	0.005*
	Physiotherapy	0.533	0.738
Pharmacy	Medicine	1.474	0.209
	Med Lab Sc	1.515	0.257
	Dentistry	6.667	0.006*
	Nursing	3.192	0.005*

\* = the mean difference is significant at 0.05 level

**Table 5: LSD Post hoc test on knowledge of effect of exercise on HIV infected adult in different designation/rank**

Designation/Rank	Mean Difference	Significance	
High rank	Middle Rank	0.084	0.923
	Lower Rank	2.199	0.002*
Middle rank	High rank	0.084	0.923
	Lower Rank	2,283	0.003*
Lower Rank	High rank	-2.199	0.002*
	Middle Rank	-2.283	0.003*

\* = the mean difference is significant at 0.05 level

Tables 4 and 5 represent the post hoc tests to determine where significant differences exist among professional groups and ranks.

### Discussion

This study to the best of our knowledge and based on literature reviews seems to represent the first attempt to publish a work on the knowledge of effect of exercise on persons living with HIV among health

care professionals, notwithstanding substantial studies by various scholars on the effect of exercise on HIV/AIDS. Data from the study showed that majority (57.3%) of the participants were nurses. This is not surprising, because in most (if not all) public hospitals in Nigeria, nurses constitute the highest workforce among other health care professionals. Nurses are also the most populated health care professionals in Nigeria, probably due to the nature and relative short periods of their training in many public health institutions in the country. The findings from the study revealed male preponderance compared to their female counterparts. This may be attributed to the fact that most health care professions (except nursing) in our environment are dominated by men. This male predominance in our study could also be as a result of socio-cultural and religious factors which may restrict women to public or work life as shown in previous studies [(Akinpelu *et al.*, 2011; Maduagwu *et al.*, 2012) in Borno State, Nigeria, where this present study was conducted.

Majority (75%) of the participants in this study were aged between 30 and 49 years. This could be deduced from the fact that this age group is the peak age of productivity and strength of any work force in most organizations. Only 27.7% of the health care professionals had very good knowledge on the subject despite an established ARV clinic at UMTN. This could be as a result of the belief that exercise may suppress the immune functions and thus increase HIV replication (Stanley *et al.*, 1996). However, current evidence shows that moderate intensity exercise can reduce

HIV replication (Veljkovic et al, 2010) and does no harm to the immune system, but rather has boosting and favorable effects on immune, cardiorespiratory and psychological functions, as well as body composition and metabolic status of HIV infected persons (O'Brien et al., 2008; Hand et al., 2009; Tiozzo et al., 2013). Significant difference ( $p=0.00$ ) existed between the mean scores of the male and female health care professionals in favour of the former. The reason for this may be difficult to infer, it could be that men seek information more than women, especially in our environment, where women are saddled with domestic chores, which include child bearing and up-bringing, and home making among other things. This is similar to the findings of Tsuda et al. (1982) in a study on knowledge of physiotherapy at a high school in the United States of America, where males were found to have significant higher knowledge than their female counterparts. It could also be as a result of the male preponderance in our study. Mean score of the participants who had postgraduate degrees was significantly higher ( $p=0.02$ ) compared to non holders. This is expected, as the former, by the virtue of their additional educational background are expected to be more grounded in knowledge and information that relate to health. The mean scores for nurses and dentists were quite low compared to each of the other health care professionals. Post hoc test showed no significant difference ( $p=0.11$ ) between the two professional groups based on their mean scores. The mean scores of the other four professions showed various degrees of significant differences when compared with either dentistry or nursing as follows:

physiotherapy vs dentistry vs nursing ( $p=0.013$ ;  $p=0.029$ ), pharmacy vs dentistry vs nursing ( $p=0.006$ ;  $p=0.005$ ), laboratory science vs dentistry vs nursing ( $p=0.025$ ;  $p=0.049$ ) and medicine vs dentistry vs nursing ( $p=0.019$ ;  $p=0.002$ ). The reason for these low mean scores by these two professional groups (especially the dentists) may be difficult to ascertain. It may be partially explained based on the ground that most nursing training institutions in Nigeria are located at public hospitals rather than universities. Based on this, many nurses may not know or understand the roles of physiotherapists who are trained in the universities, and have fundamental and indebt knowledge on exercise related issues. The same reason may be applied to dentists, most government universities in Nigeria, have dental schools, while only few universities train physiotherapists. This may imply that only few dentists know and understand the roles of physiotherapists as experts in exercise related matters. These views are based on the fact that most Nigerian trained health care professionals erroneously perceive physiotherapy profession as synonymous to exercise. Therefore, to such health care professionals, knowing the roles of physiotherapists is as good as having knowledge of exercise. This assertion corroborates the observation made by Adekunle et al. (2004) that other health care professionals in Nigeria are not fully aware of the role of physiotherapy in the management of HIV/AIDS. These reasons may account for sparse referrals between dentists and physiotherapists at the teaching hospital where the study was conducted. Another possible reason that might have accounted for the lowest score

by dentists may be as a result of the very low number (three) that participated in the study. Pharmacists' mean score was the highest, probably due to their knowledge base on antiretroviral drugs and the adverse effects of these drugs. This mean score, although did not depict any significant difference when compared with each of the other three health care professional groups (physiotherapy, medicine and medical laboratory science). This infers that these four professional groups have relative similar knowledge on the effect of exercise on persons living with HIV. Physiotherapists would have been expected to have the highest mean score as a result of the nature of their training and knowledge on physical activity and exercise. The reason for the physiotherapists' lower mean score compared to that of the pharmacists is not astounding. *Oyeyemi et al. (2008)* observed that Nigerian physiotherapists were neither comfortable nor willing to manage persons living with HIV/AIDS. In another study in 2011, *Oyeyemi et al. (2011)* concluded that Nigerian physiotherapists showed unsatisfactory knowledge of universal precautions and AIDS pathophysiology, and many of them felt uncomfortable and showed low ethical disposition when it comes to caring for persons living with HIV/AIDS. This observation may not be peculiar to Nigerian physiotherapists alone. In Canada, *O'Brien et al. (2006)* reported that few physiotherapists work with persons living with HIV. *Worthington et al. (2005)* also in Canada had earlier observed that most physiotherapists never managed persons living with HIV, were uncomfortable with the idea and reported not receiving HIV training in their

rehabilitation degree programs. Laboratory scientists and doctors frequently come in contact with persons living with HIV due to the nature of their jobs, hence their higher scores compared to nurses and dentists. Also frequent referrals and contacts between doctors and physiotherapists during the course of training and duty might have played a significant role on the doctors' higher mean score. Post hoc test on knowledge of effect of exercise on HIV infected persons among health care professionals in different designation/ranks showed no significant difference ( $p=0.923$ ) between those on high and middle ranks. Significant differences existed between high and low ranks, and middle and low ranks ( $p=0.002$  and  $p=0.003$  respectively). This may be as a result of years of working experience as well as higher education. The more the years of professional practice in health care, the higher the rank and hence the more knowledgeable one becomes in health related issues. Also, the higher the educational level, the higher the rank and thus, because of the educational background, the higher the knowledge.

*Conclusion:* In spite of the presence of functional and heavily populated ARV clinic at the hospital where this study was conducted, more than a quarter (26.1%) of the health care professionals lacked good knowledge on the beneficial effect of exercise on persons living with HIV. This is somehow astounding and hence unacceptable and needs to be remedied through organized enlightenment programs. Also, there is a need for greater education to increase the knowledge base and role of physiotherapy in the total care and treatment of persons living with

HIV/AIDS which could be well enhanced by including a comprehensive HIV/AIDS curriculum as part of physiotherapy degree training in Nigeria. It is envisaged that the study may inspire scholars from developing countries, especially Nigeria to carry out studies on the effect of exercise on individuals living with HIV as being done in most developed nations of the world. This study also showed the need for concerned health care policy makers in Nigeria to incorporate physiotherapists in ARV clinics as obtained in other countries. This will enhance team work as well as total HIV care and management in the country.

**Limitations:** The obvious limitation of this study is rooted in the fact that discussion was primarily based on the observed findings from the study. The reason for this may be attributed to the present paucity of both empirical and anecdotal data on knowledge of effect of exercise on HIV-infected individuals. Hence, our study may serve as a bedrock and precursor for future studies on the subject. Also the inequality in the proportions of the health care professional groups that participated in the study might have skewed the result and hence, the findings of the study. Therefore, the need for future studies to minimize this disparity during recruitment of participants.

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