



## ORIGINAL RESEARCH PAPER

### EFFECT OF OCCUPATIONAL THERAPY INTERVENTION ON FUNCTIONAL MOBILITY AND QUALITY OF LIFE IN PATIENTS WITH RISK OF OSTEOPOROSIS RECEIVING ANTIRETROVIRAL THERAPY IN HIV.

## Occupational Therapy

**KEY WORDS:** ART, Fall risk, OSTA, OPAQ, PLWHIV, WHOQOL-HIV

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#### ABSTRACT

**Background:** Anti-retroviral therapy (ART) is associated with low bone mineral density (BMD) among people living with HIV (PLWHIV). Thus, physical activity needed to be recommended for improving bone health in patients with reduced BMD. **Aim:** To find out efficacy of occupational therapy intervention on functional mobility and quality of life in patients with risk of osteoporosis receiving antiretroviral therapy in HIV. **Methodology:** A study was conducted among 42 PLWHIV. OSTA was used to screen the participants. POMA, OPAQ and WHOQOL-HIV was used pre and post occupational therapy intervention. Twice a week exercise therapy was given for eight weeks. **Results:** It showed statistically highly significant ( $p < 0.000$ ) difference in functional mobility on POMA, all domains of OPAQ and WHOQOL-HIV from baseline to 8 weeks post exercise therapy. **Conclusion:** Occupational therapy intervention is helpful in reducing the risk of fall and improve functional mobility in PLWHIV bringing a positive change in the quality of life.

#### INTRODUCTION

According to the world health organization, 75% are receiving antiretroviral treatment (ART). ART drugs lead to reduced bone mineral density. A decrease of about 2–6% in BMD in the first two years after initiation of ART of the regimen has been reported. The major related pathogenesis is that HIV infection alters bone metabolism due to long-term use of ART which restricts the body functional mobility, activity levels participation & quality of life. (Nasreen Motala, 2008).<sup>1,2,3,4</sup>

Very less literature available on the role of strengthening and aerobic exercises in prevention of risk for osteoporosis of those on ART in patients living with HIV. So the study was conducted with the aim to find out efficacy of occupational therapy intervention on functional mobility and quality of life in patients living with HIV.

Both male and female with the age group of 18-60 years, Patient on anti-retroviral therapy for more than 12 months with moderate to higher risk for osteoporosis were included, whereas cardiorespiratory, neurological, psychiatric illness, history of any surgery/ fracture < 6 months were excluded.

#### MATERIALS & METHODS

This was quasi experimental study design. 45 participants were screened for risk of osteoporosis on Osteoporosis Self-Assessment Tool (OSTA). Out of which 42 participants were included and assessed for functional mobility on Performance oriented mobility assessment (POMA), quality of life on OPAQ and WHOQOL-HIV pre and post occupational therapy intervention. Institutional Ethics Committee sanction was taken for the same.

#### Screening Tool:

1. OSTA: It is a clinical instrument designed for patients at risk of osteoporosis, who would benefit from a bone mineral density measurement.<sup>8</sup>

Outcome measure tool

1. POMA: It is one of the most widely used batteries designed

to assess balance, gait, and fall risk in older adults. A score less than 19 out of 28 has a sensitivity of 68% and a specificity of 88% for predicting an individual who will have two or more falls.<sup>9</sup>

2. WHOQOL-HIV BREF: It is used to assess the quality of life in patients living with HIV. It includes physical, psychological, environmental, social, transfer, S/R/B domains. It indicates higher the score better is quality of life.<sup>10</sup>

3. Osteoporosis Assessment Questionnaire: It is a reliable and valid self-assessment questionnaire developed in 1993. It contains 34 questions, 0 represents the worst possible health status and 100 represents the better quality of health of individual domains.<sup>11</sup>

Occupational therapy intervention was given for eight weeks' with twice a week, included stretching, aerobic, strengthening and balance exercises to the subjects.<sup>1,5,6,33</sup> Each session lasted up to 45 minutes, with adequate rest periods. Patients were assessed at the baseline, 4th and 8th week for functional mobility and quality of life.

#### Statistical Analysis

Statistical analysis was done using SPSS software version 26.0, IBM. For all the statistical tests,  $p < 0.05$  was consider to be statistically significant.

#### RESULT

**Table 1: Demographic Data**

| N= 42             | Minimum | Maximum | Mean  | SD  |
|-------------------|---------|---------|-------|-----|
| Male= 18(42.9%)   |         |         |       |     |
| Female= 24(57.1%) |         |         |       |     |
| Age               | 34      | 60      | 48.02 | 7.8 |
| Weight            | 46      | 71      | 55.67 | 5.6 |

**Table 2: Distribution As Per Osteoporosis Screening Risk**

|                   | Frequency | Percentage |
|-------------------|-----------|------------|
| Intermediate risk | 8         | 19.0       |
| Low risk          | 34        | 81.0       |
| Total             | 42        | 100.0      |

**Table 3: Intra Group Comparison Of Domains Of WHO-QOL**

| Domain        |                      | Mean  | Minimum | Maximum | Median | SD  | Mean rank | Chi - square value | P value of Freidman test |
|---------------|----------------------|-------|---------|---------|--------|-----|-----------|--------------------|--------------------------|
| Physical      | Baseline             | 48.29 | 42      | 51      | 49.00  | 2.6 | 1         | 84.000             | <0.000**                 |
|               | 4 <sup>th</sup> week | 58.48 | 50      | 65      | 58.00  | 2.5 | 2         |                    |                          |
|               | 8 <sup>th</sup> week | 65.45 | 58      | 70      | 67.00  | 4.0 | 3         |                    |                          |
| Psychological | Baseline             | 59.02 | 50      | 51      | 60.00  | 3.3 | 1         | 78.255             | <0.000**                 |
|               | 4 <sup>th</sup> week | 59.95 | 50      | 65      | 61.00  | 3.7 | 1         |                    |                          |
|               | 8 <sup>th</sup> week | 63.10 | 54      | 70      | 64.00  | 3.8 | 3         |                    |                          |

|              |          |       |    |    |       |     |   |        |          |
|--------------|----------|-------|----|----|-------|-----|---|--------|----------|
| Independence | Baseline | 50.43 | 47 | 53 | 50.00 | 1.6 | 1 | 84.000 | <0.000** |
|              | 4th week | 59.05 | 52 | 62 | 60.00 | 3.0 | 2 |        |          |
|              | 8th week | 67.64 | 56 | 70 | 68.00 | 3.3 | 3 |        |          |
| Social       | Baseline | 46.26 | 44 | 50 | 46.00 | 1.9 | 1 | 65.448 | <0.000** |
|              | 4th week | 46.74 | 44 | 50 | 46.00 | 2.2 | 1 |        |          |
|              | 8th week | 48.81 | 44 | 58 | 48.00 | 3.3 | 2 |        |          |
| Environment  | Baseline | 50.43 | 48 | 54 | 50.00 | 1.1 | 1 | 84.000 | <0.000** |
|              | 4th week | 55.14 | 52 | 59 | 55.00 | 1.9 | 2 |        |          |
|              | 8th week | 62.40 | 59 | 65 | 62.00 | 1.6 | 3 |        |          |
| S/R/B        | Baseline | 59.57 | 52 | 62 | 60.00 | 1.8 | 1 | 79.022 | <0.000** |
|              | 4th week | 60.00 | 52 | 63 | 60.00 | 1.7 | 1 |        |          |
|              | 8th week | 63.43 | 66 | 68 | 64.00 | 2.1 | 3 |        |          |

Table 4: Intragroup Comparison Of POMA Score

|      |                      | Mean  | Minimum | Maximum | Median | SD  | Mean rank | Chi - square value | P value of Freidman test |
|------|----------------------|-------|---------|---------|--------|-----|-----------|--------------------|--------------------------|
| POMA | Baseline             | 24.07 | 24      | 25      | 24.00  | 0.2 | 1.2       | 46.300             | < 0.000**                |
|      | 4 <sup>th</sup> week | 25.10 | 23      | 27      | 25.00  | 1.1 | 2.2       |                    |                          |
|      | 8 <sup>th</sup> week | 24.07 | 25      | 27      | 25.00  | 0.3 | 2.4       |                    |                          |

Table 5: Intragroup Comparison For Domains Of OPAQ

| Domain       |                      | Mean | Minimum | Maximum | Median | SD   | Mean rank | Chi - square value | P value of Freidman test |
|--------------|----------------------|------|---------|---------|--------|------|-----------|--------------------|--------------------------|
| Walking      | Baseline             | 3.1  | 2       | 4       | 3.00   | 0.5  | 1.01      | 83.509             | <0.000**                 |
|              | 4 <sup>th</sup> week | 4.6  | 3       | 6       | 4.00   | 0.8  | 1.9       |                    |                          |
|              | 8 <sup>th</sup> week | 6.2  | 4       | 8       | 6.00   | 0.9  | 3.0       |                    |                          |
| ADL          | Baseline             | 3.3  | 2       | 4       | 3.00   | 0.6  | 1.0       | 83.509             | <0.000**                 |
|              | 4 <sup>th</sup> week | 4.8  | 3       | 6       | 5.00   | 0.7  | 2.01      |                    |                          |
|              | 8 <sup>th</sup> week | 6.6  | 5       | 8       | 7.00   | 0.7  | 2.99      |                    |                          |
| Back pain    | Baseline             | 3.5  | 3       | 5       | 3.00   | 0.7  | 1.01      | 83.509             | <0.000**                 |
|              | 4th week             | 5.2  | 4       | 7       | 5.00   | 0.9  | 1.99      |                    |                          |
|              | 8th week             | 7.2  | 5       | 8       | 7.00   | 0.8  | 3.0       |                    |                          |
| Body image   | Baseline             | 3.5  | 3       | 4       | 4.00   | 0.5  | 1.0       | 84.000             | <0.000**                 |
|              | 4th week             | 5.2  | 4       | 7       | 5.00   | 0.69 | 2.0       |                    |                          |
|              | 8th week             | 7.3  | 6       | 8       | 7.00   | 0.64 | 3.0       |                    |                          |
| Independence | Baseline             | 3.2  | 3       | 4       | 3.00   | 0.4  | 1.0       | 83.036             | <0.000**                 |
|              | 4th week             | 5.2  | 4       | 7       | 5.00   | 0.8  | 2.02      |                    |                          |
|              | 8th week             | 6.7  | 5       | 8       | 7.00   | 0.9  | 2.98      |                    |                          |
| Transfer     | Baseline             | 3.6  | 3       | 5       | 4.00   | 0.6  | 1.0       | 83.509             | <0.000**                 |
|              | 4th week             | 5.2  | 4       | 7       | 5.00   | 0.7  | 2.01      |                    |                          |
|              | 8th week             | 7.0  | 6       | 8       | 7.00   | 0.8  | 2.99      |                    |                          |
| Fear of fall | Baseline             | 3.3  | 3       | 4       | 3.00   | 0.4  | 1.01      | 83.000             | <0.000**                 |
|              | 4th week             | 5.0  | 4       | 6       | 5.00   | 0.79 | 2.0       |                    |                          |
|              | 8th week             | 6.9  | 6       | 8       | 7.00   | 0.78 | 2.99      |                    |                          |

## DISCUSSION

Total N= 42 subjects, 57.1% female and 42.9 % male with mean age (48.02 ± 7.8) that met the inclusion criteria were included in the study. (Table.1) It is in accordance with the findings from a national sample of Indian Female which illustrates greater HIV infection prevalence based on exposure to abuse from husbands.<sup>12</sup> Eugenia Negrodo (2017), also stated the prevalence of HIV-infected people aged 45 to 50 years or older is increasing rapidly.<sup>13</sup>

As per Table 2, (81%) reported low risk of osteoporosis whereas (19%) reported intermediate risk of osteoporosis. HIV modulates the function of inflammatory cells, thus the majority of bone loss occurs during virus replication and during immune reconstitution at antiretroviral therapies (ART) initiation, which both increases osteoclast activity.<sup>14</sup> Grace A. McComsey (2010), concluded that BMD decreases further within the first 2 years after initiation of various ART regimens.<sup>15</sup>

Table 3 shows, statistically highly significant ( $p < 0.000$ ) difference from baseline to 8 weeks in all domains of WHOQOL-HIV.

This could be due to an ART OPD is conducted on daily basis for PLWHIV and they were referred to occupational therapist for exercises and psychologist for counselling. Thus, such type of comprehensive treatment measures would have

played an effective role in improving their HRQOL. Kevin Martin (2016), Hassan Joulae et.al (2018) in his cross-sectional study, on health-related quality of life in PLWHIV, concluded that appropriate medical support, health care satisfaction and access to the necessary care, increased QOL.<sup>16,17</sup>

As per Table.4, a statistically highly significant difference was seen for the values between the time intervals ( $p < 0.01$ ) with higher values at 4<sup>th</sup> week. The resistance exercises attenuate motor deficits by improving inter- and intramuscular coordination as well as neural control which causes improvement in balance impairment and gait disturbance.

Judge, Underwood and Gennosa (1993) & Abdulsalam M. Yakasai (2021) found that 12 weeks of resistance exercise program three times per week in PLWHIV produced a significant modulating effect on strength, balance parameters and gait velocity.<sup>18,19</sup>

As per Table 5, a statistically highly significant ( $p < 0.000$ ) difference was found in all domains of OPAQ from baseline to 8 weeks. This could be due to aerobic, strengthening and balance exercises have improved the performance for activities of daily living in PLWHIV. Laperriere et al (1990) has found significant reduction of anxiety and depression in HIV post aerobic exercises.<sup>20</sup>

Similar findings had been observed by Roubenoff and

Wilson compared (2001) & Gregory A. Hand, et al (2009) that moderate- to high-intensity combined aerobic and resistance exercise regimens were safe and beneficial in the HIV-infected population.<sup>21, 22</sup> Lack of control group was the limitation of the study. Also a gender wise effect of exercises on functional mobility and quality of life in PLWHIV could have been studied.

## CONCLUSION

Occupational therapy intervention was helpful in bringing a positive change in the quality of life of HIV positive individuals. Also, a balance training exercises had reduced the risk of fall and improved functional mobility in PLWHIV. Thus, it could minimize residual disabilities related to HIV.

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