Original Article

Does telephone intervention in the adherence to antiretroviral therapy in women with human immunodeficiency virus

Intervenção telefônica na adesão à terapia antirretroviral de mulheres com vírus da imunodeficiência humana

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Objective: to evaluate the impact of a telephone intervention on the adherence to antiretroviral therapy in women with human immunodeficiency virus. **Methods**: quasi experimental study, before and after, conducted in a specialized service with 19 women who live with the human immunodeficiency virus. The study was developed in four phases: recruitment; assessment of adherence to antiretroviral treatment, telephone intervention and reassessment of adherence. During three months of follow-up, eight calls were made to each participant, totaling 152 interventions. **Results:** there was a statistically significant improvement in the number of participants with adequate adherence (p=0.004) and in the mean of adherence scores (p=0.000) after the intervention. There was no significant impact on the immune status. **Conclusion:** telephone interventions aimed at women with human immunodeficiency virus developed during three months proved to be effective for improving adherence to treatment.
Descriptors: HIV; Clinical Trial; Medication Adherence; Telephone; Nursing.

Objetivo: avaliar o impacto de uma intervenção telefônica na adesão à terapia antirretroviral em mulheres com vírus da imunodeficiência humana. **Métodos:** estudo quase-experimental, antes e depois, realizado em um serviço especializado, com 19 mulheres que vivem com o vírus da imunodeficiência humana. O estudo desenvolveu-se em quatro fases: recrutamento; avaliação da adesão ao tratamento antirretroviral, intervenção telefônica e reavaliação da adesão. Durante três meses de acompanhamento, foram realizadas oito ligações por participante, totalizando 152 intervenções. **Resultados:** após a intervenção, houve melhora estatisticamente significativa no número de participantes com adesão adequada (p=0,004) e na média dos escores de adesão à terapia (p=0,000). Não houve impacto significativo no estado imunológico. **Conclusão:** intervenções telefônicas direcionadas às mulheres com vírus da imunodeficiência humana desenvolvida durante três meses mostrou-se eficaz para a melhoria da adesão ao tratamento.
Descritores: HIV; Ensaio Clínico; Adesão à Medicação; Telefone; Enfermagem.

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Introduction

Antiretroviral therapy has important positive impacts on the life expectancy and quality of life of people living with human immunodeficiency virus (HIV). Despite the benefits of pharmacological treatment related to reduced mortality and occurrence of opportunistic infections, its effectiveness depends on satisfactory adherence, implying a challenge for patients and professionals who provide care to this population[1].

Besides being a form of promoting the health of people with HIV, as it helps in the reestablishment of immune status and control of co-infections[2], adequate adherence to treatment is essential to prevent the transmission of the virus, since the chances of propagation are lower when viral load is undetectable[3].

Women are more likely to face problems in adhering to antiretroviral treatment when compared to men due to stigmas and limited social support[4]. More attention should be paid specially to childbearing aged women who have low adherence to treatment because of the risk of vertical transmission of the virus[5].

Thus, it is important to use tools to support the follow-up of women living with HIV, with a view to promoting access to health, strengthening the link between professional-patient and investigating possible difficulties in treatment adherence, with an incentive to develop educational actions directed to self-care.

Information and communication technologies as support for the care provided to people living with HIV have been considered effective in improving adherence to antiretroviral therapy. As advantages of these technologies, interaction, collaboration, low cost and the possibility of use in regions with limited human and material resources to provide care stand out[6].

Among these technological tools, the use of telephone, whether to make calls or send reminding messages about taking medicines, have had positive results to alleviate the difficulties experienced by people with HIV, mainly to reach optimal levels of adherence to antiretroviral therapy[2,7].

Thus, it is necessary to evaluate the effectiveness of telephone interventions in the national scenario in order to identify the potentialities and challenges related to the use of this tool by the health services. Nurses are members of the multi professional team that assists people living with HIV at the beginning of antiretroviral therapy or with treatment adherence difficulties. Therefore, studies with this approach may be instrumental for nurses in the possibility of using the telephone as an additional care technology.

The aim of this study was to evaluate the impact of a telephone intervention on the adherence to antiretroviral therapy among women with human immunodeficiency virus.

Methods

This is a pilot, quasi experimental study with assessment carried out before and after the intervention. In this type of research, the patients are their own control before and after the intervention[8]. We decided not to include a control group because it was a pilot study with a small number of participants carried out to evaluate the feasibility of using telephone calls to the target population and the suitability of the proposed instruments.

The research was carried out at a Specialized HIV Care Service in Fortaleza, CE, Brazil, from July to December 2015. This institution is part of the Unified Health System and a reference center that provides multi professional care, delivers antiretroviral drugs and carries out follow-up exams.

The sample consisted of 34 subjects selected from non-probabilistic (convenience) sampling, adopting the following inclusion criteria: having age equal to or greater than 18 years; being female; presenting a confirmed diagnosis of HIV infection; being undergoing antiretroviral therapy for more than a month; to have own telephone (home or mobile); being willing to receive pre-scheduled telephone calls.

The exclusion criterion consisted of evidence of

physical, mental or hearing impairment that limited the receipt of the intervention. During data collection, ten telephone numbers were invalid, there was one death and four dropouts; the final sample was composed of 19 subjects.

The study was developed in four phases: recruitment; assessment of adherence to antiretroviral treatment, telephone intervention and reassessment of adherence. Recruitment occurred in the waiting room of the investigated service, prior to the follow-up medical consultation. At the moment of recruitment, a socio-demographic characterization form and the "Questionnaire for assessing adherence to antiretroviral treatment" (CEAT-VIH) were completed. In order to respond to the research objective, the means of the antiretroviral therapy adherence scores were considered as the primary variable and the mean of CD4+ cell count and viral load were considered secondary variables.

The sociodemographic and clinical data form is a validated instrument[9] that investigates the following variables: sex, age, marital status, occupational situation, years of schooling, time of diagnosis, time of antiretroviral therapy use, number of pills ingested per day, viral load, CD4+ cell count.

Adherence to antiretroviral therapy was measured by the CEAT-VIH, an instrument validated and adapted for Brazil[10] composed of 20 items directed to the evaluation of the adherence to antiretroviral therapy, whose score is obtained by the sum of all items (minimum possible value is 17, and the maximum possible value is 89). For purposes of presenting the results, adherence was classified as adequate (gross score ≥ 75) or inadequate (gross score ≤ 74)[11]. The CEAT-VIH was used before and after the intervention to evaluate adherence scores.

The telephone follow-up lasted three months, with eight calls per participant, totaling 152 interventions. Telephone calls lasted ten minutes on average and were conducted by a researcher using a mobile phone. Calls were performed weekly in the first month and fortnightly in the second and third months.

The subject approached during the calls was directed by the following question: How was it to take the medication during the last week (facilities, difficulties, side effects)? If the patients provided positive feedback regarding antiretroviral use, they were congratulated and encouraged to continue taking medications correctly. If women reported difficulties with the treatment, the difficult factors were investigated and specific guidelines were offered. In addition, information about the risks of inadequate adherence to treatment was made available. At the end of each call, participants were asked if there were any doubts. The content of the calls and recommendations were based on the Handbook on Adherence to Treatment for People with HIV/Acquired Immunodeficiency Syndrome[12].

The data was entered in the *Microsoft Excel* 2007 software and exported to the statistical program R for Windows, version 3.3.2. To analyze the results, measures of central tendency (mean and standard deviation) were used. The Shapiro-Wilk test was applied to assess the normality of the quantitative data. The McNemar test was used to analyze the change in the classification of adherence after the intervention. We also performed a t-test for paired samples with the objective of comparing the adherence scores, CD4+ cell count and viral load before and after the intervention. Statistical significance was assumed when the p value was < 0.05 and the 95% confidence interval (α=0.05) was calculated.

The study complied with the formal requirements contained in the national and international regulatory standards for research involving human beings.

Results

Regarding the sociodemographic characterization of the 19 women with HIV, the prevalence was > 39 years (52.6%), active labor status (42.1%), schooling > 8 years (73.7%) and married status (52.6%). Regarding clinical aspects, the diagnosis time was > 5

years in 52.6% of the women (mean = 7.7; minimum time = 0.5; maximum time = 20.0), and the duration of antiretroviral therapy was > 3 years (63.1%) (mean = 5.4; minimum time = 0.2; maximum time = 11). In 52.6% of participants, the CD4+ cell count was > 500 cells/mm^3 (mean = 516.8; minimum = 106.0; maximum = 976.0; standard deviation = 238.9), and the undetectable viral load was ≤ 40 in 63.1% (mean = 59.1; minimum = 0; maximum = 844.0; standard deviation = 192.3). Regarding the number of antiretroviral pills taken per day, 73.7% reported taking four or more (mean=4; minimum=1; maximum=6) (Table 1).

Table 1 - Sociodemographic and clinical characterization of the 19 women with HIV who received telephone intervention

Variables	n(%)	*CI (95%)
Age (years)		
≤ 39	9 (47.4)	25.2-70.5
> 39	10 (52.6)	29.5-74.8
Marital status		
Single	2 (10.5)	1.8-34.5
Married	10 (52.6)	29.5-74.8
Other (divorced, separated, widow)	7 (36.9)	17.2-61.4
Occupational situation		
Active	8 (42.1)	21.1-66.0
Inactive	11 (57.9)	34.0-78.9
Schooling (years)		
≤ 8	5 (26.3)	10.1-51.4
> 8	14 (73.7)	48.6-89.9
Diagnostic time (years)		
≤ 5	9 (47.4)	25.2-70.5
> 5	10 (52.6)	29.5-74.8
Time of use of antiretroviral therapy (years)		
≤ 3	7 (36.9)	17.2-61.4
> 3	12 (63.1)	38.6-82.8
CD4+ cell count (cells/mm³)		
≤ 500	9 (47.4)	25.2-70.5
> 500	10 (52.6)	29.5-74.8
Viral load (copies/ml)		
≤ 40	12 (63.1)	38.6-82.8
> 40	7 (36.9)	17.2-61.4
Number of pills taken per day		
≤ 4	14 (73.7)	48.6-89.9
> 4	5 (26.3)	10.1-51.4

*Confidence interval

Regarding the classification of adherence to antiretroviral therapy before the intervention, most of the women presented inadequate adherence (n=13). After the intervention, the number of participants with adequate adherence (n=16) increased, and this change was statistically significant (p=0.004) (Table 2).

Table 2 - Classification of adherence to antiretroviral therapy before and after telephone intervention

Antes	After		Total
	Adequate	Inadequate	
Adequate	6 (31.6)	-	6 (31.6)
Inadequate	10 (52.6)	3 (15.8)	13 (68.4)
Total	16 (84.2)	3 (15.8)	

*McNemar test

Table 3 shows the means of adherence to antiretroviral therapy, CD4+ cell count and viral load before and after the telephone intervention. There was a statistically significant difference in adherence scores mean before and after the intervention (p = 0.000), from 69.4 (standard deviation = 6.6) to 78.0 (standard deviation = 4.0). However, there was no statistically significant difference in relation to the mean CD4+ cell count or viral load.

Table 3 - Means of adherence to antiretroviral therapy, CD4+ cell count and viral load before and after the telephone intervention

Variables	Before		After		p*
	Mean	SD	Mean	SD	
Adherence Scores	69.4	6.6	78.0	4.0	0.000
CD4+ cell count	472.3	208.3	567.8	208.4	0.096
Viral load	499.4	1142.7	514.7	2101.6	0.095

*t-test for paired samples; SD = standard deviation

Discussion

The reduced sample size and time of follow-up and the use of only one instrument to measure adherence to antiretroviral therapy are considered factors that interfere in the generalization of the findings and, therefore, a limitation of the study.

Regarding the contribution of this study, we can

affirm that the knowledge produced about the positive impact of telephone intervention in adherence to antiretroviral therapy in women with HIV demonstrates the importance of this strategy to be implemented in specialized care services as complementary care with a view to improving health monitoring.

The positive effect of telephone calls on the adherence to antiretroviral therapy has been corroborated by previous studies in Africa[2] and China[13]. However, the measurement of adherence was made through an indirect instrument, which is susceptible to memory bias and may offer imprecise information. Whenever possible, it is recommended to associate the use of this tool with complementary methods of measurement, such as pill counting and the use of devices for confirmation of self-reported adherence, in order to increase the accuracy of the evaluation[14].

During the calls, receiving information about medications and managing side effects provided the stimulus for establishing a new routine. According to research carried out in India, communication between patients and professionals motivates the adequate intake of antiretroviral drugs, as it may lead the patient to feel constrained to inform the professional of a negative treatment behavior[15].

We believed that in addition to treatment adherence, the intervention received increased social support. In this context, future research may include other secondary variables that have an indirect relationship with adherence to antiretroviral therapy, such as perceived social support, quality of life and self-efficacy in relation to treatment.

In the present study, one of the main difficulties for the telephone intervention was the impossibility of completing the call due to invalid telephone numbers, a situation also found in another research[16]. One of the alternatives to solve this problem would be to request the telephone contact of another person, family member or friend who knows of the diagnosis. Yet, another option is to offer a mobile phone for each patient[17], which is a less viable intervention in the national scenario due to the high cost though. Attention

at the moment of collecting information of patients and continuous cadastral updating is emphasized.

Another factor associated with discontinuation of telephone follow-up was the possibility of loss of privacy and confidentiality on the diagnosis at the moment of the call, evidenced by the fear of disclosing the HIV diagnosis, a situation also seen in other studies[15,18]. In this case, it is important to ponder the interest and the available hours of patients to receive telephone calls.

After the telephone intervention, no statistically significant change was observed in relation to CD4+ cell count and viral load, a similar result found in two other clinical trials[2,13]. This finding may be associated with several factors, such as long period of use of antiretroviral therapy, good immunological status before intervention, reduced intervention time and follow-up time of the participants.

The follow-up time in the present study was three months, a short period for evaluation of biological markers of HIV progression; evidence suggests that measurements of these markers should be performed within periods of 12 months or more, for checking the maintenance of the positive results of the treatment[6].

In the present study, the majority of participants had a treatment time of more than five years. A clinical trial in China showed high adherence to antiretroviral therapy among patients who were at the beginning of treatment after a three-month telephone intervention[19]. Thus, we can state that telephone intervention is an effective strategy both for patients starting treatment and for those who have used antiretroviral therapy for longer times.

Conclusion

Telephone intervention brought significant impacts on the average adherence to antiretroviral therapy, but did not influence CD4+ cell count and viral load. The results demonstrated the potential of this toll in complementarity to the usual care performed in specialized HIV care services, as a way to promote adequate adherence to the use of antiretrovirals.

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Collaborations

Pedrosa SC, Galvão MTG and Vasconcelos BA contributed to the design of the project, writing the article, critical review of relevant intellectual content, analyses and discussion of results. Lima ICV contributed to the writing of the article and critical review of relevant intellectual content. Cunha GH and Pereira MLD contributed to the final approval of the version to be published.

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