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Psychometric properties of moore version of World Health Organization's Quality of Life (WHOQOL) HIV-BREF in persons living with HIV in Burkina Faso

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This study aims to examine psychometric properties of Moore version of World Health Organization's Quality of Life assessment short instrument in HIV patients (WHOQOL HIV-BREF). A study was conducted on 100 persons living with human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) in Ouagadougou, Burkina Faso. The internal consistency was evaluated using Cronbach's α. For the convergent validity of the Moore version WHOQOL-HIV BREF, the satisfaction with life scale (SWLS) was used as a comparison instrument and cross-product correlations were calculated. The test-retest reliability was assessed using the interclass correlation coefficient. The study showed high internal consistency with Cronbach's α at 0.92 for the whole instrument. According to domains, Cronbach's α found ranged from 0.58 to 0.87, showing acceptable internal consistency for all domains. Domains scores for test-retest reliability, using interclass correlation gave coefficients ranged from 0.40 (spiritual domain) to 0.99 (level of independence domain) with $p < 0.001$ for all domains except for spirituality domain ($p < 0.05$). The study showed significant correlation between general facets and quality of life score ($p < 0.001$), as wheel as WHOQOL HIV-BREF and satisfaction with life scale ($p < 0.01$) except for spirituality domain. The instrument demonstrated good discriminative properties according to clinical stages of HIV infection with higher scores for asymptomatic HIV patients and lower scores at AIDS stage ($p<0.001$), except for spirituality domain ($p > 0.05$). As a demonstrated cross-cultural instrument, the WHOQOL HIV-BREF in its Moore version can be used for quality of life assessment in a routine way or longitudinal studies in Burkina Faso with persons living with HIV/AIDS.

Key words: Quality of life, WHOQOL HIV-BREF, Burkina Faso, moore, psychometrics.

INTRODUCTION

Human immunodeficiency virus infection (HIV) remains the pandemic for which Africa pays the heaviest price, with more than two-third of people living with HIV. The introduction of highly active antiretroviral treatment

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(HAART) in the mid 1990 gave hope to people living with HIV and countries with high HIV prevalence. In Burkina Faso, where the population is estimated at 17,812,961 inhabitants (CIA, 2013), the prevalence of HIV infection among the general population is estimated at 1.1% (INSD and ICF International, 2012), with wide variation across sub-groups. According to the United Nations Joint Program on human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS), 7100 new HIV cases were reported in 2011 in Burkina Faso (UNAIDS, 2012).

From an acute disease, HIV infection has today become a chronic disease with which infected persons can live longer (Hoffmann et al., 2007), due to the availability of medical treatment through the HAART. Starting treatment early increases the average life expectancy of people living with HIV, and consequently reduces morbidity and mortality rate among infected persons (O'Connell and Skevington, 2012). This increase in the life expectancy has become a subject of tremendous interest, and therefore underlines the need to assess the quality of life of people living with HIV (O'Connell and Skevington, 2012). Several instruments have been developed to measure such quality of life. Instruments are developed in a particular cultural context, usually the Western context, and then translated from English to other languages. Some aspects of these instruments are adapted to Western context but cannot be transposed to other contexts.

In order to solve this problem of the lack of transcultural instruments for the assessment of the quality of life of people living with HIV, the World Health Organization (WHO) developed a specific instrument. Six centers across the world participated in the validation process of the instrument, which gave birth to the WHO quality of life assessment instrument for persons living with HIV (WHOQOL-HIV) that includes 120 items (O'Connell et al., 2004). A Zimbabwe-based centre from Africa also participated in the validation process. Beside the WHOQOL-HIV, the WHO also developed a shorter version named WHOQOL-HIV BREF for practitioners' routine use (O'Connell and Skevington, 2012).

The WHOQOL-HIV BREF had been translated from the original English version into several languages including French, which is the official language of Burkina Faso. The use of the French version (Marcellin et al., 2007) in the Burkinabe environment may encounter some difficulties due to the level of education of the population. Only 21.8% of the adult population of Burkina Faso can read and write (CIA, 2013), and only 1.3% of the Burkinabe population uses French as their main language. Moore is spoken by 50.5% of the Burkinabe population, followed by Fulfulde (9.3%) Goulmantchema (6.1%) and Dioula (4.9%) (INSD, 2008). Even in urban cities, despite a literacy rate of 57%, Moore still remains the main language of communication for 60.13% of the urban population, and only 5.25% of them communicate in French. Therefore, using the French language for the assessment of the quality of life of people living with HIV in Burkina Faso may cause some problems of understanding, even if the questionnaire is administered by an interviewer. The aim of this study was to translate the WHOQOL-HIV BREF to Moore, and also to assess the psychometric properties of the instrument.

MATERIALS AND METHODS

The instrument

As a shorter version of the WHOQOL-HIV, the WHOQOL-HIV BREF comprises 29 questions, exploring 29 facets of the quality of life, plus one question on the quality of life in general and another one on health in general, giving a total of 31 questions. Like the WHOQOL-HIV, the WHOQOL-HIV BREF explores six domains of the quality of life: physical, psychological, level of independence, social relationships, environment and spirituality. *The WHOQOL*-HIV BREF is used to ask respondents to rate themselves their quality of life during the two weeks preceding the interview, in many ways. Answers from 1 to 5 are presented on a Likert scale, where 1 indicates low or negative perception and 5 high or positive perception. The 29 questions exploring 29 facets of the quality of life are used to determine the score per domain and the overall score of the quality of life. The physical domain comprises 4 questions, the psychological domain 5 questions, the level of independence 4 questions, the domain of social relations 4 questions while the environmental domain is composed of 8 questions and spirituality 4 questions. Questions used in each domain explore specific facets of the quality of life. Scores are awarded according to recommendations of the World Health Organization's Quality of Life group (WHO, 2002). The score of a domain is obtained by multiplying the average score of questions in the domain by 4, resulting in a score ranging from 4 to 20. The higher the score obtained, the higher the quality of life in the domain. The overall score of the quality of life is obtained by the addition of the scores of domains, which gives a score that varies from 24 to 120. Higher scores imply better quality of life.

Translation process

Two independent professional translators who are native and fluent in Moore translated the English version of the WHOQOL-HIV BREF into Moore. Thereafter, the two translations were compared and a consensus was reached during a meeting attended by the two translators, an expert in transcription into national languages from the National Institute for Literacy and the chief investigator. Concepts and semantics of the original version were discussed and this gave rise to a first consensual version in Moore. It was then given to a 3rd translator, not familiar with the English or French version of the WHOQOL-HIV BREF, who was asked to translate it back from Moore into English. This last transcription was compared to the original version. In order to be sure of the comprehension of questions, tests were conducted with five volunteers under the supervision of the chief investigator. After minor adjustments, the final version was adopted.

Sampling

The study was conducted on a sample of 100 persons living with

HIV, recruited from the health facility of the Association of Youths for the Promotion of Orphans (AJPO in French). AJPO is a community-based organisation, which initially took care of orphans, and has extended its activities to the psychosocial and medical care of persons living with HIV. The sample size used for the study was determined based on the number of subjects to the number of items ratio, which varies from 3 to 10 according to authors (Everitt, 1975; Gorsuch, 1983; Nunnally, 1978). This study chose a ratio of 3, which gave 93 subjects for a 31-items instrument that was rounded to 100. Using a systematic sampling method, subjects were selected on their arrival to the health centre and were requested to submit themselves for the study. Out of the 100 subjects interviewed at baseline, 20 were re-interviewed two weeks later for a test-retest reliability assessment. This interval of two weeks appears to be neither too short nor too long to induce bias effects or provoke real changes (Fang et al., 2002). Gender, profession, marital status, scores of the quality of life, satisfaction with life scores, age and routes of HIV transmission were similar among the 80 unselected patients and the 20 selected patients for the retest interview.

Comparison instrument

In order to determine the convergent validity of the WHOQOL-HIV BREF Moore, the satisfaction with life scale (SWLS) (Diener et al., 1985) was used as a comparison instrument. It has been demonstrated to be a good instrument for the general assessment of the quality of life based on subject's own criteria (Diener et al., 1985; Shin and Johnson, 1978; Streiner and Norman, 2003). The SWLS is a scale with five questions and possible answers are presented on a Likert scale from 1 (strongly disagree) to 7 (strongly agree). Answers are used to calculate a single score of satisfaction with life. This score is obtained by the addition of the values of the five answers. The score can vary from 5 to 35. The higher the score obtained, the greater the degree of satisfaction with life. The satisfaction with life scale was translated from English into Moore with good psychometric properties.

Data collected

In addition to issues related to the quality of life and satisfaction with life, socio-demographic and clinical data on the subjects were also collected: age, sex, profession, educational level, marital status, clinical stage, transmission routes of HIV and HAART status. The questionnaire was handled by two trained interviewers, fluent in Moore in order to solve the problem of illiteracy of interviewees and avoid unanswered questions.

Statistical analysis

Data obtained on the field were analysed with IBM SPSS 19.0. The internal consistency of the questionnaire's domains was evaluated using Cronbach's α for assessing the correlation between items. The closer the Cronbach's α is to 1, the better the internal consistency of the questionnaire. To determine the convergent validity of the instrument, cross-product correlations between the domains' scores of the quality of life were calculated, as well as correlations between the quality of life scores and satisfaction with life scores or general facets. Discriminant validity was assessed by comparing the scores across clinical stages of HIV using analysis of variance (ANOVA). The interclass correlation coefficient (ICC) was used to assess the test-retest reliability in assessing the stability of the instrument over time. The higher the coefficient, the better the reliability of the instrument. Groups were compared using ANOVA with a linear trend test or Student's t test for continuous variables, and Pearson's χ^2 or Fisher's exact p-values for discrete variables. A p-value lower than 0.05 was considered as significant.

Ethical concerns

This study is part of a wider study on the quality of life of persons living with HIV in Burkina Faso, which had been approved by the Ethics Committee for Health Research of the Ministry of Health of Burkina Faso. All those who agreed to participate in the study signed a free and informed consent.

RESULTS

Characteristics of subjects

The characteristics of the 100 recruited patients are presented in Table 1. The average age was 37.5 ± 7.7 years (mean ± SD), ranging from 23 to 56 years, and 81% of the subjects were women. Half of the respondents lived in union, while 58% were engaged in trading or are in the informal sector and 50% of the respondents were illiterate. Concerning the transmission routes of HIV, 63% of the infected people were reported to have contacted the disease through heterosexual intercourse while 28% of them attributed their infection to a malediction. No transmission through homosexual intercourse was reported (Table 1). The period between the first positive test and the starting of treatment was estimated at 2.9 ± 1.6 years. Most of the respondents (90%) have been on HAART for an average period of 3.6 ± 2.8 years, ranging from some months to 11 years. Patients obtained lower scores in the physical domain than in other domains. The psychological and spiritual domains recorded the highest scores. The overall score of the quality of life varied from 59.8 to 110.2 with a mean of 85.9 ± 13.5. The scores of the satisfaction with life ranged from 13 to 25 with a mean of 19 ± 2.9 (Figure 1).

Internal consistency

The internal consistency of the Moore version of the WHOQOL-HIV BREF showed a Cronbach's α of 0.92 for the whole instrument (Table 2). Cronbach's α within domains ranged from 0.58 for the spiritual domain to 0.87 for the level of independence.

Test-retest reliability

The test-retest reliability produced an interclass correlation coefficients of 0.40 for spiritual domain ($p < 0.05$), 0.66 for psychological domain ($p<0.001$), 0.69 for physical domain ($p < 0.001$), 0.71 social relations

Table 1. Socio-demographic and health characteristics of interviewees at baseline.

Characteristics (n=100)	Proportion (%)	Means±SD
Age (years)	-	37.4±7.7
23-24	3.0	-
25-29	14.0	-
30-34	24.0	-
35-39	23.0	-
40-44	15.0	-
45-49	14.0	-
50-59	7.0	-
Gender	-	-
Women	81.0	
Marital status	-	-
Single	23.0	-
Married	23.0	-
Divorced	4.0	-
Concubinage	27.0	-
Widowed	23.0	-
Profession	-	-
Trading and informal sector	58.0	-
Housewife	30.0	-
Public or private employee	5.0	-
Other	12.0	-
Education level	-	-
Primary school	37.0	-
Secondary school	13.0	-
Illiterate	50.0	-
Clinical stage of HIV	-	-
HIV asymptomatic	28.0	-
HIV symptomatic	49.0	-
AIDS	23.0	-
HIV transmission route	**-**	**-**
Heterosexual intercourses	63.0	-
Malediction*	28.0	-
Blood transfusion	7.0	-
Other**	2.0	-
HAART status	-	-
Under treatment	90.0	-

*Malediction: Misconception which attributes AIDS to a spell cast by someone. **Other: Injecting drug (1%), Delivery (1%).

($p < 0.001$), 0.76 for environmental domain ($p<0.001$) and 0.99 for level of independence ($p<0.001$). The ICC for the whole instrument was 0.94 ($p < 0.001$). Using the paired t test, no significant change was noted in the overall score

Table 2. Internal Consistency of WHOQOL-HIV BREF Moore domains (n=100).

Domain of quality of life	Cronbach's alpha
Physical	0.73
Psychological	0.74
Independence Level	0.84
Social Relationships	0.71
Environment	0.87
Spirituality	0.58
Overall score	0.92

Table 3. Correlation between Quality of Life domains and Satisfaction with Life Scale (n=100).

Domain of quality of life	Satisfaction with life
Physical	0.94*
Psychological	0.72*
Independence level	0.75*
Social relationships	0.68*
Environment	0.71*
Spirituality	-0.08
Overall score	0.84*

*P<0.01

score of quality of life (p=0.67).

Convergent validity

Correlations between the WHOQOL-HIV BREF Moore and the satisfaction with life scale moore (SWLS-5 Moore) are presented in Table 3. Good correlations were observed (from r=0.68 to r=0.94) in all domains but the spiritual domain didn't correlate with satisfaction with life. The overall score of the quality of life highly correlated with the satisfaction with life. Furthermore, after comparing domains of the quality of life with the two general facets (quality of life in general and health in general), a significant positive correlation with the overall score of the quality of life and scores of domains (from r=0.52 to r=0.90) was observed, except in spiritual domain that had a correlation close to zero (p=0.40). Correlations varied from 0.65 (psychological domain vs. social relations domain) to 0.84 (psychological domain vs. independence domain) across domains of the quality of life. Only spiritual domain didn't correlate significantly with other domains of the quality of life.

Discriminant validity

Taking into account the clinical stages of HIV infection, the WHOQOL-HIV BREF Moore showed good discriminant validity (Table 4). Indeed, all, except spiritual domain, showed a significant difference in the analysis of variance, with higher scores for asymptomatic HIV subjects and lower scores in patients at AIDS stage. Moreover, regardless of the clinical stages, the lowest scores were recorded in physical domain and the highest scores in spiritual domain, with the exception of asymptomatic patients where the highest score was recorded in the domain of independence.

DISCUSSION

The present study followed recommended procedures for psychometric instruments translation and validation, with translators and linguists involved in the whole translation process. In this study, the Cronbach's α of the overall instrument was 0.92, which is close to those previously found in the WHOQOL-HIV instruments validation. Saddki et al. (2009), while validating, in 2009, the Malay version of the WHOQOL-HIV BREF with 157 HIV patients found the same Cronbach's α.

The same result was found by Fang et al. (2002) in their validation study of the Taiwanese version of the WHOQOL-HIV in 2002. According to Nunnaly (1978), in an exploratory study such as the present study, the value of the Cronbach's α ranging between 0.50 and 0.60 can

Table 4. Quality of life according to clinical stages of HIV (means±DS).

Domain of Quality of Life	Clinical Stage			P-value*
Physical	15.2±1.2	11.3±1.9	8.3±1.4	<0.001
Psychological	18.2±1.2	15.3±1.8	12.5±1.8	<0.001
Independence Level	18.5±0.9	14.9±1.6	13.7±1.9	<0.001
Social Relationships	17.7±1.8	13.4±2.9	10.6±2.3	<0.001
Environment	16.8±1.5	12.8±2.4	10.1±0.9	<0.001
Spirituality	15.9±2.4	16.5±2.9	16.2±3.1	0.36
Overall score	102.4±4.1	84.3±7.5	69.4±6.3	<0.001

*Linear trend test in ANOVA.

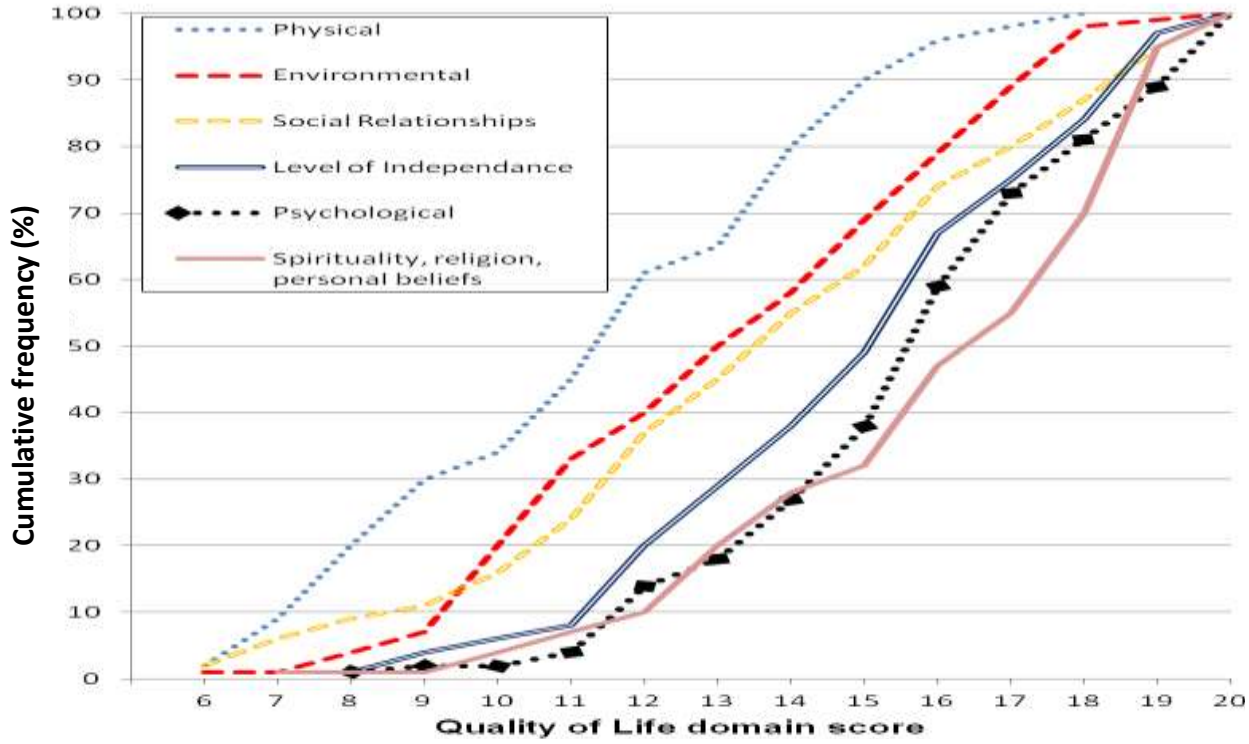

Figure 1. Cumulative frequency polygon of the quality of life domains scores (n=100).

be considered as acceptable while in confirmatory study, values have to be above 0.70 to be considered as acceptable. Depending on the domain of the quality of life, the Cronbach's α in this study ranged from 0.58 to 0.87. Except in spiritual domain where it was acceptable (α =0.58), other domains had Cronbach's α above 0.70, showing good internal consistency.

Peltzer et al. (2010), in their study on antiretroviral treatment adherence among 735 persons starting HAART in 3 public hospitals in Kwa-Zulu Natal, South Africa, had found a Cronbach's α of 0.88 for the whole questionnaire and values ranging from 0.46 to 0.72 according to domains. The original English version of the WHOQOL HIV-BREF showed Cronbach's α ranging from 0.69 to 0.82 for domains (O'Connell and Skevington, 2012). Préau et al. (2007) in a study conducted on 72 persons in a hospital's department, specialised in HIV care in France, found Cronbach's α that varies from 0.47 to 0.78 according to the domain, with the lowest α corresponding to the spiritual domain. The lowest α found in this study corresponds to the spiritual domain. In a validation study of the European Portuguese version of the WHOQOL-HIV BREF in 1196 persons living with HIV in 10 Portuguese hospitals across Portugal from 2007 to 2008, Canavarro and Pereira (2012) also found the lowest value in spiritual domain (alpha=0.60). Such

results suggest more investigation in the relationship between the quality of life and spirituality, religion practices and beliefs of people in this country.

The test-retest reliability was conducted to assess the stability of the WHOQOL-HIV BREF Moore over time using interclass correlation coefficient (ICC). Considering the 80 subjects who were not re-interviewed, this study found that there was no significant difference between this group and the 20 patients who were re-interviewed, regarding the quality of life scores at baseline but a significant difference was noted in the level of education ($p < 0.01$). The results of this study however, showed good validity because the two groups were comparable in terms of scores obtained in the quality of life at baseline**.** Whatever the domain of the quality of life, there was a significant positive correlation between scores recorded at the baseline for the 20 subjects and those recorded two weeks later, with the lowest correlation corresponding to the domain of spirituality (ICC=0.40). These results are in conformity with what was expected. Comparing the WHOQOL-HIV BREF Moore to the satisfaction with life scale (SWLS-5 Moore), this study showed a significant positive correlation when considering the overall score or domain scores, except in spiritual domain.

A good positive correlation was observed between the two general facets of the WHOQOL-HIV BREF Moore and the overall score and domain scores except in the spiritual domain. These results are consistent with previous validation studies that used the World Health Organization's instruments for the assessment of the quality of life (Chandra et al., 2006). This study showed that the WHOQOL-HIV BREF Moore has good discriminative qualities depending on the clinical stages of the HIV infection. Also, the discriminant validity of this study series recorded significant higher scores in asymptomatic subjects than in symptomatic patients or in those at AIDS disease stage. In their studies, Chandra et al. (2006) as well as Canavarro et al. (2011) highlighted good known groups validity with the application of the CD4 count subgroups.

This study didn't use CD4 counts because they were not available, despite the recommendation to assess CD4 counts every six months in the follow-up of patients living with HIV under treatment (CNLS-IST/BF, 2008). In this study sample, 52% of patients had CD4 results in their medical record, and only 8% had updated data. This could explain the reason for the low score recorded in the physical domain. The realisation of biological tests still remains one of the problems facing persons living with HIV in spite of the free access to treatment (Kouanda et al., 2010). However, the CD4 counts and viral load are good indicators for the assessment of the quality of life of persons living with HIV/AIDS and can help in medical treatment adjustments (Bruchon-Schweitzer and Quintard, 2001).

Regarding the various transmission routes, 28% of respondents ascribed their infection to malediction. Despite awareness campaigns on HIV and its transmission routes, more than one quarter of the respondents linked their infection to a magico-religious origin (Andrews and Boyle , 2011), instead of the natural history of the disease. This can partly be explained by the itinerary followed by a person living with HIV before he starts attending a medical centre of the National Health System. Very often, patients start with traditional medicine before going to a health centre of the National Health System for consultation. Such use of traditional treatment at the initial stage had been highlighted in the study of Bila et al. (2008). This study showed high scores in the spiritual domain while Saddki et al. (2009) found low scores in that domain. Traditionally known as strong believers, Burkinabe generally express strong faith in unsecured situations when they are faced with chronic diseases or social problems. Indeed, 99.6% of the Burkinabe populations practice different religion: Muslims (60.5%), Christians (23.2%) and Animists (15.3%) (INSD, 2008). Religious practices of this study subjects could explain the high scores recorded in spiritual domain, since religions recommend the seeking of heaven's wellbeing instead of earthly happiness.

The present study, the AJPO's health Centre because of their perfect organization, and their acceptance to host the study was chosen. This centre may not be representative of all HIV health facilities in the whole country, and this can limit the perspective of this study. However, after comparing the study sample with the sample used for Demographic and Health Study in 2010 (INSD and ICF International, 2012), the study found the same structure, with a similar proportion under 35 years.

CONCLUSION

The study demonstrated that it is possible to construct scores of the quality of life of persons living with HIV in Burkinabe environment, using an instrument which showed good psychometric properties. Therefore, the WHOQOL-HIV BREF Moore can be used to assess the quality of life of persons living with HIV in Burkina Faso.

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Conflict of interest

The authors declare that they have no conflicts of interest.

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