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ORIGINAL ARTICLE

Health-related quality of life in people with HIV from the multicentre CoRIS cohort in Spain: Associated factors and short-term changes over time

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Abstract

Objectives: We aimed to describe health-related quality of life (HRQoL), overall and across its dimensions, identify associated factors, and assess changes over time among people with HIV (PWH) from the Spanish multicentre CoRIS cohort.

Group authorship: Centres and investigators involved in the CoRIS cohort are listed in Appendix 0.

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Methods: We developed a mobile app to collect HRQoL data every 3 months using the WHOQOL-HIV-BREF questionnaire (31 items across six domains), among PWH followed in CoRIS in 2021–2023. Factors associated with good/very good global HRQoL and with domain-specific mean scores were identified using multivariable logistic and linear regression, respectively.

Results: Of 414 PWH (94.2% on antiretroviral treatment, 91.1% virally suppressed), 51.2% reported good/very good HRQoL. Latin American migrants (adjusted OR: 0.60 [95% CI: 0.36; 1.00]), and participants with lower educational level (0.36 [0.21; 0.64]), a previous AIDS diagnosis (0.56 [0.29; 1.11]) and a history of non-AIDS-related cancers (0.40 [0.14; 1.14]) were less likely to report good/very good global HRQoL. The most affected items included sexual satisfaction, forgiveness and blame, sleep and rest, and concerns about the future, with spirituality, religion and personal beliefs as the most affected domain. Latin American origin, lower educational level and shorter (<2 years) or longer (>15 years) time since HIV diagnosis were associated with poorer HRQoL in specific domains. No significant changes in HRQoL were observed after 12 months except slightly higher scores in physical health.

Conclusions: Only half of PWH reported good/very good global HRQoL. This highlights the need to develop targeted strategies to improve HRQoL among PWH, focusing on addressing the most affected dimensions and supporting the most vulnerable groups.

KEYWORDS
HIV, patient-reported outcome measures (PROMs), patients, health-related quality of life (HRQoL), risk factors, World Health Organization HIV Quality of Life Instrument (WHOQOL-HIV-BREF)

INTRODUCTION

The widespread access to antiretroviral treatment (ART) has significantly increased the life expectancy of people with HIV (PWH) [1], and has transformed HIV infection into a manageable chronic condition [2]. However, despite these advances, PWH often report lower health-related quality of life (HRQoL) compared with both the general population [3–5] and individuals with other chronic conditions [6]. As a result, improving HRQoL of PWH and promoting person-centred healthcare have become key priorities for clinicians, researchers and policymakers [7, 8]. This focus is reflected in the latest global health strategy on HIV from the World Health Organization (WHO), which also highlights the importance of monitoring HRQoL among PWH [9].

In this context, there is a growing interest worldwide, particularly in high-income countries, in utilizing validated patient-reported outcomes measures (PROMs) to assess the self-reported HRQoL of PWH in clinical settings [10]. A recent meta-analysis has shown that a variety of instruments are used to assess HRQoL in PWH, the World Health Organization HIV Quality of Life Instrument (WHOQOL-HIV) being the most widely used [11]. The WHOQOL-HIV effectively addresses HIV-specific health concerns by including items related to death, stigma, and blame for HIV status, which are unique to HIV-specific instruments compared with generic QoL tools like the 36-Item Short Form Health Survey questionnaire (SF-36) and EuroQoL-5D (EQ-5D) [11]. Furthermore, the availability of the WHOQOL-HIV in over 20 languages underscores its widespread use across diverse cultural contexts [11].

In Europe, the percentage of PWH reporting good HRQoL ranges between 63% to 76% [12, 13], which falls significantly below the Joint United Nations Programme on HIV and AIDS (UNAIDS) target of achieving 95% for good HRQoL [14]. Factors that may influence HRQoL in PWH include socioeconomic status, immunological status, presence of symptoms, comorbidities, social support and adherence to ART [15, 16]. However, the specific impact and relative importance of these factors are not yet fully understood. Furthermore, HRQoL evolves over time, and this evolution can be affected by disease progression, adherence to ART and psychosocial interventions. Understanding these dynamics is essential for enhancing the comprehensive care provided to PWH. To our knowledge, no study to date has examined the evolution of HRQoL under real-life conditions. In Spain, most research on HRQoL in PWH has been limited to single-centre studies, primarily using the generic EQ-5D-5L tool [17–20], which may lack the sensitivity of HIV-specific PROMs designed to capture key aspects of HRQoL, such as stigma, relationship challenges and comorbidities [21]. Only four studies have assessed HRQoL using the HIV-specific instrument WHOQOL-HIV-BREF questionnaire at the national level: two focus on older PWH [22, 23], one reports data from 2016 to 2017 [24] and another examines the impact of a peer intervention on the HRQoL of people recently diagnosed with HIV [25].

The aims of our study were: (i) to describe the HRQoL, both overall and across its dimensions, using the WHOQOL-HIV-BREF questionnaire, (ii) to identify associated factors and (iii) to assess changes over time among PWH from the nationwide multicentre CoRIS cohort in Spain during the period 2021–2023.

METHODS

Study design and study population

This study was conducted between June 2021 and June 2023 within the framework of the Spanish CoRIS cohort. CoRIS is a prospective multicentre cohort comprising adult PWH, naive to ART at study entry, recruited since 1 January 2004 in 48 centres from 14 autonomous regions in the Spanish public healthcare system. CoRIS gathers a comprehensive dataset that includes baseline and follow-up sociodemographic, immunological and clinical data, along with data on antiretroviral medications. The data are highly standardized and subjected to annual quality control procedures. Participants undergo periodic follow-ups in line with routine clinical practice. A detailed description of the CoRIS cohort can be found elsewhere [26].

Eligible individuals were any PWH in active follow-up in CoRIS who attended their outpatient clinic during the study period.

Data collection procedure

We designed and implemented a mobile app to routinely collect, every 3 months, data on HRQoL measured through the self-reported WHOQOL-HIV-BREF questionnaire validated in Spanish [16]. The questionnaire comprises 31 items: 1 on global HRQoL, 1 on general health satisfaction and 29 covering six domains: physical health, psychological health, level of independence, social relationships, environmental health and spirituality, religion and personal beliefs (SRPB). Each item is rated on a five-point Likert scale, where 1 denotes very poor and 5 very good. For each domain, scores range from 4 to 20. Higher scores denote higher HRQoL.

HIV healthcare providers explained the study to the eligible participants and invited them to participate. Those who agreed were provided with an informed consent form to sign and a link to download the mobile app for smartphones and tablets through which they could answer the online version of the questionnaire. The average time to complete the questionnaire was 5 min.

The information on sociodemographic and clinical variables at the time of completion of the first questionnaire, hereafter referred to as baseline, was obtained from the CoRIS database. Sociodemographic and clinical variables considered included sex at birth (male, female, unknown), age (<35, 35–49 and ≥50 years), transmission category (homo/bisexual contact, heterosexual contact, other/unknown), region of origin (Spain, Latin America, other, unknown), educational level (upper secondary/university, no education/compulsory education, unknown), time from HIV diagnosis (<2, 2–15, >15 years), previous AIDS diagnosis (no, yes, unknown), CD4+ T cell count (≥350 cells/μL, <350 cells/μL, unknown), viral load ≤50 copies/mL (no, yes, unknown), years on ART, type of ART regimen (two nucleoside reverse transcriptase inhibitors + one integrase inhibitor, two nucleoside reverse transcriptase inhibitors + one non-nucleoside reverse transcriptase inhibitor, two nucleoside reverse transcriptase inhibitors + one protease inhibitor, dual therapy with dolutegravir plus lamivudine or rilpivirine, other combinations, unknown) and presence of comorbidities (diabetes, chronic heart disease, liver cirrhosis, history of non-AIDS-related cancer, chronic kidney disease).

Statistical analysis

Descriptive analysis was conducted using frequency tables for categorical variables and median and interquartile range (IQR) for continuous variables. We calculated the percentage (95% confidence interval [95% CI]) of individuals rating good/very good global HRQoL and of those being satisfied/very satisfied with health, overall and according to sociodemographic and clinical characteristics at baseline, and used multivariable logistic regression models to identify independently associated risk factors. For each item and domain of the WHOQOL-HIV-BREF questionnaire we calculated means and 95% CI and used multivariable linear regression models to identify factors associated with mean scores of each domain. Among the subset of individuals with information of HRQoL both at baseline and at 12(±6) months, we calculated mean changes (95% CI) for each specific domain.

All statistical analyses were performed using Stata® software (version 17.0; Stata Corporation, College Station, TX, USA).

Ethics approval and informed consent

CoRIS cohort was approved by the Clinical Research Ethics Committee of the Gregorio Marañón General University Hospital. All patients consented to join CoRIS and to participate in this study by signing both informed consent forms. This particular study received approval from the Clinical Research Ethics Committee Carlos III Health Institute, Madrid, Spain (CEI PI 52 _2020-v2_Enmienda 2020-v2).

RESULTS

Participants' characteristics

Table 1 shows the characteristics of the 414 individuals from 21 centres included in the analyses. Of these, 91.3% were male, and the median age was 43.9 (IQR: 36.2; 51.6) years. The reported mode of HIV acquisition was homo/bisexual intercourse in 81.2% of individuals, 56.3% were from Spain and 74.2% had upper secondary or university education. The median time from HIV diagnosis was 7.3 (IQR: 3.4; 12.1) years, 11.1% had a previous AIDS diagnosis, the median CD4+ T cell count was 768 (IQR: 570; 1002) cells/μL and 91.1% were virologically suppressed. A total of 94.2% of participants were on ART for a median of 6.5 (IQR: 3.5; 10.3) years. Most individuals were receiving regimens consisting of two nucleoside reverse transcriptase inhibitors plus one integrase inhibitor (46.2%) or dual therapies with dolutegravir plus lamivudine or rilpivirine (31.0%). Some 4.8% of participants had a history of non-AIDS-related cancer. The characteristics of the participants in this study were comparable to those of individuals under active follow-up in the entire CoRIS cohort (data not shown).

Global HRQoL and general health satisfaction: description and associated factors

Of 414 participants surveyed, 51.2% self-reported their global HRQoL as good or very good (Figure 1). Multivariable analyses showed that being of Latin American origin (adjusted OR: 0.60 [95% CI: 0.36; 1.00]; *p*-value = 0.051), having no education or only compulsory education (0.36 [0.21; 0.64]; 0.001), having a previous AIDS diagnosis (0.56 [0.29; 1.11]; 0.098) and having a history of non-AIDS-related cancer (0.40 [0.14; 1.14]; 0.086) were associated with a lower chance of rating a good/very good global HRQoL (Table 2).

Some 64.7% of participants were satisfied or very satisfied with their health (Figure 1). Multivariable analyses indicated that having no or compulsory education (0.41 [0.24; 0.71]; 0.002) and a CD4+ T cell count of <350 cells/μL (0.39 [0.17; 0.91]; 0.030) were associated with a significantly lower likelihood of being satisfied/very satisfied with health (Table 2).

HRQoL-specific domains: mean scores and associated factors

Mean scores for each item and domain of the WHOQOL-HIV-BREF are shown in Figure 2. The items with the lowest scores were sexual satisfaction (mean: 3.1 [95% CI: 3.0; 3.2]), forgiveness and blame (3.1 [2.9; 3.2]), sleep and rest (3.2 [3.1; 3.3]) and concerns about the future (3.2 [3.0; 3.3]). In contrast, the items with the highest scores were mobility (4.4 [4.3; 4.5]), information for daily living (4.1 [4.0; 4.1]) and accessibility of health services (4.1 [4.0; 4.2]) (Figure 2a). Across domains, level of independence (15.4 [15.1; 15.7]) and environmental health (15.2 [15.0; 15.7]) showed the highest scores, while the SRPB domain presented the lowest score (13.4 [13.1; 13.8]) (Figure 2b).

Table 3 shows the adjusted mean differences in specific domain scores according to sociodemographic and clinical characteristics. Results from multivariable analyses showed that individuals born in Latin America had significantly poorer physical (adjusted mean difference: −0.87 [95% CI: −2.66; −1.09]), level of independence (−0.78 [−1.49; −0.06]), social (−1.04 [−1.87; −0.22]) and environmental (−0.98 [−1.59; −0.37]) HRQoL than those born in Spain. Having no or compulsory education was also associated with poorer psychological (−0.80 [−1.54; −0.07]), level of independence (−0.72 [−1.48; 0.05]) and environmental (−1.35 [−2.00; −0.70]) HRQoL compared with having upper secondary or university education. Compared with individuals who had been diagnosed

TABLE 1 Sociodemographic and clinical characteristics at baseline of 414 individuals included.

Characteristic	Value
Sex at birth, *n* (%)	
Male	378 (91.3)
Female	35 (8.5)
Unknown	1 (0.2)
Age, years	
Median (IQR)	43.9 (36.2–51.6)
<35	89 (21.5)
35–49	206 (49.8)
≥50	119 (28.7)
Transmission category, *n* (%)	
Homo/bisexual contact	336 (81.2)
Heterosexual contact	59 (14.3)
Other/Unknown	19 (4.6)
Region of origin, *n* (%)	
Spain	233 (56.3)
Latin America	103 (24.9)
Other[a]	75 (18.1)
Unknown	3 (0.7)
Educational level, *n* (%)	
Upper secondary/university	307 (74.2)
No education/compulsory education	71 (17.1)
Unknown	36 (8.7)
Time from HIV diagnosis, years	
Median (IQR)	7.3 (3.4–12.1)
<2	74 (17.9)
2–15	285 (68.8)
>15	55 (13.3)
Previous AIDS diagnosis, *n* (%)	
No	366 (88.4)
Yes	46 (11.1)
Unknown	2 (0.5)
CD4+ T, cells/μL	
Median (IQR)	768 (570–1002)
≥350	367 (88.6)
<350	30 (7.2)
Unknown	17 (4.1)
Viral load ≤ 50 copies/mL, *n* (%)	
Yes	377 (91.1)
No	22 (5.3)
Unknown	15 (3.6)
On ART, *n* (%)	
No	24 (5.8)
Yes	390 (94.2)
Years on ART, median (IQR)	6.5 (3.5; 10.3)
Type of ART regimen, *n* (%)	
2 NRTI + 1 integrase inhibitor	180 (46.2)
2 NRTI + 1 NNRTI	48 (12.3)
2 NRTI + 1 PI	10 (2.6)
Dual therapy: DTG plus 3TC or RPV	121 (31.0)
Other combinations	16 (4.1)
Unknown	15 (3.8)
Comorbidities, *n* (%)	
Diabetes	10 (2.4)
Chronic heart disease	12 (2.9)
Liver cirrhosis	0 (0)
History of non-AIDS-related cancer	20 (4.8)
Chronic kidney disease	5 (1.2)

Abbreviations: 3TC, lamivudine; ART, antiretroviral therapy; DTG, dolutegravir; IQR, interquartile range; NRTI, nucleoside reverse transcriptase inhibitor; NNRTI, non-nucleoside reverse transcriptase inhibitor; PI, protease inhibitor; RPV, rilpivirine.

[a] Other: 65 from Western European countries other than Spain, 6 from Eastern Europe, 1 from India, 1 from Australia and 2 from the Philippines.

with HIV for 2–15 years, those diagnosed for less than 2 years reported significantly lower psychological (−1.04 [−1.86; −0.21]) and SRPB (−1.43 [−2.47; −0.39]) scores, and those diagnosed for >15 years reported lower scores for psychological (−0.89 [−1.45; −0.03]) and social (−0.88 [−1.90; 0.14]) HRQoL.

Changes in HRQoL after 12 months

A total of 105 participants had information on HRQoL at 12 months after baseline. Those who reported HRQoL data at 12 months were similar to those who did not, except that they were more likely to be older and born in Spain. The percentage of individuals rating their global HRQoL as good/very good increased from 56.2% to 63.8% at 12 months from baseline (*p*-value = 0.131). However, the percentage of those being satisfied/very satisfied with their health remained similar at baseline (67.6%) and after 12 months (68.6%) (*p*-value = 0.828) (data not shown). Regarding the evolution of the scores of the different domains, we failed to find significant differences in the domain-specific mean scores at 12 months from baseline, except that we observed slightly higher scores in physical health (mean change: 0.48 [95% CI: 0.05; 0.90]; *p*-value = 0.029) (Table 4).

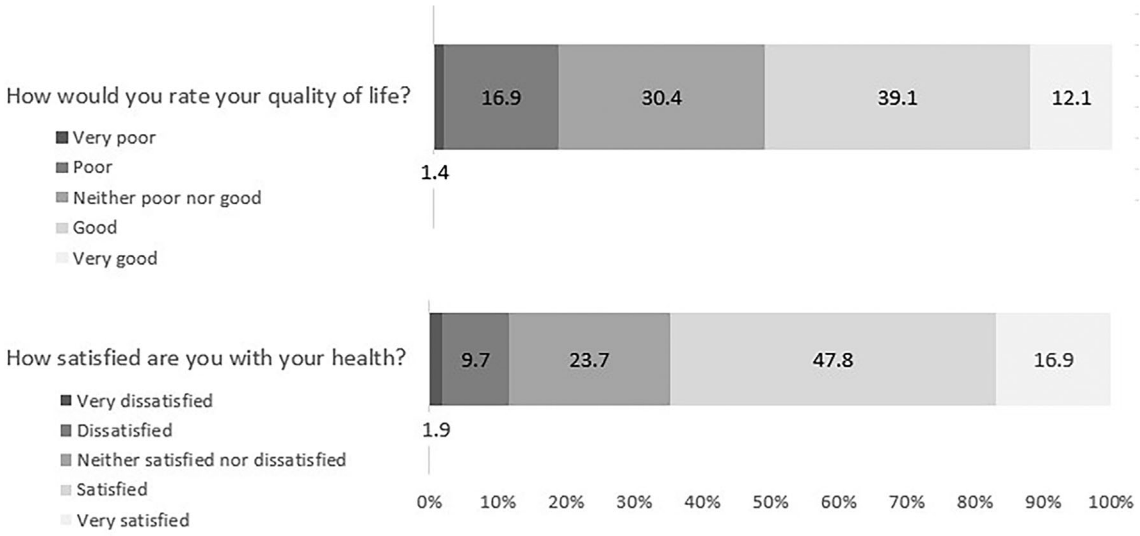


FIGURE 1 Distribution of participants' responses regarding their global health-related quality of life (HRQoL) and satisfaction with their health.

DISCUSSION

In the present study, around half of the PWH reported good or very good global HRQoL and nearly two-thirds were satisfied or very satisfied with their health. In contrast, nearly one in five participants reported poor or very poor quality of life, while one in nine expressed dissatisfaction or extreme dissatisfaction with their health. The most affected items included sexual satisfaction, forgiveness and blame, sleep and rest, and concerns about the future, with SRPB as the most affected domain. Additionally, participants from Latin America and those with lower levels of education showed poorer HRQoL globally and across most of the dimensions. Low satisfaction with health was specifically associated with having a lower level of education and a lower CD4+ T cell count. Changes in HRQL observed over a 1-year follow-up period were modest.

Compared with previous studies conducted in Europe using the WHOQOL-VIH-BREF, the percentage of participants in our study who self-reported good or very good global HRQoL was slightly lower [12, 13]. Additionally, health satisfaction in our study was similar to that found in France [12] and better than in Portugal [27]. These differences are probably due to variations in social support systems, healthcare access and societal attitudes towards HIV: these contextual factors can shape the way individuals experience and report HRQoL.

Sexual satisfaction and sleep quality were the most affected items in our study, consistent with findings from Spain and Finland using the same HRQoL scale [24, 28]. Previous studies have found that sexual dissatisfaction is common among men with HIV in Europe and is strongly linked to psychological and social well-being [29]. Additionally, poor sleep quality among PWH has been frequently reported, with anxiety, ART medication type, and family and social support identified as key factors influencing sleep quality [30].

The main factors associated with poorer global HRQoL and specific domains were Latin American origin and lower educational level. Latin American-born individuals had significantly poorer scores in physical, independence, social and environmental HRQoL compared with those born in Spain, which explains the association with worse global HRQoL. The reasons for this are probably complex and could be explained by cultural factors, lack of social or family support, the experience of immigration itself, or inequalities in access to health services, among others [31]. Although all residents in Spain have access to the national health system, difficulties and inequalities in access to health services have been found among migrants in Spain [32]. Similar to our study, foreign-born individuals in France reported lower physical HRQoL [12], whereas no significant differences by nationality in HRQoL domains were observed in Finland [13].

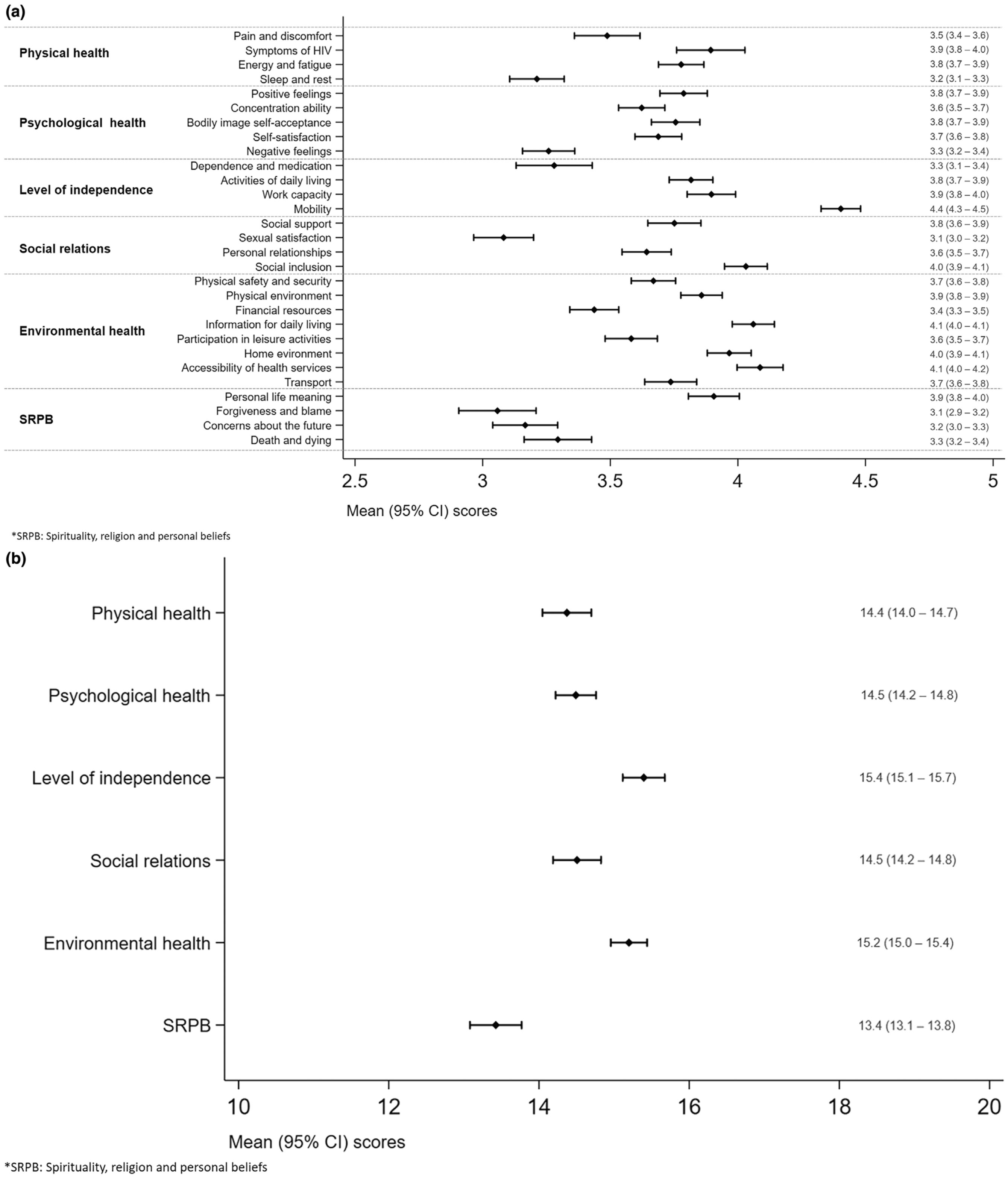
A recent meta-analysis identified education as a key social determinant of HRQoL among PWH [16]. The education level in our study was higher than that in the general Spanish population, in which 53.8% adults have upper secondary or university education [33]. Our study found that a higher educational level was associated with better scores in global HRQoL, health satisfaction and level of independence, psychological and environmental domains, consistent with prior research in Spain [24]. Similarly, studies in France and Georgia found that

TABLE 2 Odds ratios (95% CI) for the association between sociodemographic and clinical characteristics at baseline with good/very good global health-related quality of life (HRQoL) and with being satisfied/very satisfied with health.

	Good/very good global HRQoL					**Satisfied/very satisfied with health**				
		Univariable		**Multivariable**[a]			**Univariable**		**Multivariable**[a]	
Sex at birth	**n [%]**	**OR [95% CI]**	***P*-value**	**OR [95% CI]**	***P*-value**	**n [%]**	**OR [95% CI]**	***P*-value**	**OR [95% CI]**	***P*-value**
Male	197 [52.1]	1.00		1.00		243 [64.3]	1.00		1.00	
Female	15 [42.9]	0.69 [0.34; 1.39]	0.297	0.65 [0.25; 1.72]	0.390	24 [68.6]	1.21 [0.58; 2.55]	0.612	1.25 [0.45; 3.48]	0.670
Age, years										
<35	44 [49.4]	1.00		1.00		54 [60.7]	1.00		1.00	
35–49	113 [54.8]	1.24 [0.76; 2.04]	0.392	1.02 [0.57; 1.81]	0.951	138 [67.0]	1.32 [0.79; 2.20]	0.297	1.05 [0.58; 1.89]	0.872
≥50	55 [46.2]	0.88 [0.51; 1.52]	0.646	0.73 [0.36; 1.45]	0.361	76 [63.9]	1.15 [0.65; 2.02]	0.638	0.87 [0.43; 1.77]	0.697
Transmission category										
Homo/bisexual contact	172 [51.2]	1.00		1.00		214 [63.7]	1.00		1.00	
Heterosexual contact	28 [47.5]	0.86 [0.49; 1.50]	0.597	1.20 [0.55; 2.60]	0.650	41 [69.5]	1.30 [0.71; 2.36]	0.391	1.29 [0.57; 2.93]	0.540
Region of origin										
Spain	130 [55.8]	1.00		1.00		155 [66.5]	1.00		1.00	
Latin America	46 [44.7]	0.64 [0.40; 1.02]	0.060	0.60 [0.36; 1.00]	0.051	61 [59.2]	0.73 [0.45; 1.18]	0.199	0.79 [0.46; 1.35]	0.389
Other	36 [48.0]	0.73 [0.43; 1.23]	0.240	0.64 [0.36; 1.13]	0.122	49 [65.3]	0.95 [0.55; 1.64]	0.850	0.89 [0.49; 1.61]	0.696
Educational level										
Upper secondary/ university	169 [55.0]	1.00		1.00		206 [67.1]	1.00		1.00	
No education/ compulsory education	23 [32.4]	0.39 [0.23; 0.68]	0.001	0.36 [0.21; 0.64]	0.001	34 [47.9]	0.45 [0.27; 0.76]	0.003	0.41 [0.24; 0.71]	0.002
Time from HIV diagnosis, years										
<2	35 [47.3]	0.81 [0.48; 1.35]	0.414	0.70 [0.38; 1.30]	0.255	40 [54.0]	0.56 [0.33; 0.94]	0.029	0.61 [0.33; 1.15]	0.126
2–15	150 [52.6]	1.00		1.00		193 [67.7]	1.00		1.00	
>15	27 [49.1]	0.87 [0.49; 1.55]	0.631	0.95 [0.50; 1.81]	0.884	35 [63.6]	0.83 [0.46; 1.52]	0.556	0.86 [0.44; 1.66]	0.643
Previous AIDS diagnosis										
No	191 [52.2]	1.00		1.00		239 [65.3]	1.00		1.00	
Yes	19 [41.3]	0.64 [0.35; 1.20]	0.166	0.56 [0.29; 1.11]	0.098	28 [60.9]	0.83 [0.44; 1.55]	0.554	0.89 [0.44; 1.76]	0.727
CD4+ T, cells/μL										
≥350	193 [52.6]	1.00		1.00		244 [66.5]	1.00		1.00	
<350	12 [40.0]	0.60 [0.28; 1.28]	0.188	0.77 [0.33; 1.79]	0.539	11 [36.7]	0.29 [0.13; 0.63]	0.002	0.39 [0.17; 0.91]	0.030
Viral load ≤50 copies/mL										
Yes	194 [51.5]	1.00		1.00		245 [65.0]	1.00		1.00	
No	12 [54.5]	1.13 [0.48; 2.68]	0.778	1.62 [0.62; 4.23]	0.324	12 [54.5]	0.65 [0.27; 1.54]	0.323	0.82 [0.31; 2.19]	0.699
History of non-AIDS-related cancer										
No	206 [52.3]	1.00		1.00		256 [65.0]	1.00		1.00	
Yes	6 [30.0]	0.39 [0.15; 1.04]	0.060	0.40 [0.14; 1.14]	0.086	12 [60.0]	0.81 [0.32; 2.02]	0.650	1.05 [0.38; 2.92]	0.919

Abbreviations: CI, confidence interval; HRQoL, health-related quality of life; OR, odds ratio.

[a] Multivariable logistic regression models included sex at birth (male, female, unknown), age (<35, 35–49, ≥50 years), transmission category (homo/bisexual contact, heterosexual contact, other/unknown), region of origin (Spain, Latin America, other, unknown), educational level (upper secondary/university, no education/compulsory education, unknown), time from HIV diagnosis (<2, 2–15, >15 years), previous AIDS diagnosis (no, yes, unknown), CD4+ T cell count (≥350 cells/μL, <350 cells/μL, unknown), viral load ≤50 copies/mL (no, yes, unknown) and history of non-AIDS-related cancer (no, yes) at baseline.



*SRPB: Spirituality, religion and personal beliefs

*SRPB: Spirituality, religion and personal beliefs

FIGURE 2 Mean scores (95% CI) for each item (a) and domain (b) of the WHOQOL-HIV-BREF questionnaire.

higher education levels were associated with better general, social and environmental HRQoL [12, 34], while no such relationship was observed in Finland [13]. This finding may be explained by the fact that higher education levels often provide greater employment opportunities and social support, contributing to a more positive self-perception of HRQoL [34]. Additionally, in Spain, PWH from non-European countries and those with lower

TABLE 3 Adjusted mean differences in the domain scores of the WHOQOL-HIV-BREF questionnaire according to sociodemographic and clinical characteristics at baseline.

	Physical health		Psychological health		Level of independence		Social relationships		Environmental health		SRPB	
Characteristic	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value
Sex at birth												
Male	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Female	0.28 [−1.18; 1.73]	0.706	0.03 [−1.26; 1.31]	0.969	0.27 [−1.06; 1.60]	0.694	0.13 [−1.39; 1.65]	0.866	−0.38 [−1.51; 0.75]	0.509	0.59 [−1.04; 2.21]	0.477
Age, years												
<35	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
35–49	−0.09 [−0.96; 0.77]	0.829	0.35 [−0.41; 1.11]	0.365	−0.14 [−0.93; 0.65]	0.731	−0.21 [−1.12; 0.69]	0.643	0.37 [−0.29; 1.04]	0.273	−0.35 [−1.31; 0.61]	0.478
≥50	−0.29 [−1.32; 0.75]	0.588	0.17 [−0.75; 1.09]	0.715	−0.29 [−1.24; 0.65]	0.542	−0.78 [−1.86; 0.31]	0.162	0.22 [−0.59; 1.02]	0.594	−0.42 [−1.58; 0.73]	0.474
Transmission category												
Homo/bisexual contact	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Heterosexual contact	−0.21 [−1.38; 0.95]	0.717	0.27 [−0.76; 1.30]	0.603	−0.41 [−1.47; 0.66]	0.452	0.01 [−1.20; 1.23]	0.981	0.43 [−0.47; 1.34]	0.345	−0.26 [−1.55; 1.04]	0.696
Region of origin												
Spain	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Latin America	−1.87 [−2.66; −1.09]	<0.001	−0.19 [−0.88; 0.50]	0.591	−0.78 [−1.49; −0.06]	0.035	−1.04 [−1.87; −0.22]	0.013	−0.98 [−1.59; −0.37]	0.002	−0.90 [−1.77; −0.02]	0.045
Other	−2.75 [−3.62; −1.89]	<0.001	0.05 [−0.71; 0.81]	0.900	−0.08 [−0.87; 0.70]	0.833	−0.09 [−0.99; 0.81]	0.842	−0.18 [−0.84; 0.49]	0.601	−0.85 [−1.81; 0.11]	0.082
Educational level												
Upper secondary/ university	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
No education/ compulsory education	−0.43 [−1.27; 0.41]	0.313	−0.80 [−1.54; −0.07]	0.033	−0.72 [−1.48; 0.05]	0.065	−0.27 [−1.15; 0.61]	0.544	−1.35 [−2.00; −0.70]	<0.001	−0.23 [−1.16; 0.70]	0.628
Time from HIV diagnosis, years												
<2	−0.12 [−1.05; 0.82]	0.807	−1.04 [−1.86; −0.21]	0.014	−0.65 [−1.51; 0.20]	0.134	−0.08 [−1.05; 0.90]	0.880	−0.25 [−0.97; 0.48]	0.503	−1.43 [−2.47; −0.39]	0.007
2–15	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
>15	−0.60 [−1.58; 0.37]	0.224	−0.89 [−1.75; −0.03]	0.042	−0.69 [−1.58; 0.19]	0.125	−0.88 [−1.90; 0.14]	0.089	−0.52 [−1.27; 0.23]	0.176	−0.27 [−1.35; 0.82]	0.628
Previous AIDS diagnosis												
No	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Yes	−0.31 [−1.33; 0.71]	0.550	0.13 [−0.77; 1.02]	0.782	−0.32 [−1.25; 0.61]	0.501	0.55 [−0.52; 1.61]	0.314	−0.20 [−0.99; 0.59]	0.620	0.67 [−0.46; 1.80]	0.245
CD4+ T, cells/μL												
≥350	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
<350	−0.87 [−2.13; 0.40]	0.178	−0.17 [−1.29; 0.95]	0.766	−0.68 [−1.84; 0.47]	0.247	−0.49 [−1.82; 0.83]	0.463	0.48 [−0.50; 1.46]	0.336	−0.78 [−2.19; 0.63]	0.276

(Continues)

TABLE 3 (Continued)

Characteristic	Physical health		Psychological health		Level of independence		Social relationships		Environmental health		SRPB	
	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value	Mean difference [95% CI]	*P*-value
Viral load ≤50 copies/mL												
Yes	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
No	0.65 [−0.79; 2.09]	0.378	0.68 [−0.59; 1.95]	0.291	−0.19 [−1.51; 1.12]	0.772	0.67 [−0.84; 2.18]	0.384	0.20 [−0.91; 1.32]	0.720	0.70 [−0.91; 2.30]	0.394
History of non-AIDS-related cancer												
No	Ref.		Ref.		Ref.		Ref.		Ref.		Ref.	
Yes	0.33 [−1.16; 1.83]	0.663	−0.23 [−1.55; 1.10]	0.737	−1.02 [−2.39; 0.35]	0.144	0.29 [−1.27; 1.86]	0.714	−0.54 [−1.70; 0.62]	0.361	−0.26 [−1.93; 1.41]	0.758

Note: Multivariable linear regression models included sex at birth (male, female, unknown), age (<35, 35–49 and ≥50 years), transmission category (homo/bisexual contact, heterosexual contact, other/unknown), region of origin (Spain, Latin America, other, unknown), educational level (upper secondary/university, no education/compulsory education, unknown), time from HIV diagnosis (<2, 2–15, >15 years), previous AIDS diagnosis (no, yes, unknown), CD4+ T cell count (≥350 cells/μL, <350 cells/μL, unknown), viral load ≤50 copies/mL (no, yes, unknown) and history of non-AIDS-related cancer (no, yes) at baseline.

Abbreviations: CI, confidence interval; Ref., reference; SRPB, spirituality, religion and personal beliefs.

educational levels have been shown to have a higher risk of late presentation [35], which may lead to poorer global HRQoL and lower scores in specific domains for these vulnerable groups.

Regarding clinical factors, while a lower CD4+ T cell count was associated with a reduced health satisfaction, no significant associations were found between immunological or virological status and other HRQoL domains, consistent with studies from France, Finland and Portugal [12, 13, 27]. This may be attributed to advancements in prognosis and effective treatments that reduce psychological distress related to immunodeficiency [12]. In contrast, prior research has found that higher CD4+ T cell counts are associated with better levels of independence and physical HRQoL in Spain [24], whereas in Georgia, they are linked to improved scores in physical and environmental HRQoL as well as in the SRPB domains [34].

Our findings revealed lower psychological and SRPB scores among participants diagnosed with HIV less than 2 years ago, likely reflecting the need for an adaptation period following the initial emotional impact of the diagnosis [36]. In contrast, those diagnosed more than 15 years ago had poorer psychological and social HRQoL, which may be partly due to their diagnosis during a time of poorer prognosis [4] and an increased risk of age-related diseases [37], both of which may have adversely affected their HRQoL, mental health and social functioning. Similarly, a French study found that individuals diagnosed either recently or for over 5 years had poorer HRQoL than those diagnosed 2–5 years ago [12]. Conversely, while previous research in Spain reported negative correlations between HRQoL dimensions and years since diagnosis [24], no such correlations were observed in Finland [13]. Furthermore, previous European studies have identified associations between good HRQoL and being male, older and having an undetectable viral load [13, 24]. However, our results did not show a significant association with these factors.

Regarding changes in HRQoL over time, the observed variations were modest, with a slight increase in the proportion of individuals rating their global HRQoL as good or very good, along with improved scores in the physical domain at 12 months. These findings, which suggest that HRQoL remains relatively stable over a year of routine clinical follow-up, should be interpreted with caution, as only a quarter of the participants had HRQoL at 12 months. Long-term studies are needed to gain a more comprehensive understanding. Monitoring HRQoL progression could help healthcare providers in identifying areas requiring intervention and evaluating the impact of HIV management strategies.

Our study has several limitations. First, the generalizability of our results may be limited by potential selection

TABLE 4 Mean domain scores at baseline and after 12 months, and mean changes from baseline to 12 months.

	Mean [95% CI]			
Parameter	**Baseline**	**12 months**	**Mean change [95% CI]**	***P*-value**
Physical health	14.77 [14.20; 15.34]	15.25 [14.68; 15.82]	0.48 [0.05; 0.90]	0.029
Psychological health	14.42 [13.86; 14.99]	14.15 [13.55; 14.75]	−0.27 [−0.69; 0.15]	0.198
Level of independence	15.58 [15.00; 16.16]	15.32 [14.77; 15.88]	−0.26 [−0.74; 0.22]	0.291
Social relations	14.56 [13.87; 15.26]	14.65 [13.96; 15.34]	0.09 [−0.41; 0.58]	0.730
Environmental health	15.61 [15.10; 16.12]	15.65 [15.19; 16.12]	0.04 [−0.30; 0.38]	0.826
SRPB	13.50 [12.79; 14.20]	13.49 [12.83; 14.14]	−0.01 [−0.49; 0.47]	0.969

Abbreviations: CI, confidence interval; SRPB, spirituality, religion and personal beliefs.

and non-response biases; however, the study sample is representative of the individuals under active follow-up in the entire CoRIS cohort. Second, since both exposure and outcome variables were measured simultaneously, we were unable to assess the directionality of the associations. Third, due to the reduced number of participants with HRQoL data at 12 months from baseline, the results of the analysis on changes in HRQoL over time should be interpreted with caution. The main strengths of our study include the use of data from a national multicentre cohort, which is reasonably representative of new HIV diagnoses in Spain [38] and adheres to strict quality control criteria. To our knowledge, this is the first study to assess HRQoL evolution during routine HIV follow-up in a real-world setting. Our findings highlight the importance of integrating HRQoL measures into routine clinical practice, as this can enhance clinical decision-making, improve symptom recognition, facilitate patient–clinician communication, and help identify and address quality-of-life-related issues [39].

CONCLUSIONS

In conclusion, we have described overall HRQoL and its dimensions, identified associated factors, and assessed changes over time among PWH in a large multicentre cohort in Spain. We found that only half of the PWH reported good or very good global HRQoL, while nearly one in five reported poor or very poor HRQoL, falling significantly short of the target set by UNAIDS [14]. Sexual satisfaction, forgiveness and blame, sleep quality, and future concerns were the most affected items of HRQoL. Participants born in Latin America and those with lower educational level showed poorer global and specific HRQoL domains. These finding highlights the need to develop targeted strategies to improve HRQoL among PWH, focusing on addressing the most affected dimensions and supporting the most vulnerable groups.

AUTHOR CONTRIBUTIONS

All authors were involved in the setting up of the cohort and contributed to its design. All authors were involved in data collection. IJ asked the research question, designed the study and analysed the data. IJ and RI interpreted the data. RI and IJ wrote the first draft of the paper. All authors were involved in interpretation of the data and commented on interim drafts. All authors have read and approved the final draft.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article; further inquiries should be directed to the corresponding author(s).

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APPENDIX A

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