**Universidade do Minho**
Escola de Psicologia

André Ferreira Braga de Assis

# Mental Health and Risk Behaviors of Adolescents and Young Adults with Perinatal HIV: A Systematic Review of Literature

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Mestrado em Psicologia
Psicologia da Justiça
Trabalho efetuado sob a orientação da
**Professora Doutora Ângela Rosa Pinho Costa Maia**
**Professora Doutora Mariana Adelaide Vieira Gonçalves Costa**

junho de 2024

**Despacho RT - 31 /2019 - Anexo 3**

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**Acknowledgements**

These many years of academic challenges have proven to be much like running up a mountain—tiring, demanding, and everlasting. But up here, now finally nearing the top, I can look back at the path I've climbed and clearly see I wouldn't have made it this far without the motivation, inspiration, guidance, and support from the people I've both known and know.

I thank my father Rodrigo Braga de Assis, my mother, Luciana Macêdo Ferreira e Silva, and my sister, Clara Ferreira Braga de Assis, for always being there for me, pushing me along and steadying this steep path. You've made me who I am, and words will never express my gratitude for all you've given me, from the many opportunities and lessons to all the love and understanding I could have asked for. I would also like to thank my grandparents, who, even from far away, have shown me so much affection. I love you all and everything you have and will continue to do for me. This family has been my bedrock, even if sometimes I'm too cold to show it. I love you all dearly, who've been there since I couldn't yet walk, picking me up and putting me back on my feet. You've taught me how to run, and I'm eternally grateful.

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This work is an amalgamation of years of effort, and I dedicate it to all of you, who've carried me along. By now my feet are aching, but the view from up here is beautiful, and I'm glad to have shared it with all of you.

**Despacho RT - 31 /2019 - Anexo 4**

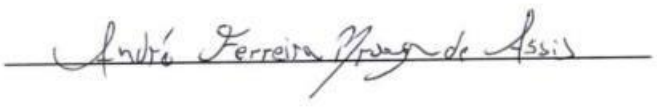
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(André Ferreira Braga de Assis)

Mental Health and Risk Behaviors of Adolescents and Young Adults with Perinatal HIV: A Systematic Review of Literature


## Abstract

Perinatal HIV infection (PHIV), transmitted from mother to child during has transitioned from a fatal to a chronic condition due to advancements in antiretroviral therapy (ART). This shift has created a unique population of adolescents and young adults facing numerous challenges, including mental health disorders and risk behaviors. This systematic review aims to evaluate and synthesize existing literature on the mental health and risk behaviors of adolescents and young adults with PHIV. Through the PRISMA guidelines, a search was conducted across four databases, and studies were included if they were empirical, quantitative, involved participants aged 9-29, and addressed mental health or risk behaviors in PHIV+ individuals. Exclusion criteria were applied to focus on relevant populations and study designs. The quality of included studies was assessed using the NIH Quality Assessment Tool. The search yielded 182 articles, with 23 meeting inclusion criteria after screening. PHIV+ adolescents and young adults are at elevated risk for mental health disorders such as depression, anxiety, and ADHD, and engage in high rates of risk behaviors, including substance use and unprotected sex, that impacts their quality of life. Despite this, their outcomes are not markedly worse than uninfected peers from similar backgrounds, possibly due to frequent healthcare interactions and targeted support. The unique challenges faced by PHIV+ individuals, particularly concerning quality of life and environmental stressors, warrant further research and tailored interventions to effectively support this vulnerable population.



*Keywords*: Perinatal HIV; mental health; risk behaviors; adolescents; young adults; systematic review; control group.

Saúde Mental e Comportamentos de Risco de Adolescentes e Jovens Adultos com VIH Perinatal: Uma Revisão Sistemática da Literatura


## Resumo

A infecção pelo HIV perinatal (PHIV), transmitida de mãe para filho, passou de uma condição fatal para uma condição crônica devido aos avanços na terapia antirretroviral (TAR). Essa mudança criou uma população única de adolescentes e jovens adultos que enfrentam inúmeros desafios, incluindo transtornos de saúde mental e comportamentos de risco. Esta revisão sistemática tem como objetivo avaliar e sintetizar a literatura existente sobre a saúde mental e os comportamentos de risco de adolescentes e jovens adultos com PHIV. De acordo com as diretrizes PRISMA, uma busca foi realizada em quatro bases de dados, e os estudos foram incluídos se fossem empíricos, quantitativos, envolvessem participantes com idades entre 9-29 anos e abordassem a saúde mental ou comportamentos de risco em indivíduos PHIV+. Critérios de exclusão foram aplicados para focar em populações e desenhos de estudo relevantes. A qualidade dos estudos incluídos foi avaliada utilizando a Ferramenta de Avaliação da Qualidade do NIH. A busca resultou em 182 artigos, dos quais 23 atenderam aos critérios de inclusão após a triagem. Adolescentes e jovens adultos com PHIV estão em risco elevado de transtornos de saúde mental como depressão, ansiedade e TDAH, e apresentam altas taxas de comportamentos de risco, incluindo uso de substâncias e sexo desprotegido, impactando sua qualidade de vida. Apesar disso, seus resultados não são significativamente piores do que os de seus pares não infectados de contextos semelhantes, possivelmente devido a interações frequentes com os cuidados de saúde e suporte direcionado. Os desafios únicos enfrentados por indivíduos com PHIV, particularmente em relação à qualidade de vida e fatores estressores ambientais, justificam mais pesquisas e intervenções personalizadas para apoiar efetivamente essa população vulnerável.



*Palavras chave*: HIV perinatal; saúde mental; comportamentos de risco; adolescentes; jovens adultos; revisão sistemática; grupo controle.

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# Mental Health and Risk Behaviors of Adolescents and Young Adults with Perinatal HIV: A Systematic Review of Literature

Perinatal HIV infection (PHIV) or vertical infection is characterized by the transmission of HIV from the mother to the child inside the womb, during childbirth, or through breastfeeding (Hoffmann et al., 2016), and recent data estimates that in 2022 as many as 130 000 children were born with the disease, though when compared to previous years, these numbers are steadily decreasing (UNAIDS, 2023).

Recently, PHIV has gone from a deadly disease to a chronic condition (ter Haar et al., 2022), an accomplishment achieved through the ease of accessibility and advancement of antiretroviral therapy (ART). This recent longevity to the life expectancy of these individuals has produced a unique and vulnerable population that faces a myriad of challenges due to their lifelong condition (Smith et al., 2019), which can result in neurocognitive, mental, physical, developmental, psychosocial, educational, and functional difficulties in these individuals' lives (Comley-White et al., 2021; Oliveira, 2022).

Furthermore, continuous ART treatment was found to have many side effects and neurotoxicity (Comley-White et al., 2021), which intertwined with on-going medical treatment, exposure to pain, hospitalization and sheltered life experiences, add much to the challenges faced by perinatally HIV-infected (PHIV+) individuals (Mellins et al., 2013).

Managing a chronic illness during the critical developmental stages of childhood and adolescence can profoundly impact this population's mental health, especially considering adolescence is already a time when mental health problems and behaviors that increase this impact may emerge (Copelyn et al., 2019). Unsurprisingly, studies evaluating the psychiatric functioning of PHIV+ have found they are at an elevated risk for a range of mental health disorders, including depression, anxiety, and attention deficit hyperactivity disorder (ADHD; Mellins et al., 2006). They have also been found to be more vulnerable to developing such psychiatric disorders when compared to healthy adolescents and young adults from similar sociodemographic and contextual risks (Nguyen et al., 2021).

Risk behaviors such as substance use and unprotected sex may be exacerbated by high levels of childhood adversity (Brittain et al., 2019), and these are prevalent among PHIV adolescents and young adults (Elkington et al., 2015). These behaviors not only compromise their health and well-being but also pose public health risks by potentially increasing the transmission of HIV (Koenig et al., 2010). Substance use and sexual experimentation are common and normative as adolescents age, but for PHIV+ these can be of higher risk due to impulsivity or judgement problems (Brittain et al., 2019).

Use of alcohol and other substances which are also associated with lesser adherence to treatment, were observed (Aurpibul et al., 2023b), as well as sexual risk taking (Kidman et al., 2018) and self-mutilation (Copelyn et al., 2019). Impulsivity, low self-esteem, anxiety, depression are all associated with self-harm, as well as all substance use, traits that have been identified in PHIV+ (Copelyn et al., 2019).

Adding to the health adversities faced by PHIV+ youths, many are economically vulnerable and socially marginalized, being emancipated minors or part of disadvantaged families, and some face health risks resulting from non-disclosure by parents who do not want to expose the child to stigma and marginalization (Fielden et al., 2010). The family may also encounter discrimination, social isolation, or grief for having lost a member of the family or friend (Louthrenoo et al., 2014).

PHIV+ have a mother who carried the virus, so parental illness and related mental health problems are expected. Many are orphans, which have shown to have higher probability of suffering sexual, physical, and emotional violence (Copelyn et al., 2019). Worryingly, childhood adversity has also been found to alter brain physiology, possibly causing social, cognitive, and emotional impairment that can disrupt their transition to adulthood (Kidman et al., 2018).

Self-stigma, perceived stigma, and discrimination are greatly damaging for PHIV+ individuals and have been associated with the development of many issues and poorer quality of life (Singh et al., 2018). HIV associated stigma has been found to exacerbate mental health challenges, with elevated perceived stigma being associated with higher depressive and anxiety symptoms, as well as alcohol use and poor adherence to treatment (Kang et al., 2011). The combination of poorer health and social instability can lead some to faulter in their formal education, which impacts their abilities to later function as independent adults in society (Aurpibul et al., 2023b).

Despite all the amounting data, studies evaluating and comparing PHIV+ with control groups of healthy individuals (HIV-), perinatally exposed but uninfected individuals (PHEU) and those who acquired the condition at an older age through behavioral means (BHIV+) have also found no significant differences in mental health or behavioral problems, suggesting a necessity of further analysis. Although most findings suggest that PHIV+ individuals are at increased risk and more vulnerable than their uninfected counterparts, some studies have found that, despite such adversities, they can present the same or less behavioral health problems as them, as well as no significant difference in rates of psychiatric disorders between them. These have been attributed to the presence of resilience in some of these individuals, which was found to be

promoted by parental supervision and communication, self-esteem, and low stigma internalization (Bhana et al., 2016).

HIV+ individuals are more prevalent than PHIV+ (UNAIDS, 2023), and research shows this reflects on the number of articles written for behaviorally acquired AIDS, for which there is a substantial more amount of data. It has been found that perinatally infected individuals have a bigger decrease in health when met with increasing depression and anxiety symptoms, when compared to behaviorally infected ones (Lynn et al., 2019) and that PHIV+ individuals face stigmas unique to their condition (Fielden et al., 2010). As the numbers of PHIV+ individuals increase over time, such differences, though not always present, suggest the necessity of further research and better understanding of their condition.

Given the complexities and disagreements of data on the mental health and risk behaviors of PHIV+, a thorough synthesis of existing literature on this topic and population can provide some valuable insights and help highlight objectives for future research. Therefore, this systematic review's objective is to methodologically evaluate and synthesize the current literature on the mental health and risk behaviors of PHIV+ adolescents and young adults and offer a comprehensive understanding of how the psychological disfunctions and resulting behavioral difficulties can affect this population's quality of life.

## Method

This systematic review was conducted according to the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) guidelines (Page et al., 2021), and prior to initiating the review process, the researcher completed and submitted the PROSPERO guideline to ensure adherence to established procedures. This step aimed to clarify the information sought, outline research objectives, and communicate the study's scope (protocol ID: CRD42024464967).

### Inclusion Criteria

To be included in this review, the articles needed to satisfy the following criteria: (a) empirical papers from quantitative methodology in English, Portuguese, or Spanish, containing data concerning PHIV+; (b) participants must be aged between 9 and 29 years old; and (c) have information concerning PHIV+ mental health and/or risk behaviors. It must be noted that children as young as 9 were considered adolescents,

since many of the studies concerning adolescents and young adults include 9-year-old children and older in their populations.

Studies with children (below 9 years old), with differing objectives to this review's, focused on another outcome than this review's, with wrong study design (qualitative or systematic review), or studies that did not separate PHIV from controls in their results were all excluded from this review.

## Search Strategy

A comprehensive search was conducted on specialized article databases, including Web of Science, PubMed, Scopus, and APA PsycArticles. The search employed relevant mesh terms to be sought in article's abstracts, determined by the researcher, and tested for appropriateness through iterative attempts. Search terms encompassed perinatal AIDS, mental health and risk behaviors, and age categories respectively separated by Boolean terms: (perinatal AIDS OR perinatal HIV OR vertical HIV transmission) AND (mental health OR mental disorder* OR psychopathology* OR suicide* OR developmental disorder* OR neurodevelopmental disorder* OR neurocognitive disorder* OR psychiatric problem* OR psychiatric illness OR psychiatric disease* OR risk behavio* OR behavio* disorder*) AND (adolesc* OR teen* OR young adult* OR youth OR child). Additionally, the terms "adult*" and "animal*" were used to exclude articles containing these terms in. All articles were then exported to Rayyan, where the selection process was facilitated.

## Article Selection

The search, conducted in February of 2024, yielded a total of 182 articles, 110 from Scopus, 27 from Web of Science, and 45 from PubMed. APA PsycArticles yielded no relevant articles, even after excluding terms related to animals and adults, and so this platform was excluded from the transfer to Rayyan.

Through Rayyan's duplicate detection function, 118 duplicates (and some triplets) were detected; With this, 70 articles were deleted, and the remaining 112 then had their abstracts and titles read and screened. To assist this, terms relevant to the objective of this review were highlighted (e.g., mental health, behavior, young adult, children, adolescent, teenager, PHIV...). This process resulted in the selection of 25 articles for thorough reading after 87 articles were excluded; 34 of the studies were excluded for having the wrong population, 16 didn't have results relevant to this study, 10 had wrong study objectives, 15 were

systematic reviews, 7 were qualitative studies, 4 were unavailable or didn't yet have an outcome, and one wasn't an article. This process is highlighted in Figure 1.

After all the remaining 25 remaining articles were read, two more articles were excluded for not separating PHIV+ from controls in their results, and so a final number of 23 studies were selected for this systematic review. This process is highlighted in Figure 1.

## Quality Assessment

The quality assessment was performed through the National Institutes of Health (NIH) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (National Institute of Health, 2021), to reduce the possibility of bias of this review. The checklist allows the standardized assessment of whether studies were properly structured and realized to increase the validity of this review.

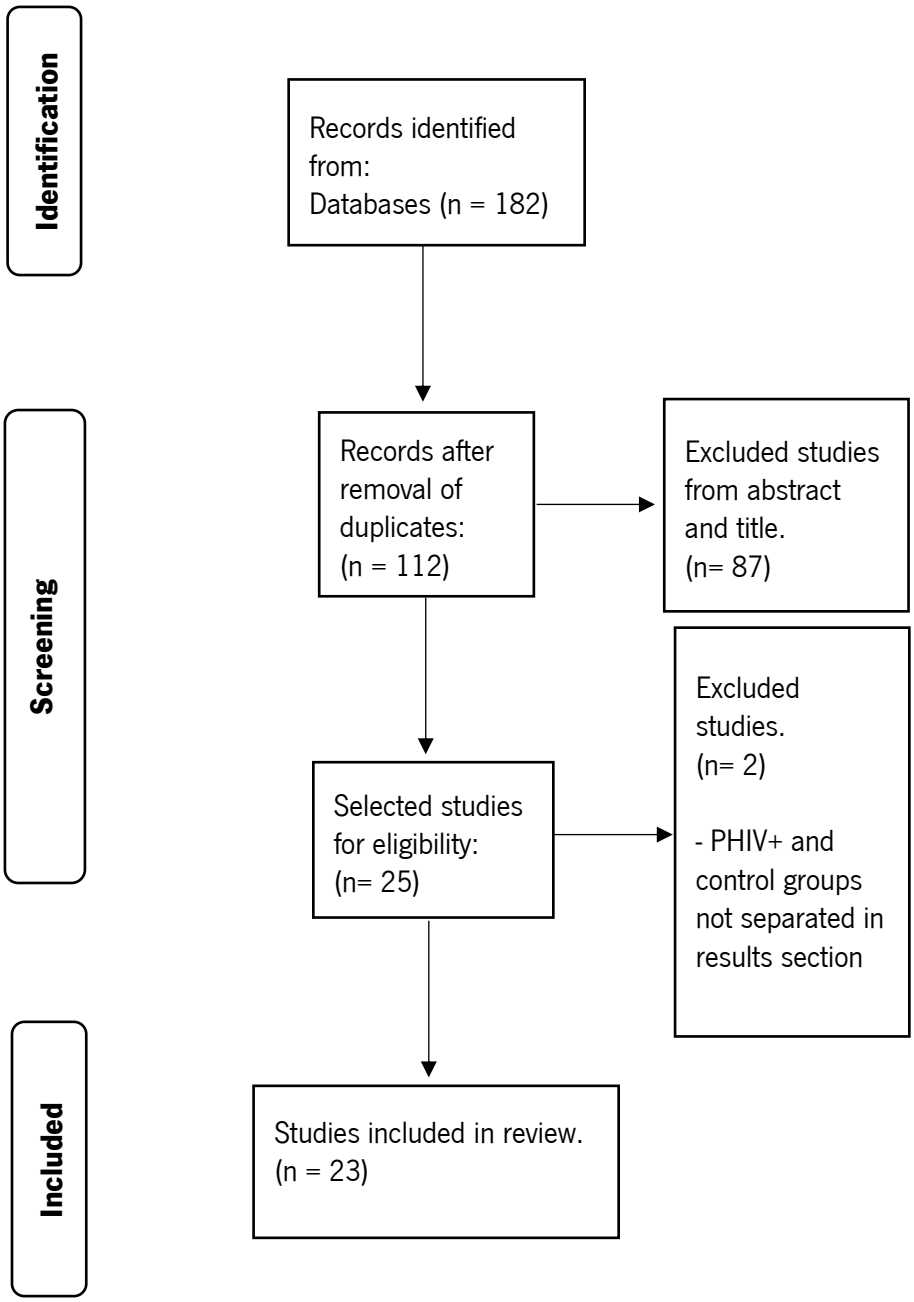
This tool consists of 14 questions that can be answered with yes, no, not determined, not applicable or not reported. To determine the quality of articles, they were rated according to how many questions were answered with yes: 10 to 14 points rate "good", 6 to 9 rate "fair", and 1 to 5 rate "poor" (Freitas, 2021). Due to the tool's applicability to both cross-sectional and longitudinal studies, and some of the questions only applicable to the latter, it is expected some cross-sectional studies will have lower scores when compared to longitudinal studies. Table 1 shows the scores of all articles. Quality scores averaged at 8.6 points out of 14.

## Extraction of Data

After establishing what studies would be included in this review, their relevant data was then extracted for the purposes of obtaining: (a) general information from the studies, such as authors, year, country, study design, number of participants and their ages, what instruments were used; (b) data concerning the prevalence of mental health issues and risk behaviors; (c) differences between PHIV+ and control groups; and (d) any other data relevant to the objective and discussion of this review.

**Figure 1.**

*Diagram of the selection process*.




*Note.* Adapted from Page et al. (2021).

**Table 1.**

*Assessment of the risk of bias*

| Article and quality | Research question | Population specified | Participation rate | Same population | Sample size justified | Exposure assessment | Exposure time | Levels of exposure | Exposure and assessment | Repeated exposure | Measures of results | Blindness of outcome | Follow-up loss | Statistical analysis | Total score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abrams et al., 2018* | Y | Y | Y | Y | N | Y | Y | Y | Y | Y | Y | N.R. | Y | Y | 12 |
| Aurpibul et al., (2021) | Y | Y | Y | Y | N | N | N | Y | Y | N.A. | Y | N.R. | N.A. | Y | 8 |
| Aurpibul et al., (2022) | Y | Y | N.R. | Y | N | N | N | Y | N.R. | N.A. | Y | N.R. | N.A. | Y | 6 |
| Aurpibul et al., (2023a) | Y | Y | N.R. | Y | N | N | N | N | Y | N.A. | Y | N.R. | N.A. | Y | 6 |
| Aurpibul et al., (2023b) | Y | Y | Y | Y | N | N | N | Y | Y | N.A. | Y | N.R. | N.A. | Y | 8 |
| Copelyn et al., (2019)** | Y | Y | N.R. | Y | N | Y | N.R. | Y | Y | N.R. | Y | N.R. | N.R. | Y | 8 |
| Echenique et al., (2017) | Y | Y | N.R. | Y | N | N | N | Y | Y | N.A. | Y | N.R. | N.A. | Y | 7 |
| Elkington et al., (2015)* | Y | Y | Y | Y | N | Y | Y | Y | Y | Y | Y | N.R. | Y | Y | 12 |
| Judd et al., (2018)** | Y | Y | N.R. | Y | N | Y | N.R. | Y | Y | N.R. | Y | N.R. | N.R. | Y | 8 |
| Kang et al., (2011)* | Y | Y | Y | Y | N | N | N | Y | Y | N.A. | Y | N.R. | N.A. | Y | 8 |
| Kidman et al., (2018) | Y | Y | N.R. | Y | N | N | N | Y | Y | N.A. | Y | N.R. | N.A. | Y | 7 |
| Kluisza et al., (2023)* | Y | Y | N.R. | Y | N | Y | Y | Y | Y | Y | Y | N.R. | N.R. | Y | 10 |
| Kreniske et al., (2021)* | Y | Y | N.R. | Y | N | Y | Y | Y | Y | Y | Y | N.R. | N.R. | Y | 10 |
| Louthrenoo et al., (2014) | Y | Y | N.R. | Y | N | N | N | Y | Y | N.A. | Y | N.R. | N.A. | Y | 7 |
| Mellins et al., (2006) | Y | Y | Y | Y | N | N | N | Y | Y | N.A. | Y | N.R. | N.A. | Y | 8 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mellins et al., (2009)* | Y | Y | Y | Y | N | N | N | Y | Y | N.A. | Y | N.R. | N.A. | Y | 8 |
| Mellins et al., (2012)* | Y | Y | Y | Y | N | Y | Y | Y | Y | Y | Y | N.R. | Y | Y | 12 |
| Nguyen et al., (2020)* | Y | Y | N.R. | Y | N | Y | Y | Y | Y | Y | Y | N.R. | N.R. | Y | 10 |
| Perez et al., (2021) | Y | Y | Y | Y | N | Y | Y | Y | Y | Y | Y | N.R. | Y | Y | 12 |
| Sevenoaks et al., (2021) | Y | Y | N.R. | Y | N | N | N | Y | Y | N.A. | Y | N.R. | N.A. | Y | 7 |
| Smith et al., (2019)*** | Y | Y | N.R. | Y | N | Y | Y | Y | Y | Y | Y | N.R. | N.R. | Y | 10 |
| Tassiopoulous et al., (2013)*** | Y | Y | N.R. | Y | N | Y | Y | N | Y | Y | Y | N.R. | N.R. | Y | 9 |
| Williams et al., (2010) | Y | Y | N.R. | Y | N | N | N | N | Y | N | Y | N.R. | N.A. | Y | 6 |

*Note*. Y = Yes; N = No; N.A. = Not applicable; N.R. = Not reported; N.D. = Not determined.

* = CASAH database;

** = AALPHI database;

*** = AMP of the PHACS database.

**Table 2.**

*Extraction of data from selected studies*

| Authors Year | Design | Population size Age | Population Type | Instruments |
|---|---|---|---|---|
| Abrams et al., (2018)* | Longitudinal | *n* = 340 at enrollment - *n* = 248 as of 5th follow-up (FU5); 9-16 at enrollment - 18-28 as of FU5 | PHIV+ and PHEU | Diagnostic Interview Schedule for Children (DISC); Trail Making Test (TMT); Weschler Adult Intelligence Scale (WAIS); Audio Computer-Assisted Self-Interviewing (ACASI); Adolescent Sexual Behavior Assessment (ASBA); Monitoring the Future study; Young Adult milestone. |
| Aurpibul et al., (2021) | Cross-sectional | *n* = 195; 10-24 | PHIV+ | Structured interview about stigma; Child Depression Inventory (CDI); Center for Epidemiologic Studies Depression Scale (CES-D); Child Behavior Checklist (CBCL); Symptom Checklist-90-Revised (SCL-90-R). |
| Aurpibul et al., (2022) | Cross-sectional | *n* = 120; 15-24 | PHIV+ | Questionnaire on lifetime sexual and adolescent behaviors. |
| Aurpibul et al., (2023a) | Cross-sectional | *n* = 111; 15-25 | PHIV+ | World Health Organization Quality of Life-BREF (WHOQOL-BREF); HIV-Adherence Self-Efficacy Scale (HIV-ASES). |
| Aurpibul et al., (2023b) | Cross-sectional | *n* = 355; 18-25 | PHIV+ | Alcohol Use Disorders Identification Test (AUDIT); Drug Abuse Screening Test (DAST); Fagerstrom Test for Nicotine Dependence; Patient Health Questionnaire-Adolescent (PHQ-A); Generalized Anxiety Disorder 7-item Scale (GAD-7); WHO QOL-BREF. |
| Copelyn et al., (2019)** | Longitudinal | *n* = 403; 12-23yrs - 14-25 as of FU | PHIV+ and HIV- | Computer-Assisted Self-Interview (CASI); Hospital Anxiety and Depression Scale (HADS); Rosenberg Self Esteem Scale; Pediatric Quality of Life Inventory (PedsQL 4.0); Minneapolis-Manchester Quality of Life Instrument (MMQL); 21 Item Checklist adapted from the Avon Longitudinal Study of Parents and Children (ALSPAC). |
| Echenique et al., (2017) | Cross-sectional | *n* = 33; 16-29 | PHIV+ and BHIV+ | ACASI; The Fog Zone; Beck Depression Inventory-II (BDI-II); Montreal Cognitive Assessment (MOCA). |

| | | | | |
|---|---|---|---|---|
| Elkington et al., (2015)* | Longitudinal | *n* = 324 at enrollment - *n* = 270 as of FU; 9-16 at enrollment - 13-24 as of FU2 | PHIV+ and PHEU | DISC and Adolescent Sexual Behavior Assessment (ASBA). |
| Judd et al., (2018)** | Longitudinal | *n* = 392; 12-23yrs - 14-25 as of FU | PHIV+ and HIV- | CASI; AUDIT; PedsQL 4.0; HADS; Rosenberg Self Esteem Scale; Income Deprivation Affecting Children Index (IDACI). |
| Kang et al., (2011)* | Cross-sectional | *n* = 325; 9-16 | PHIV+ and PHEU | CDI; State-Trait Anxiety Inventory for Children (STAI-C); Life Event Checklist (LEC); Systems of Belief Inventory (SBI); Social Problem Solving Inventory (SPSI). |
| Kidman et al., (2018) | Cross-sectional | *n* = 250; 13-24 | PHIV+ | Adverse Childhood Experiences International Questionnaire (ACE-IQ); BDI; CRAFFT Screening Questionnaire; Questions about sexual behavior. |
| Kluisza et al., (2023)* | Longitudinal | *n* = 340 at enrollment - *n* = 223 as of FU6; 9-16 at enrollment - 18-29 as of FU6 | PHIV+ and PHEU | ACASI and DISC-IV. |
| Kreniske et al., (2021)* | Longitudinal | *n* = 339 at enrollment - *n* = 206 as of FU7; 9-16 at enrollment - 24.6 average as of FU7 | PHIV+ and PHEU | DISC-IV; CDI; LEC; City Stress Inventory (CSI); SBI; Tennessee Self Concept Scale (TSCS); Social Problem-Solving Inventory for Adolescents (SPSI-A); Social Impact Scale (SIS). |
| Louthrenoo et al., (2014) | Cross-sectional | *n* = 106; 11-18 | PHIV+ and HIV- | Youth Self-Report (YSR) and CBCL. |
| Mellins et al., (2006) | Cross-sectional | *n* = 47; 9-16 | PHIV+ | DISC-IV; CBCL; CDI; BDI; The State-Trait Anxiety Inventory (STAI); Clinical Diagnostic Questionnaire (CDQ). |
| Mellins et al., (2009)* | Cross-sectional | *n* = 340; 9-16 | PHIV+ and PHEU | DISC and caregiver report about the child's experience of symptoms. |
| Mellins et al., (2012)* | Longitudinal | *n* = 340 at enrollment - *n* = 280 as of FU1; 9-16 at enrollment - 18.5 months older as of FU1 | PHIV+ and PHEU | DISC and caregiver report about the child's experience of symptoms. |

| | | | | |
|---|---|---|---|---|
| Nguyen et al., (2020)* | Longitudinal | *n* = 340 at enrollment - *n* = 249 as of FU5; 9-16 – 18-29 as of FU5 | PHIV+ and PHEU | CSI; BDI; STAI; CDQ; DISC. |
| Perez et al., (2022) | Longitudinal | *n* = 515 at enrollment; 9-14 at enrollment | PHIV+ | 10-item stigma questionnaire; Strengths and Difficulties Questionnaire (SDQ); 17-item patient-provider relationship scale. |
| Sevenoaks et al., (2021) | Cross-sectional | *n* = 158; 12-15 | PHIV+ and HIV- | Childhood Trauma Questionnaire Short Form (CTQ-SF); Life Events Questionnaire (LEQ); HIV Stigma Scale for South African Adolescents Living with HIV; Beck Youth Inventory (BYI); CBCL; Columbia Impairment Scale (CIS); Children's Motivation Scale (CMS); Conners Scale for ADHD; Self-reporting for alcohol use; Toxicology for illicit substances. |
| Smith et al., (2019)*** | Longitudinal | *n* = 558; 10-22 | PHIV+ and PHEU | Neuropsychological Diagnoses (NPD) interview; Behavior Assessment System for Children-Second Edition (BASC-2); Quality of Life Assessment for Children; Client Diagnostic Questionnaire (CDQ). |
| Tassiopoulous et al., (2013)*** | Longitudinal | *n* = 377; 10-18 | PHIV+ | ACASI; BASC-2; ASBA; Parent-Child Relationship Inventory (PCRI). |
| Williams et al., (2010) | Cross-sectional | *n* = 299; 12-18 | PHIV+; PHEU and HIV- living with HIV+ | Youth Inventory-4 (YI-4); Child and Adolescent Symptom Inventory-4R (CASI-4R); Assessments of substance abuse through instrument. |

*Note.* * = CASAH database;
** = AALPHI database;
*** = AMP of the PHACS database.

# Results

## Studies Characterization

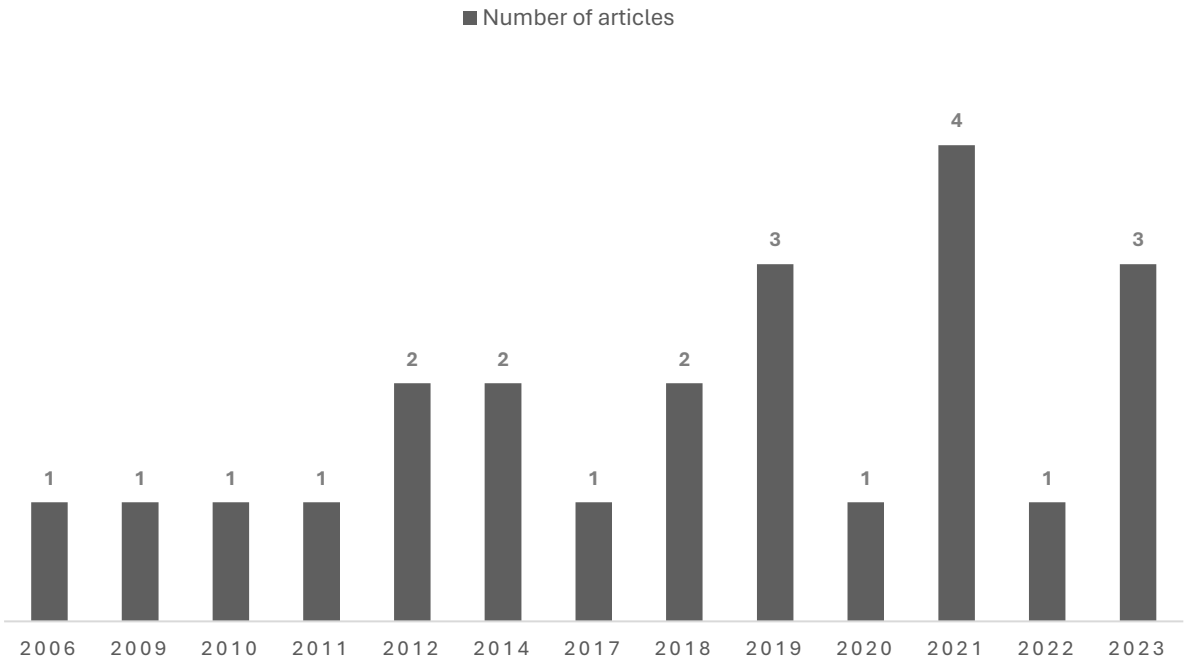
This systematic review included 23 studies published between 2006 and 2023 (Figure 2), conducted in different countries (Figure 3), mostly in the USA (57%), Thailand (17%), Cambodia and Thailand (4%), South Africa (13%), and England (9%). Related to the methodologic approach, 52% ($n$ = 12) were cross-sectional, while 48% ($n$ = 11) were longitudinal. Some of the studies had their data obtained from the same databases: 8 (35%) studies had data from the Child and Adolescent Self-Awareness and Health (CASAH) study database, two from the Adolescents and Adults Living with Perinatal HIV (AALPHI) study database, and two from the Adolescent Master Protocol (AMP) of the Pediatric HIV/AIDS Cohort Study (PHACS) database. One study was from IMPAACT database, one for RESILIENCE database, and another from CTAAC database. The other 11 (48%) studies performed with their own methodologies and applications. 8 (35%) of the studies had only PHIV+ in population, 10 (43%) had results for both PHEU and PHIV, one had PHIV, PHEU and HIV- living with someone with HIV. 4 had healthy controls as well as PHIV and one had PHIV and BHIV.

About 70% ($n$ = 16) of the studies had data analyzing psychiatric comorbidities of PHIV individuals (Mood disorder, ADHD, anxiety, and trauma), while 61% ($n$ = 14) had data for risk behaviors (Unprotected sex, substance abuse, suicide/self-harm). Some of the studies collected data on different dimensions of these individuals' lives that can yield relevant data to the objectives of this study, such as the effects of neighborhood stress, stigma, and assessments of quality of life. Half of the studies ($n$ = 12) also had data on PHEU, BHIV+ and healthy controls' mental health and risk behaviors, which can provide comparisons that may better inform the reality of PHIV's conditions. Data on differences between men and women, as well as age differences between adolescents and young adults were extracted for analysis, as they might prove to have relevance on the condition's effects.

The demographics of the populations in this reviews' studies were generally comparable 74% ($n$ = 17) of the studies had overall participants from low-income households and disadvantaged communities. Aside from Echenique (2017) that had an all-female population, all studies had balanced genders percentages. When compared to controls, all studies had a higher proportion of PHIV+. Many studies reported that less than half of PHIV+ lived with their biological parents, in contrast with control groups.

**Figure 2.**

*Number of articles per year*




## Studies' Synthesis

As was previously established, over half of the studies in this review have data from databases, and because of this, different studies were found to share the same population. To prevent any bias to the analysis of this review's results, each database's studies were synthesized separately before integrating them into the overall synthesis. This ensures that the results aren't skewed towards any particular population. Surprisingly, due to many of these being longitudinal studies and having many different instruments, different results were obtained from studies containing the same population.

## Mental Health

Through instruments like the DISC and CBCL, that provide broad assessments to psychiatric comorbidities, 8 out of 9 (89%) studies found high prevalences, from 18% to 69%, of PHIV+ with any psychiatric problem (Abrams et al., 2018; Aurpibul et al., 2021; Aurpibul et al., 2023a; Mellins et al., 2006; Mellins et al., 2009; Mellins et al., 2012; Nguyen et al., 2020; Smith et al., 2019). Eight of 10 articles found

no differences between PHIV+ and control groups results, indicating HIV was not an indicator of psychiatric comorbidity (Abrams et al., 2018; Aurpibul et al., 2021; Copelyn et al., 2019; Kluisza et al., 2023; Mellins et al., 2012; Nguyen et al., 2020; Sevenoaks et al., 2021; Smith et al., 2019).

The two articles that found significant differences between HIV statuses found that PHIV+ are more negatively affected and exhibit more psychiatric problems (Louthrenoo et al., 2014; Mellins et al., 2009). Mellins (2009) found PHIV+ to be significantly more affected than control groups, which is curious considering its data comes from the same database (CASAH) as four other studies that found no difference. This inconsistency may be due to it being, of the five, the only cross-sectional study, and therefore presenting data from a particular point in time that provided different results from its peer studies. This is consistent with other longitudinal studies that found differences between baseline and follow-up results and would suggest age being a factor affecting the mental health of this population.

Relative to other mental health disorders, mood disorder was found at lower prevalences overall, with prevalences ranging between 3% and 36% (16% average) in 10 studies (Abrams et al., 2018; Aurpibul et al., 2021; Aurpibul et al., 2023b; Kidman et al., 2018; Kreniske et al., 2021; Mellins et al., 2006; Mellins et al., 2009; Mellins et al., 2012; Nguyen et al., 2020; Smith et al., 2019), while anxiety was commonly found to be the most prevalent disorder, ranging from 4% to 49% (29% average) in 7 studies (Abrams et al., 2018; Aurpibul et al., 2023b; Kreniske et al., 2021; Mellins et al., 2006; Mellins et al., 2009; Mellins et al., 2012; Smith et al., 2019).

All comparisons between PHIV+ and controls for anxiety found no differences between them (Abrams et al., 2018; Copelyn et al., 2019; Judd et al., 2018; Kang et al., 2011; Mellins et al., 2009; Mellins et al., 2012; Nguyen et al., 2020; Sevenoaks et al., 2021; Williams et al., 2010), while 8 out of 9 studies comparing mood disorders also found no differences (Abrams et al., 2018; Copelyn et al., 2019; Judd et al., 2018; Kang et al., 2011; Mellins et al., 2009; Nguyen et al., 2020; Sevenoaks et al., 2021; Williams et al., 2010). Only one study found PHIV+ to have less prevalences of mood disorder compared to BHIV+ (Echenique et al., 2017).

The three studies that sought HIV statuses difference for ADHD scores all found differing results. Two of these, both from the CASAH database, found opposite results, Mellins (2009) finding PHIV+ were more affected by ADHD, while Abrams (2018) established the contrary. As previously stated, Mellins (2009) study obtained different overall results compared to other CASAH database articles, so its expected the same

reasoning also applies to this inconsistency. Overall, ADHD prevalences averaged from 1% to 21% of PHIV+ (Abrams, et al., 2018; Mellins et al., 2006; Mellins et al., 2009; Mellins et al., 2012; Smith et al., 2019).

Two studies assessed trauma disorders, and both found low levels of PHIV+ with PTSD (Abrams et al., 2018; Smith et al., 2019), though assessments to childhood adverse experiences and trauma found that 52% of PHIV+ experienced more than 7 ACESs (Kidman et al., 2018). Status comparisons found no differences between groups concerning traumatic experiences. Despite emotional neglect and physical abuse being found to be prevalent, a low prevalence of high trauma was reported. A reasoning for this could be that they were most likely under-reporting their experience (Kidman et al., 2018; Sevenoaks et al., 2021).

## Risk Behaviors

The prevalence of sexual risk taking was found at differing rates, with two articles reporting low values (Abrams et al., 2018; Aurpibul et al., 2022), and others ranging from 19% to 62% (Judd et al., 2018; Kluisza et al., 2023; Tassiopoulous et al., 2013). Five articles compared the sexual activity of PHIV+ and controls, and while three found no difference between (Abrams et al., 2018; Echenique et al., 2017; Elkington et al., 2015), two reported PHIV+ engaged less frequently in sexual risk practices (Judd et al., 2018; Kluisza et al., 2023). Once again, there was an inconsistency in CASAH data, with Kluisza (2023) disagreeing with Abrams (2018) and Elkington (2015) findings. Due to its relative, recency, it has data from the latest follow-up, which could explain this discrepancy.

Rates of substance use disorder also differed between articles, ranging from 4% to 34% (Abrams et al., 2018; Kidman et al., 2018; Mellins et al., 2009; Mellins et al., 2012; Nguyen et al., 2020; Sevenoaks et al., 2021; Williams et al., 2010), with alcohol overwhelmingly being the most common substance (Abrams et al., 2018; Elkington et al., 2015; Aurpibul et al., 2022; Kidman et al., 2018; Sevenoaks et al., 2021) reported by PHIV+. The CASAH database studies reported no association between consumption and being afflicted with the condition (Abrams et al., 2018; Elkington et al., 2015; Mellins et al., 2012; Nguyen et al., 2020), differing from Williams (2010) that found controls tended to consume more, and Sevenoaks (2021), which found PHIV+ to consume more.

Suicide or self-harm were not as commonly evaluated, though rates were high, ranging from 10 to 27% (Aurpibul et al., 2022; Aurpibul et al., 2023b; Copelyn et al., 2019; Kreniske et al., 2021), with comparisons between PHIV+ and controls finding both that there were no differences between groups

(Copelyn et al., 2019), and that PHIV+ had 2 times the odds of making a suicide attempt over the course of the longitudinal study (Kreniske et al., 2018).

### Stigma, Quality of Life, Relationship with Caregivers

An evaluation of perceived stigma yielded varied outcomes. One article indicated that 25% of participants had reported lifetime experience of stigma and adverse treatment due to their status (Aurpibul et al., 2021), while two others reported low to no stigma (Perez et al., 2022; Sevenoaks et al., 2021). No correlation between stigma and depression was found for adolescents (Aurpibul et al., 2021), while for adults it was associated with depression, anger, and disruptive behavior (Sevenoaks et al., 2021).

Quality of life assessments mostly found PHIV+ to have "good" or "nor good nor bad" scores, with very few reporting poor quality of life (Aurpibul et al., 2023b; Aurpibul et al., 2023a). Despite this, all comparisons between groups found PHIV+ to have poorer quality of life (Copelyn et al., 2019; Judd et al., 2018; Louthrenoo et al., 2014). Many also reported being neither satisfied or dissatisfied with their lives, feeling that the discomfort prevented them from doing what they needed to do (Aurpibul et al., 2023a).

Caregiver mental health was associated with the health outcomes of youths living with perinatal HIV (PHIV+), both positively and negatively. On the positive side, it can facilitate overcoming mental health challenges and engaging in care (Aurpibul et al., 2021). On the negative side, PHIV+ youths living with biological caregivers, who also carry the burdens of the condition, have been found to have poorer quality of life scores compared to those living with non-parent caregivers (Aurpibul et al., 2023a). Despite these findings, another study suggests that youths living with biological parents are less likely to be diagnosed with ADHD (Mellins et al., 2019), indicating an inconsistency in the effects of living with a biological caregiver on PHIV+ youth.

### Gender and Age Comparisons

Overall, few differences could be attributed to gender. Gender comparisons found that girls were more likely to present with any psychiatric disorder and anxiety disorders (Kluisza et al., 2023; Mellins et al., 2012), while boys were more likely to have behavioral disorders (Mellins et al., 2012; Smith et al., 2019). Despite this, Perez et al. (2022) found boys had lower scores in hyperactivity and conduct subscales when compared to girls. Young adult females were found to have higher self-efficacy (Aurpibul et al., 2021a), while

males had higher odds sexual initiation (Judd et al., 2018), even though no significant differences in sexual risk-taking behaviors between genders were observed (Copelyn et al., 2019; Judd et al., 2018). Worryingly, Copelyn et al. (2019) found girls had five times the odds of attempting self-harm. No differences

Age comparisons found mood and behavioral disorders were more likely in older youths, while anxiety disorders were more prevalent in younger youth (Kang et al., 2011; Mellins et al., 2012; Mellins et al., 2019). In contrast, Smith et al. (2019) found that both younger and older individuals had similar prevalence rates of mental disorders, that behavior disorders were more common among adolescents compared to older age groups and found anxiety disorders to be marginally more prevalent among young adults.

Higher age was found to increase the odds of starting in behaviors such as substance use (Williams et al., 2010) and sexual activity (Aurpibul et al., 2022; Judd et al., 2018; Perez et al., 2022), and Kreniske et al. (2021) associated older age with increased odds of suicide attempts.

**Table 3.**

*Percentages and comparisons between HIV statuses*

| Author | Psychiatric functioning | | Mood disorder | | Anxiety | | ADHD | | Trauma disorders | | Sexual risk taking | | Substance use disorder | | Suicide/Self-harm | | Stigma | | Poor quality of life | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % | S | % | S | % | S | % | S | % | S | % | S | % | S | % | S | % | S | % | S |
| Abrams et al., 2018* | 26 | = | 11 | = | 22 | = | 1 | + | 5 | n.i. | - | = | 25 | = | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Aurpibul et al., 2021 | 18 | = | 20 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | 25 | n.i. | n.i. | n.i. |
| Aurpibul et al., 2022 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | - | n.i. | + | n.i. | 11 | n.i. | n.i. | n.i. | n.i. | n.i. |
| Aurpibul et al., 2023a | n.i. | n.i. | 36 | n.i. | 19 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | + | n.i. | 10 | n.i. | n.i. | n.i. | 1 | n.i. |
| Aurpibul et al., 2023b | + | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | - | n.i. |
| Copelyn et al., 2019** | - | = | - | = | - | = | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | 12 | = | n.i. | n.i. | n.i. | - |
| Echenique et al., 2017 | n.i. | n.i. | + | + | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | + | = | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Elkington et al., 2015* | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | = | + | = | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Judd et al., 2018** | n.i. | n.i. | n.i. | = | n.i. | = | n.i. | n.i. | n.i. | n.i. | 32 | + | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | - |
| Kang et al., 2011* | n.i. | n.i. | n.i. | = | n.i. | = | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Kidman et al., 2018 | n.i. | n.i. | 34 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | + | n.i. | 18 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Kluisza et al., 2023* | n.i. | = | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | 19 | + | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Kreniske et al., 2021* | n.i. | n.i. | 3 | n.i. | 31 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | 27 | - | n.i. | n.i. | n.i. | n.i. |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Louthrenoo et al., 2014 | n.i. | - | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | - |
| Mellins et al., 2006 | 55 | n.i. | 13 | n.i. | 40 | n.i. | 21 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Mellins et al., 2009* | + | - | 7 | = | 49 | = | 18 | - | n.i. | n.i. | n.i. | n.i. | 4 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Mellins et al., 2012* | 69 | = | 10 | n.i. | 30 | = | 16 | n.i. | n.i. | n.i. | n.i. | n.i. | 4 | = | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Nguyen et al., 2020* | 43 | = | 11 | = | + | = | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | 27 | = | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Perez et al., 2022 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | - | n.i. | n.i. | n.i. |
| Sevenoaks et al., 2021 | n.i. | = | n.i. | = | n.i. | = | n.i. | n.i. | n.i. | = | n.i. | n.i. | 34 | - | n.i. | n.i. | - | n.i. | n.i. | n.i. |
| Smith et al., 2019*** | 30 | = | 11 | n.i. | 4 | n.i. | 20 | n.i. | 2 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Tassiopoulos et al., 2013*** | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | 62 | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |
| Williams et al., 2010 | n.i. | n.i. | n.i. | = | n.i. | = | n.i. | = | n.i. | n.i. | n.i. | n.i. | 13 | + | n.i. | n.i. | n.i. | n.i. | n.i. | n.i. |

*Note*. % = Prevalence ("+" if over 10% prevalence or described in text as "high"; "-" if below 10% or described in text as "low"); S = Status ("+" if PHIV+ better relative to control group; "=" if no difference between PHIV+ and controls; "-" if PHIV+ worse relative to control group; n.i. = No information.

* = CASAH database;

** = AALPHI database;

*** = AMP of the PHACS database.

## Discussion

The main objective of this systematic review was to establish the state of the literature on the mental health and risk behaviors of PHIV+ adolescents and young adults. This specific population, characterized by unique medical and psychosocial challenges, was expected to exhibit poor mental health scores, as well as a myriad of risk behaviors, especially when compared to uninfected or behaviorally infected peers, due to their lifelong condition and its many hurdles. Surprisingly, despite showing high prevalences of these problems, they weren't much different from control groups of uninfected peers.

Results show a significant relation between mental health issues and risk behaviors among PHIV+ individuals. Associations between substance use disorders, sexual risk-taking, and self-harm with mood disorders and anxiety were evident across the studies reviewed. Substance use, particularly alcohol, was a common coping mechanism, often exacerbating other risk behaviors and mental health issues (Aurpibul et al., 2023b). Sexual risk-taking behaviors were prevalent and appeared to correlate with substance use and adverse childhood experiences (Kidman et al., 2018). These interconnections suggest a cycle where poor mental health can lead to risky behaviors, further compromising both mental and physical health.

High rates of psychiatric disorders such as anxiety and mood disorders were frequently reported among PHIV+, with anxiety being the most prevalent disorder. The pervasive anxiety could be attributed to the constant awareness of living with a chronic illness and the uncertainty about future health outcomes (Louthrenoo et al., 2014). Comparatively, mood disorders were less prevalent. While ADHD was prevalent among PHIV+, it can't concretely be associated to the condition, as status comparisons differed entirely.

Quality of life assessments consistently indicated poorer outcomes for PHIV+ individuals compared to controls. The persistent discomfort and limitations imposed by their condition likely contribute to these findings (Aurpibul et al., 2023a). Furthermore, studies analyzing the influence of environmental factors, such as neighborhood stress, found a strong association between high-stress environments and increased anxiety levels among PHIV+ youth (Kidman et al., 2018). There was a surprising lack of mentions and high values of stigma and trauma reported in this review's articles. This could be due to PHIV+ downplaying their effects when reporting, as they've been found likely to do so (Sevenoaks et al., 2021).

As expected, for PHIV+, biological caregivers seem to be associated with a lower quality of life. Necessarily, they have a parent afflicted by the condition and therefore might suffer from the same problems

and challenges, making it more difficult to raise another person, or might be dealing with the loss of said relative (Aurpibul et al., 2023a).

Age comparisons were not focused upon by the articles in this review, and data seemed to mostly disagree. Despite this, older age groups were found to engage more regularly in sexual risk-taking and substance use disorder (Kidman et al., 2018). This trend is expected, as such behaviors are more common in the general population and are often consequences of lifestyle choices more frequently experienced by older individuals. This is worrying, as substance use, particularly alcohol, leads to various dimensions of mental health issues and risk behaviors, including self-harm and sexual risk-taking (Williams et al., 2010; Aurpibul et al., 2022; Judd et al., 2018; Perez et al., 2022).

Gender differences were noted, with some studies reporting higher rates of anxiety and suicide tendencies among females, though no significant differences in sexual risk-taking behaviors between genders were observed (Copelyn et al., 2019; Judd et al., 2018). These gender-specific findings highlight the need for tailored interventions to address the unique needs of male and female PHIV+ individuals.

Comparing the mental health and risk behaviors of PHIV+ and their HIV-negative counterparts, numerous studies revealed few significant differences based on HIV status. The CASAH database found no significant HIV status differences in psychiatric disorder rates, sexual behaviors, substance use, educational achievement, or employment status. Sixty-seven percent of young adults had graduated high school or obtained a general equivalency diploma, with 19% attending college. Less than half were working, but 62% were either working or in school. Furthermore, 12% reported ever being incarcerated, and 16% had ever been homeless, with no differences based on HIV status (Abrams et al., 2018; Elkington et al., 2015; Kluisza et al., 2023; Mellins et al., 2012)

Similarly, Smith et al. (2019) study found no difference in the prevalence of mental health comorbidities based on HIV status, and Judd et al. (2018) and Copelyn et al. (2019) found no differences in anxiety, depression, self-esteem scores, or self-harm. Williams et al. (2010) observed no association between HIV status and reported substance use, with a moderate within-family correlation in substance use suggesting that HIV status does not significantly influence these behaviors. Sevenoaks' study found no differences between HIV statuses except for higher alcohol consumption among PHIV+ youth. These findings collectively indicate that despite the anticipated challenges faced by PHIV individuals, their mental health and risk behaviors are often comparable to their HIV-negative peers.

These findings were unexpected given the numerous challenges faced by PHIV+ individuals, such as living with a chronic illness, facing social stigma, and dealing with the loss of family members due to AIDS (Louthrenoo et al., 2014). One possible explanation for this discrepancy is the heightened level of healthcare and psychosocial support that PHIV+ individuals receive. Regular medical follow-ups, counseling, and support groups might contribute to a level of resilience that buffers against some of the adverse outcomes typically expected in this population (Abrams et al., 2018; Copelyn et al., 2019).

Most PHIV+ youth have been engaged in programs, interacting with providers which may in turn result in better identification and treatment of mental health needs, greater support, and counterbalance any additional vulnerability that might be present because of HIV, difficulties of coping with a chronic, stigmatized illness or the presence of environmental risks (Malee et al., 2011; Mellins et al., 2012).

Studies suggest that PHIV– youth or unexposed, uninfected youth with HIV+ caregivers are equally if not more vulnerable to mental health problems than PHIV+ youth, as PHIV– youth generally do not have access to similar comprehensive services. They typically receive preventive care annually and additional care on an emergent basis, without the consistent support and specialized services available to PHIV+ youth, which heightens their vulnerability to mental health or behavioral problems (Mellins et al., 2012).

It has been found that whether HIV infected or not, HIV exposed children often share risks, such as family histories of substance abuse and psychiatric disorders, loss of family and friendships, discrimination, poverty, inadequate housing, and exposure to violence, all of which have been associated with increased mental health disorders (Malee et al., 2011).

Environmental and demographic factors must be carefully considered. Many PHIV+ individuals come from socioeconomically disadvantaged backgrounds, characterized by high levels of neighborhood violence, low socioeconomic status, and racial discrimination. These contextual factors can significantly impact mental health and risk behaviors, often complicating the isolation of the effects solely attributable to HIV status (Koenig et al., 2011). It is plausible that the shared environmental stresses between PHIV+ individuals and their peers from similar backgrounds might mask differences that would otherwise be more apparent. Almost all studies populations were from poor sociodemographic backgrounds, as were their control groups. This can explain the comparisons between PHIV+ and the uninfected peers not having differing results. The context seems to matter more than the condition itself.

This review was not without limitations. The predominance of studies using data from a few large databases may introduce bias and limit the generalizability of findings. Quality assessment of the studies

found that some of them relatively underperformed, which vary this reviews' scientific merit. Additionally, methodological differences, such as varying instruments and time frames, complicate direct comparisons across studies. The lack of uniformity in reporting and study design further hinders analysis in this review.

## Conclusions

Overall, this review underscores the complex and multifaceted nature of mental health and risk behaviors in PHIV+ adolescents and young adults. While evidence suggests that PHIV+ individuals are at high risk for mental health disorders and engaging in risky behaviors, their outcomes are not markedly worse than those of their uninfected peers from similar backgrounds. This resilience may be attributed to frequent healthcare interactions and targeted support. Nonetheless, the unique challenges faced by PHIV+ individuals, particularly concerning quality of life and environmental stressors, warrant further research and tailored interventions to support this vulnerable population effectively.

Considering complex connections between mental health and risk behaviors, and sometimes contradictory findings of the studies reviewed, it becomes clear that more focused and methodologically consistent research is needed to understand fully the mental health and behavioral challenges faced by PHIV+ individuals. Future research should aim to clarify the impacts of demographic and environmental factors, explore gender-specific issues in more depth, and develop targeted interventions to enhance the quality of life for PHIV+ adolescents and young adults. Addressing these gaps will be crucial in providing comprehensive care and support for this unique population, ultimately improving their long-term health and well-being.

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