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Ambivalent experiences of people in treatment for tuberculosis-HIV coinfection: a meta-synthesis of qualitative studies

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Abstract *This study examined the scientific literature, by means of a systematic review with meta-synthesis (PROSPERO No. CRD42023410141), to discover the experiences of people undergoing treatment for tuberculosis-HIV coinfection. Ten databases and reference lists were searched for original articles with qualitative data, published in Portuguese, English and/or Spanish up to 2022. The 11 studies included yielded a meta-theme comprising four themes: (i) tuberculosis-HIV coinfection diagnosis and treatment have impact on the life of the affected person; (ii) personal, social and economic vulnerabilities overlap in people with tuberculosis-HIV coinfection; (iii) medication burden and programmatic weaknesses hinder the treatment of tuberculosis-HIV coinfection; and (iv) support networks and care flows facilitate treatment of tuberculosis-HIV coinfection. Due to the diagnosis, people with tuberculosis-HIV coinfection raise biopsychosocial needs which, associated with weaknesses in health services and practitioners, adversely affect their quality of life and treatment adherence. However, social, family and health care support were revealed to be important to stimulating (self-)care and providing appropriate treatment.*
Key words *HIV, Tuberculosis, Coinfection, Systematic review, Qualitative research*

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Introduction

Tuberculosis (TB) and human immunodeficiency virus (HIV) have persisted as challenging infections with impact on health systems, especially from the interaction between progression of the two infections[1-3]. Persons with HIV are around 20 times more likely to contract TB than those without the virus[1,2]. Also, persons with HIV commonly display unsuccessful TB treatment outcomes, including death, failure and loss to follow-up[4-6].

A global collaborative movement is underway to end the TB and HIV epidemics by 2030, as stated in the third goal of the United Nations (UN) Sustainable Development Goals (SDGs)[7]. In that connection, substantial progress has undeniably been made in early detection by means of concomitant testing for the infections and early treatment, as antiretroviral therapy (ART) has become available for use in combination with the TB therapy regimen[1,3,8].

In Brazil, between 2010 and 2021, 122,211 new cases of TB-HIV coinfection were reported in the population from 18 to 59 years of age; incidence trended downward by -4.3% per year in that period (95% confidence interval [95%CI] -5.1 to -3.7)[9]. Nonetheless, these infections occurring concomitantly affect Brazil disproportionately nationwide, because of the existence of high-occurrence clusters, particularly in larger urban municipalities, such as state capitals, and in areas where HIV prevalence and/or TB incidence are high[10].

Note that people suffering from TB-HIV coinfection face economic, socio-cultural and behavioural barriers to effective treatment, particularly in countries with limited resources for controlling and combating these infections[11,12]. These obstacles result from factors relating to low levels of literacy, increasing poverty, gender inequalities, food insecurity or malnutrition, infection-related social stigmas, and poor access to and bonding with health care services[11].

It must be stressed that treatment for TB-HIV coinfection entails adhering to both therapies: to HIV therapy, which is uninterrupted, and to TB therapy, which lasts at least six months in typical cases[13]. Although treatment for HIV and TB is complex, adherence is a prime determinant of successful TB-HIV coinfection outcomes and minimises the emergence of drug resistance, relapse and/or progression of the infections, and even death associated with these conditions[14].

Person-centred care has played a prominent role in TB treatment[15]. It has been pointed out that, in understanding the factors in play in this follow-up – as addressed by quantitative studies[4-6] – it is particularly important to bear in mind that, although the biological effects are similar, the experience of treatment is individual and, accordingly, should be supported by specific strategies[16,17]. In that light, a compilation of the qualitative literature may be useful in enabling care to contemplate these singularities[16].

As a preliminary to the study and as recommended[18], a search for systematic reviews was conducted in the following databases: Joanna Briggs Institute (JBI) Evidence Synthesis, Medical Literature Analysis and Retrieval System Online, Cochrane, Database of Abstracts of Reviews of Effects and International Prospective Register of Systematic Reviews (PROSPERO), using the strategy: ("systematic review") AND (tuberculosis OR coinfection OR "AIDS-related opportunistic infections") AND (HIV OR "acquired immunodeficiency syndrome").

The 2,324 publications retrieved in February 2023 were examined and, as none was a review with meta-synthesis, it was realised that to map and compile the qualitative evidence would be unprecedented. Accordingly, the aim here was to review the scientific literature to learn the experience of persons undergoing treatment for TB-HIV coinfection, given that understanding that phenomenon would assist in formulating and/or re-formulating specific, individual health care plans to foster better quality of life for this population.

Methods

Study design

This systematic review with meta-synthesis was designed to assemble qualitative discoveries and to produce recommendations to guide public policymaking. This study was conducted to JBI criteria and reported as recommended by the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) checklist[18,19]. The protocol was registered with PROSPERO (CRD42023410141) and the dataset with supplementary material was deposited in Mendeley Data[20].

Systematic reviews seek to provide a comprehensive, impartial synthesis of important studies, using rigorous, transparent search and selection methods, then to map and compile knowledge by way of the following stages[18]: (i) formulating the research question; (ii) specify-

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ing inclusion and exclusion criteria; (iii) locating studies; (iv) selecting studies; (v) appraising the studies' quality; (vi) extracting data; (vii) analysing and synthesising studies; and (viii) presenting and interpreting the results.

Formulating the research question

The research question was structured by employing the mnemonic PICo: population (P), phenomenon of interest (I) and context (Co)[18]. In this case, P was specified as the adult population (persons aged 18 or more years old); I as experiences in the course of treatment for TB; and Co as the singularity of living with HIV. In that way, the question guiding the searches for the review was: what are the experiences of adult persons living with HIV in treatment for coinfection with TB?

Specification of inclusion and exclusion criteria

The search considered original particles with qualitative data published in Portuguese, English and/or Spanish (in which the authors are fluent) at any time prior to 2023 (as that was the year in which the review began). The search excluded repeat studies, studies not available in full and/or free of charge and those whose findings were partial and/or not relevant to the guiding question, including those centring on a health practitioners' perspective or on TB-prevention therapy among persons with HIV.

Locating and selecting studies

First, Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH) equivalents were identified and searches were conducted of the Virtual Health Library (VHL) and PubMed Central (PMC). Here, the terms used were: HIV, *infecções oportunistas relacionadas com a aids* (AIDS-related opportunistic infections), *síndrome de imunodeficiência adquirida* (acquired immunodeficiency syndrome), *tuberculose* (tuberculosis), *coinfecção* (coinfection) and *pesquisa qualitativa* (qualitative research).

Studies were located from a list of ten databases, which made it possible to construct specific search strategies and use filters to optimise the selection process (Chart 1). Associations were established between the descriptors using the Boolean operators "AND" and "OR", while the "approach type" descriptor was used only on databases where the initial search without it resulted in a vast number of publications. In addition to the timeframe of publications up to 2022, the search was refined using "original article".

The search was conducted between April and August 2023 by two doctoral students (LV Lima and G Pavinati), working independently with the assistance of Rayyan, to assure a trustworthy selection. In order to assure a more inclusive article retrieval process, the databases were consulted using the *Comunidade Acadêmica Federada* access, provided on the *Portal de Periódicos* of the *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*/Ministry of Education (CAPES/MEC).

The studies were selected in two stages, as illustrated below in a flow diagram[19]. The first stage involved examining the titles and abstracts and preselecting potentially eligible studies, which were then evaluated by reading in full. The reference lists of articles selected for reading in full were also examined (reverse search), following the same stages. At that point, divergences between the reviewers on four included articles were resolved in consensus with the other researchers (Supplementary Material 1, available at: https://data.mendeley.com/datasets/gfvc6kgjp6/4)[20].

Appraising the quality of the studies

The potentially eligible studies underwent a process of evaluation guided by the JBI Critical Appraisal Checklist for Qualitative Research[18]. This comprises ten items to guide critical appraisal of evidence quality and credibility. Assessment on each criterion is expressed by the alternatives: "yes", "no", "uncertain" and "not applicable". The articles were evaluated on the basis of 70% consistency (i.e., at least seven items assessed as "yes") as the inclusion parameter (Supplementary Material 2, available at: https://data.mendeley.com/datasets/gfvc6kgjp6/4)[20].

Data extraction, analysis and synthesis

The data items extracted were: authors, title, year and journal of publication, theoretical and methodological frame of reference (as adopted and described by the study's authors), participants, context, data collection and analysis techniques, main findings and final remarks. This information was presented as absolute frequency (n) and relative frequency (%). Extraction of data on the discoveries of the findings section recorded the interpretations (descriptions and

Chart 1. Strategies employed in searching databases for this systematic review.

Database	Search strategy
Scientific Electronic Library Online (**Base 1**)	[All indexes]: *((HIV) OR ("síndrome de imunodeficiência adquirida" OR "acquired immunodeficiency syndrome")) AND ((coinfecção OR coinfection) OR (tuberculose OR tuberculosis) OR ("infecções oportunistas relacionadas com a aids" OR "AIDS-related opportunistic infections"))*
Web of Science (**Base 2**)	ALL=(((HIV) OR ("síndrome de imunodeficiência adquirida" OR "acquired immunodeficiency syndrome")) AND ((coinfecção OR coinfection) OR (tuberculose OR tuberculosis) OR ("infecções oportunistas relacionadas com a aids" OR "AIDS-related opportunistic infections")) AND (("pesquisa qualitativa" OR "qualitative research")))
Scopus (**Base 3**)	TITLE-ABS-KEY((HIV) OR ("síndrome de imunodeficiência adquirida" OR "acquired immunodeficiency syndrome")) AND TITLE-ABS-KEY((coinfecção OR coinfection) OR (tuberculose OR tuberculosis) OR ("infecções oportunistas relacionadas com a aids" OR "AIDS-related opportunistic infections")) AND TITLE-ABS-KEY(("pesquisa qualitativa" OR "qualitative research"))
Cumulative Index to Nursing & Allied Health Literature (**Base 4**)	((HIV OR "acquired immunodeficiency syndrome") Subject) AND ((coinfection OR tuberculosis OR "AIDS-related opportunistic infections") Subject) AND ((qualitative research) Subject)
Literatura Latino-Americana e do Caribe em Ciências da Saúde (**Base 5**)	[Title, abstract, subject] ((HIV) OR ("síndrome de imunodeficiência adquirida" OR "acquired immunodeficiency syndrome")) AND ((coinfecção OR coinfection) OR (tuberculose OR tuberculosis) OR ("infecções oportunistas relacionadas com a aids" OR "AIDS-related opportunistic infections")) AND (("pesquisa qualitativa" OR "qualitative research"))
Medical Literature Analysis and Retrieval System Online (**Base 6**)	((HIV OR "acquired immunodeficiency syndrome")[MeSH Terms]) AND ((coinfection OR tuberculosis OR "AIDS-related opportunistic infections")[MeSH Terms])) AND ((qualitative research[Title/Abstract]))
Base de Dados de Enfermagem (**Base 7**)	[Title, abstract, subject] ((HIV) OR ("síndrome de imunodeficiência adquirida" OR "acquired immunodeficiency syndrome")) AND ((coinfecção OR coinfection) OR (tuberculose OR tuberculosis) OR ("infecções oportunistas relacionadas com a aids" OR "AIDS-related opportunistic infections")) AND (("pesquisa qualitativa" OR "qualitative research"))
Índice Bibliográfico Español en Ciencias de la Salud (**Base 8**)	[Title, abstract, subject] ((HIV) OR ("síndrome de imunodeficiência adquirida" OR "acquired immunodeficiency syndrome")) AND ((coinfecção OR coinfection) OR (tuberculose OR tuberculosis) OR ("infecções oportunistas relacionadas com a aids" OR "AIDS-related opportunistic infections")) AND (("pesquisa qualitativa" OR "qualitative research"))
Pan American Health Organization – Institutional Repository Information Sharing (**Base 9**)	[Title, abstract, subject] ((HIV) OR ("síndrome de imunodeficiência adquirida" OR "acquired immunodeficiency syndrome")) AND ((coinfecção OR coinfection) OR (tuberculose OR tuberculosis) OR ("infecções oportunistas relacionadas com a aids" OR "AIDS-related opportunistic infections")) AND (("pesquisa qualitativa" OR "qualitative research"))
IndexPsi Periódicos (**Base 10**)	[Title, abstract, subject] ((HIV) OR ("síndrome de imunodeficiência adquirida" OR "acquired immunodeficiency syndrome")) AND ((coinfecção OR coinfection) OR (tuberculose OR tuberculosis) OR ("infecções oportunistas relacionadas com a aids" OR "AIDS-related opportunistic infections")) AND (("pesquisa qualitativa" OR "qualitative research"))

Source: Authors.

syntheses) and at least one supporting illustration (a primary datum originating in the data collection)[18].

These discoveries were then evaluated for congruency between interpretations and illustrations, as follows[18]: unquestionable discoveries were those that raised no doubts as to their consistency; questionable discoveries were those where the association between datum and illustration was dubious; and unsupported discoveries were those where the illustration did not match the interpretation. This process was performed by LVL and GP and discussed until the reviewers were in agreement (Supplementary Material 3, available at: https://data.mendeley.com/datasets/gfvc6kgjp6/4)[20].

The qualitative meta-synthesis took place in three stages[18]: the first involved extracting the interpretations (n = 90) with their respective illustrations; in the second, the discoveries were categorised, by their similarities in theory and concept, as unquestionable (n = 76) and questionable (n = 10), resulting in primary findings (n = 35), which were grouped into sub-themes (n = 8); and, in the third stage, synthesis of the categories yielded the themes (n = 4) and meta-theme (n = 1), the latter containing an inclusive, explanatory description and recommendation.

Presentation and interpretation of results

The meta-synthesis took the form of a progressive concentration of data from a larger number of findings, synthesising to a decreasing number of categories and results. In addition to building a synthesis table reflecting the aggregation process, it was decided to present the review findings graphically, representing them as thematic categories arising from the studies and contemplating their interrelations, with a view to understanding and explaining the phenomenon of interest[18].

Ethical considerations

For this study, the authors fulfilled the ethical responsibilities stipulated in Brazil by National Health Council Resolution No. 466, of 12 December 2012, and Resolution No. 674, of 6 May 2022. These norms categorise this study as risk-free, because it involves anonymous data in the public domain and does not involve research participants directly. Accordingly, the study was dispensed from assessment by the research ethics committee.

Results

The process of selecting from the databases and reference lists is illustrated in Figure 1. After application of the inclusion and exclusion criteria, this review comprised 11 studies[21-31]. By publication year, the articles numbered: 2010 (n = 1; 9%), 2012 (n = 1; 9%), 2015 (n = 1; 9%), 2019 (n = 1; 9%), 2020 (n = 2; 19%), 2021 (n = 2; 19%) and 2022 (n = 3; 27%). The studies originated predominantly in Brazil (n = 7; 64%), followed by South Africa (n = 1; 9%), Angola (n = 1; 9%), Ethiopia (n = 1; 9%) and Ukraine (n = 1; 9%) (Chart 2).

The studies included were primarily exploratory (n = 7; 64%), followed by descriptive (n = 3; 27%) and convergent-care (n = 1; 9%) studies. The data collection techniques employed were: individual interview (n = 7; 64%), triangulation of methods (n = 3; 27%) and focal group (n = 1; 9%). The quality of the studies included was rated as: 70% (n = 4; 36%), 80% (n = 1; 9%), 90% (n = 5; 45%) and 100% (n = 1; 9%). Other information on the studies is given in Table 2.

Extraction and analysis of the discoveries yielded a meta-theme, comprising four themes: (i) diagnosis and treatment of TB-HIV coinfection have impact on the life of the person involved; (ii) personal, social and economic vulnerabilities overlap in people with TB-HIV coinfection; (iii) drug burden and programme weaknesses impair treatment of TB-HIV coinfection; and (iv) support networks and care flows favour treatment of TB-HIV coinfection (Chart 3).

It was discovered that people with TB-HIV coinfection present bio-psycho-social needs resulting from the impact of the diagnosis, which adversely affect adherence. Moreover, they show a lack of knowledge of HIV and TB, engage in exposure and risk behaviour, depend on a heavy drug burden and experience inappropriate professional conduct. However, social and health care support was found to be important to fostering (self-)care and proper treatment follow-up (Figure 2).

Discussion

The findings of this systematic review revealed the complex, difficult realities of managing care for people with TB-HIV coinfection, which were associated with the burden of different therapeutic regimens, socioeconomic conditions and the social stigma attendant on both

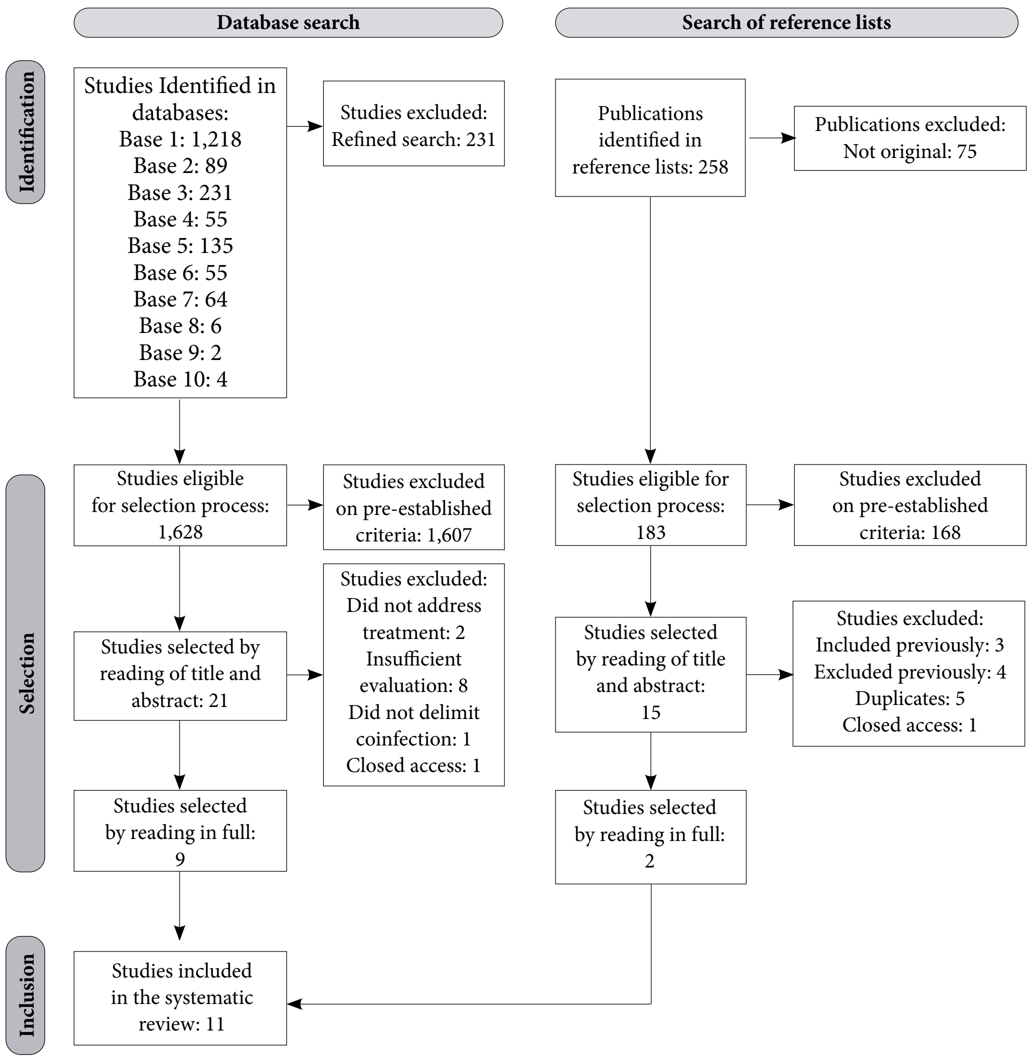

Figure 1. Search and selection process for studies for inclusion in this systematic review.

Source: Authors, based on the PRISMA checklist19.

infections. On the other hand, they reaffirmed the potential of public policies and measures to support health service organisation and bonding with the professional and social network in favour of proper treatment follow-up.

Quality of life is one of the main factors in assessing the health and wellbeing of people who live with HIV[32]. Some discussions have suggested that this construct should be understood in the light of (at that date) the 90-90-90 goals (90% of people living with HIV knowing their serological status, 90% of people living with HIV who know their status being on ART and 90% of people living with HIV on ART achieving viral suppression) – considering a "fourth 90" to be 90% of people who achieve viral suppression enjoying good quality of life[33,34].

However, a cross-sectional study that evaluated the quality of life of people living with HIV in Holland and England found that one third (35%) of the Dutch participants and nearly half (47%) the English participants reported anxiety and/or depression[34]. Note that several factors can contribute to these symptoms, such as the discovery of a diagnosis of HIV, its impact on relationships, stigmatisation, social isolation and the experience of living with a chronic disease[34], as were also identified in this review.

Chart 2. Extraction of data characterising the studies in this systematic review.

Identification, authors, title, journal and year	Theoretical and methodological frame of reference	Study participants and context	Data collection and analysis techniques	Main findings and authors' final remarks	Study quality
A1[21]: Silva ARS, Hino P, Bertolozzi MR, Oliveira JC, Carvalho MVF, Fernandes H, Sakabe S. Perceptions of people with tuberculosis/HIV regarding treatment adherence. Acta Paulista de Enfermagem. 2022.	Descriptive study, anchored in the conceptual planes of adherence proposed by Bertolozzi et al.	16 participants were recruited at an HIV referral centre in São Paulo state, Brazil.	Individual semi-structured interviews, with discourse analysis of the material collected.	The authors found that adherence to treatment for tuberculosis-HIV coinfection is a multifaceted phenomenon running through the health-disease process, the drug treatment and health service care. They stressed that bonding between users and health practitioners favoured adherence, as did support networks and financial benefits. On the other hand, the social stigma and prejudice attendant on these conditions were described as affecting treatment adherence adversely.	70%
A2[22]: Carvalho MVF, Silva ARS, Taminato M, Bertolozzi MR, Fernandes H, Sakabe S, Hino P. Tuberculosis/HIV coinfection focused on care and quality of life. Acta Paulista de Enfermagem. 2022.	Descriptive study guided by the quality of life and health care perspective and anchored in the theory of social determination of the health-disease process.	10 participants were recruited at a referral centre for HIV in São Paulo state, Brazil.	Individual semi-structured interviews, with discourse analysis of the material collected.	The authors considered that the organisation of the service, which was welcoming towards people with tuberculosis-HIV coinfection, and the support for treatment, including drugs free of charge, continuous monitoring and social support, influenced quality of life. On the other hand, the discovery of coinfection had impact on people's lives, and affected their mental and biological health, particularly as regards (self-)stigma, side effects and diagnosis denial.	80%
A3[23]: Cameia SS, Meirelles BHS, Costa VT, Souza SS. Challenges in tuberculosis coinfection treatment in people with HIV/AIDS in Angola. Texto & Contexto – Enfermagem. 2020.	Convergent-care type study anchored in the principles proposed by Trentini, Paim & Silva.	29 participants, 18 of them with tuberculosis-HIV coinfection and 11 health care practitioners, were recruited at a hospital in Huambo province, Angola.	Triangulation of data from individual interviews, participant observation and convergence group. Content analysis was used on the material collected.	The authors revealed a variety of challenging situations facing and reported by people undergoing treatment for tuberculosis-HIV coinfection and which influence adherence (e.g., adverse drug reactions, difficulties accessing services, stigma, prejudice and isolation, socioeconomic problems, living in fear and shame, and changes in their way of life and lifestyle).	90%

it continues

Chart 2. Extraction of data characterising the studies in this systematic review.

Identification, authors, title, journal and year	Theoretical and methodological frame of reference	Study participants and context	Data collection and analysis techniques	Main findings and authors' final remarks	Study quality
A4[24]: Silva JB, Cardoso GCP, Ruffino Netto A, Kritski AL. Os significados da comorbidade para os pacientes vivendo com TB/HIV: repercussões no tratamento. Physis: Revista de Saúde Coletiva. 2015.	Exploratory study, designed on the basis of social constructionism as a theoretical framework.	10 participants were recruited at a tuberculosis outpatient clinic at a university hospital in Rio de Janeiro state, Brazil.	Individual semi-structured interviews. Content analysis was used on the material collected.	The authors showed that the treatment context was influenced by the surprise at the diagnosis of HIV and by the feeling of stigma associated with tuberculosis, which strongly affected bio-psycho-social wellbeing. Drug side effects were considered negative points, while the feeling of self-caring maintained patients' affirmative attitude to their own life. Social and family support was seen as a major contribution to treatment follow-up, as was the establishment of a receptive relationship with service health care practitioners.	90%
A5[25]: Sousa Filho MP, Luna IT, Silva KL, Pinheiro PNC. Pacientes vivendo com HIV/aids e coinfecção tuberculose: dificuldades associadas à adesão ou ao abandono do tratamento. Revista Gaúcha de Enfermagem. 2012.	Exploratory study with no explicit guiding theoretical framework.	7 participants were recruited at a referral hospital for infectious diseases in Ceará state, Brazil.	Individual semi-structured interviews. The material collected was treated by collective subject analysis.	The authors discovered that people undergoing treatment for tuberculosis-HIV coinfection attribute the difficulties in adherence to themselves. Factors with adverse effects included treatment difficulties and lifestyle, problems with the duration of therapeutic regimens and confusion over doses, and continuous or recreational use of licit and illicit drugs.	70%

it continues

Also, this complexity of factors is accentuated by the presence of TB. A study in a city in India found that, on average, people with TB-HIV scored significantly lower in the quality of life-related domains than those with HIV alone[35]. In that regard, studies of this public's needs and difficulties in experiencing the health-disease process can collaborate in identifying demands and promoting quality of life[36].

Coinfection with TB can also have an impact on the socioeconomic context of people with HIV. A mixed-method study of people with TB found that, even after treatment, recovery of income and employment was limited, financial difficulties persisted and interruptions to schooling continued[37]. This scenario underlines the need for social protection programmes for people with coinfection, given the potential

Chart 2. Extraction of data characterising the studies in this systematic review.

Identification, authors, title, journal and year	Theoretical and methodological frame of reference	Study participants and context	Data collection and analysis techniques	Main findings and authors' final remarks	Study quality
A6[26]: Aibana O, Dauria E, Kiriazova T, Makarenko O, Bachmaha M, Rybak N, Flanigan TP, Petrenko V, Becker AE, Murray MB. Patients' perspectives of tuberculosis treatment challenges and barriers to treatment adherence in Ukraine: a qualitative study. BMJ Open. 2020.	Exploratory study, designed on the structural model of the dimensions of long-term therapy adherence proposed by the World Health Organisation.	60 participants, 19 of them with and 41 without HIV, were recruited at a referral hospital for tuberculosis in the Kiev region of Ukraine.	Individual semi-structured interviews, using NVivo® software, version 11.0, to facilitate coding of material collected.	The authors identified structural barriers related to centralised tuberculosis services, the economic impacts of treatment, the psychological burden of illness and the patients' relations with health care practitioners. Also highlighted was the use of excessive drugs. These challenges to treatment adherence were similar for persons with or without HIV or other risk factors.	100%
A7[27]: Reis AA, Alecrim TFA, Zerbetto SR, Palha PF, Ruggiero CM, Protti-Zanatta ST. Live/cope with tuberculosis/HIV and the meanings represented by the illness process: a discourse analysis. Ciência, Cuidado e Saúde. 2021.	Exploratory study with no explicit guiding theoretical framework.	6 participants were recruited at a referral centre for chronic infections in São Paulo state, Brazil.	Individual semi-structured interviews, using the Atlas Ti® software, version 7.0, to facilitate discourse analysis of the material collected.	The authors showed that people undergoing treatment for tuberculosis-HIV coinfection experience a lack of knowledge of the infections. Blame is also attached to the illness, which is attributed to risk behaviour, such as unprotected sexual relations and drug use. To this was added the influence of stigma and prejudice resulting from the infections, and reproduced in support networks. On the other hand, relations with health care practitioners potentially favoured adherence.	70%

it continues

for improved rates of cure and treatment adherence[38].

Other factors with adverse impact on the experiences of people with TB-HIV were their scant knowledge about the infections and engaging in risk habits, such as alcohol and drug use. Meanwhile, note that health education strategies can be fundamental to follow-up, because they enable the coinfected person and collaborate towards a willingness to engage in (self-)care[39,40]. These measures can even motivate a change away from risk behaviour, with a view to strengthening adherence to therapy[39,41].

Weak treatment adherence was intrinsically related to high drug burden. Research has shown that the occurrence of potential interactions between drugs, additive drug toxicities and problems of tolerability can undermine the treatment management process[41-43]. Nonetheless, the current combination of TB drugs with

Chart 2. Extraction of data characterising the studies in this systematic review.

Identification, authors, title, journal and year	Theoretical and methodological frame of reference	Study participants and context	Data collection and analysis techniques	Main findings and authors' final remarks	Study quality
A8[28]: Daftary A, Mondal S, Zelnick J, Friedland G, Seepamore B, Boodhram R, Amico KR, Padayatchi N, O'Donnell MR. Dynamic needs and challenges of people with drug-resistant tuberculosis and HIV in South Africa: a qualitative study. The Lancet Global Health. 2021.	Exploratory study, nested in a prospective cohort and designed according to Bury's biographical disruption theory.	55 participants were recruited at a centralised tertiary hospital in the KwaZulu-Natal province of South Africa.	Semi-structured focal groups and comprehensive thematic analysis of material collected.	The authors found that treatment of HIV and drug-resistant tuberculosis was permeated by four stages, which posed different challenges: diagnosis, notable for centralised hospitalisation, renunciation of routine life, the systemic stigmatisation and destabilisation of HIV; start of treatment, with side effects, isolation and social disconnection; discharge, with a brief reprieve and resurgent social and therapy disruption; and continuity, with worsening socioeconomic challenges, despite clinical recovery.	90%
A9[29]: Resende NH, Martins UCM, Ramalho-de-Oliveira D, Silva DI, Miranda SS, Reis AMM, Carvalho WS, Mendonça SAM. The medication experience of TB/HIV coinfected patients: qualitative study. International Journal of Environmental Research and Public Health. 2022.	Quali-quantitative descriptive study, designed from the perspective of pharmaceutical care practice as its frame of reference.	81 participants were recruited at a referral hospital in Minas Gerais state, Brazil.	Individual semi-structured interviews and field diaries, using thematic analysis on the material collected.	From the qualitative analysis, the authors identified themes including adversity, socially constructed aspects, resolvability and ambivalent feelings. Experiences revealed included denial of the diagnosis and treatment of the diseases, lack of knowledge and information on the drugs and their adverse effects, shame at taking medication in the presence of other people and feeling threatened, imprisoned and anxious in advance of the treatment. On the other hand, participants expressed recognition and acceptance of the treatment as a solution for better quality of life.	70%

it continues

ART, at the right dosage and correctly timed onset, has produced appropriate clinical response and acceptable safety[41].

At present, unlike the Brazilian Ministry of Health's previous guidelines, it is recommended that persons with concomitant HIV-TB diagnoses should be treated for both infections, with a view to reducing related mortality[44]. Depending on the T-CD4+ lymphocyte count, ART should be started by the second week or on the eighth

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Identification, authors, title, journal and year	Theoretical and methodological frame of reference	Study participants and context	Data collection and analysis techniques	Main findings and authors' final remarks	Study quality
A10[30]: Rossetto M, Maffacciolli R, Rocha CMF, Oliveira DLLC, Serrant L. Tuberculosis/HIV/AIDS coinfection in Porto Alegre, RS/Brazil - invisibility and silencing of the most affected groups. Revista Gaúcha de Enfermagem. 2019.	Exploratory study designed in the light of the Sound of Silence methodology and set in the theoretical framework of vulnerability and human rights.	20 participants were recruited at tuberculosis treatment referral centres in three management districts in Rio Grande do Sul state, Brazil.	Individual semi-structured interviews, with the Sound of Silence methodology used to analyse the material collected.	The authors reported that, in treatment for tuberculosis-HIV coinfection, the people affected felt they were made invisible and silenced, which had adverse impact on their recovery. That process was permeated by a lack of guidance from health care practitioners, precarious health care service access and follow-up, socioeconomic adversities and risk behaviour and exposure, including unprotected sexual relations and alcohol and drug use. These situations were described as weaknesses in patient follow-up and as facilitating treatment dropout.	90%
A11[31]: Gebremariam MK, Bjune GA, Frich JC. Barriers and facilitators of adherence to TB treatment in patients on concomitant TB and HIV treatment: a qualitative study. BMC Public Health. 2010.	Exploratory study inspired in the perspective of a theoretical framework for health-related behaviour.	35 participants (29 tuberculosis-HIV coinfected and 6 health care practitioners) were recruited at health centres in the Addis-Ababa administrative region, Ethiopia.	Triangulation of data originating from individual interviews and semi-structured focal groups. Material collected was analysed by the Giorgi phenomenological method, as modified by Malterud.	The authors found an interplay of factors in decision-making about concomitant tuberculosis-HIV treatment. Factors with a positive influence on tuberculosis treatment adherence were belief in the disease's severity and curability, when in the presence of HIV, and support from families and health care practitioners. The barriers to treatment adherence were side effects, pill burden, economic constraints, stigma and lack of suitable communication between patients and health care practitioners.	90%

Source: Authors.

week of anti-TB treatment; for persons with HIV on ART prior to diagnosis of TB, treatment for TB should begin immediately[44].

In addition, a lack of coordination between levels of health care and a fragile relationship with health practitioners also undermined treatment for TB-HIV coinfection. An ecological study in one Brazilian state identified greater occurrence of coinfection in municipalities with strong coverage by the Family Health Strategy[45]. Its authors suggested that care is fragmented and reactive, with little prospect of integrating care or of prioritising prevention and promotion measures for chronic conditions[45].

Chart 3. Synthesis of unquestionable and questionable discoveries in the studies in this systematic review.

Finding	Subtheme	Theme	Meta-theme
The discovery and consequent fear of tuberculosis-HIV coinfection have impact on patient's psychology[21,23,24]. Treatment for tuberculosis-HIV coinfection involves and affects moral, religious, psychosocial, emotional and sexual aspects of the patient's life[21,22,27]. Exposure to the diagnosis of tuberculosis-HIV coinfection affects the patient's everyday life and interpersonal relations[21,22]. People with tuberculosis-HIV coinfection experience lack of support and social exclusion, even by the family, which jeopardises adherence to care[23,25,26,28]. Patient denial and indifference to the diagnosis of tuberculosis-HIV coinfection jeopardise treatment adherence[29]. The stigma, shame and prejudice experienced and perceived by people with tuberculosis-HIV coinfection impair quality of life and adherence to treatment[20-22,25-28,30]. The desire for the diagnosis to be kept confidential and fear of breach of confidence are influences on patients' taking, or dropping out from, medication to treat tuberculosis-HIV coinfection[24,31]. Patients see tuberculosis-HIV coinfection as punishment by supernatural entities[23].	The discovery, and possibility of disclosure, of the diagnosis of tuberculosis-HIV coinfection run through various different spheres of life and adversely affect every day (self-)care and relational activities.	**The diagnosis and treatment of tuberculosis-HIV coinfection have impact on patients' lives:** People with tuberculosis-HIV coinfection have bio-psycho-social needs, from diagnosis through treatment, which need to be considered as inherent to the care process, with a view to reducing the prejudices and taboos connected with a comprehensive approach to promoting quality of life.	**Adverse and beneficial experiences coexist in a context of vulnerabilities resulting from the experiences of people with tuberculosis-HIV coinfection:** The experiences that run from the diagnosis through treatment for the infections, as well as the factors that facilitate and hinder this process, need to form part of the repertoire of care actions and strategies directed to this population, so as to shorten the pathway to elimination of tuberculosis and HIV as public health problems.

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In the Brazilian context, it is suggested that TB treatment should be decentralised to primary healthcare; in cases of coinfection with HIV, the patient is referred to follow-up shared, in principle, with specialised care services[44]. At times, however, the specialised services take over treatment completely, thus contributing to a persistent lack of care integration in the system, which can hinder access and adherence to treatment among people in more distant and peripheral areas.

It is essential to consider the historical and cultural influence of the stigma and prejudice attendant on these conditions: on the one hand, they affect patients' choices of follow-up services and, on the other, underlie a possible lack of care on the part of health practitioners, resulting from insecurity in dealing with this population. This underscores the importance of firmly established flows between local and regional care networks, with epidemiological surveillance playing a leading role, so as to favour sharing of information on which to base care.

Establishing integrated, proactive lines of care must be a priority for TB and HIV control programmes. Some collaborative diagnostic

Chart 3. Synthesis of unquestionable and questionable discoveries in the studies in this systematic review.

Finding	Subtheme	Theme	Meta-theme
Discouragement and suicidal ideation resulting from the illness have adverse effects on the quality of life of the tuberculosis-HIV coinfected[22,28]. The fear of death from the infections persists as a common feeling among people undergoing treatment for tuberculosis-HIV coinfection[23,24]. People with tuberculosis-HIV coinfection regard the treatment ambivalently, because it permits quality of life, but constantly reminds them of the diseases[24,31]. The need for constant healthcare leads to stress in the lives of the tuberculosis-HIV coinfected[21]. People with tuberculosis-HIV coinfection feel blamed for the illness and for possible transmission to partners[23]. Worsening health and the consequent need for hospital admission have adverse impact on the psychology of people with tuberculosis-HIV coinfection[26].	Tuberculosis--HIV coinfection prejudices patients' mental health and causes feelings of fear of death, demotivation, guilt, stress and suicidal ideation resulting from the illness	**The diagnosis and treatment of tuberculosis-HIV coinfection have impact on patients' lives:** People with tuberculosis-HIV coinfection have bio-psycho--social needs, from diagnosis through treatment, which need to be considered as inherent to the care process, with a view to reducing the prejudices and taboos connected with a comprehensive approach to promoting quality of life.	**Adverse and beneficial experiences coexist in a context of vulnerabilities resulting from the experiences of people with tuberculosis-HIV coinfection:** The experiences that run from the diagnosis through treatment for the infections, as well as the factors that facilitate and hinder this process, need to form part of the repertoire of care actions and strategies directed to this population, so as to shorten the pathway to elimination of tuberculosis and HIV as public health problems.
Discovery and treatment of tuberculosis-HIV coinfection adversely affects the labour dynamics of the coinfected[23,26,28,30]. Diet-related difficulties jeopardise the continuity of treatment for tuberculosis-HIV coinfection[25,30]. Precarious conditions of housing and life have adverse effects on adherence to treatment for people with tuberculosis-HIV coinfection[30]. Recreational or excessive use of alcohol and illicit or illicit drugs weakens adherence to treatment for tuberculosis-HIV coinfection[23,25,26,30]. Lack of transport from home to health services weakens follow-up to treatment for people with tuberculosis-HIV coinfection[25,27].	Precarious conditions of life and travel, financial losses, alcohol and drug use and inappropriate diet all jeopardise follow-up to treatment for tuberculosis-HIV coinfection.	**Personal, social and economic vulnerabilities overlap in people with tuberculosis-HIV coinfection:** Coinfected patients have demands, such as the lack of knowledge about exposure and risk conditions and behaviour, which call for inter-sector and multi-profession attention in order to mitigate the numerous different barriers affecting adherence to treatment for tuberculosis-HIV coinfection.	

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and treatment policies applied in Latin America and the Caribbean have offered simultaneous testing for both infections and provided TB and HIV therapies in decentralised services. These have performed well in responding to the infections[46]. Nonetheless, there is a persistent need to reinforce coordination in health service provision.

In this review, the people undergoing treatment for TB-HIV coinfection stressed the im-

Chart 3. Synthesis of unquestionable and questionable discoveries in the studies in this systematic review.

Finding	Subtheme	Theme	Meta-theme
Failure of tuberculosis treatment discourages people living with HIV from adhering to treatment for coinfection by tuberculosis[28]. Lack of correct, sure knowledge of the infections and medications, is a reality among people undergoing treatment for tuberculosis-HIV coinfection[26,28-30]. The desire to prioritise lifestyle change to the detriment of medication use is experienced among people with tuberculosis-HIV coinfection[29].	Tuberculosis-HIV coinfection patients' lack of knowledge about the treatment weakens continuity and adherence, as do cases of regimen failure.	**Personal, social and economic vulnerabilities overlap in people with tuberculosis-HIV coinfection:** Coinfected patients have demands, such as the lack of knowledge about exposure and risk conditions and behaviour, which call for inter-sector and multi-profession attention in order to mitigate the numerous different barriers affecting adherence to treatment for tuberculosis-HIV coinfection.	**Adverse and beneficial experiences coexist in a context of vulnerabilities resulting from the experiences of people with tuberculosis-HIV coinfection:** The experiences that run from the diagnosis through treatment for the infections, as well as the factors that facilitate and hinder this process, need to form part of the repertoire of care actions and strategies directed to this population, so as to shorten the pathway to elimination of tuberculosis and HIV as public health problems.
The heavy burden of different drugs, their regimens and adverse effects prejudice adherence to treatment for tuberculosis-HIV coinfection[23,25,28,29,31]. The need to travel daily to the health service for directly observed treatment jeopardises follow-up to treatment for tuberculosis-HIV coinfection[26,31]. The lack of medication free of charge at health services weakens strict follow-up of care by people with tuberculosis-HIV coinfection[29].	Therapeutic regimens with multiple—and sometimes scarce—drugs and the need for daily observation of dose administration make treatment for tuberculosis-HIV coinfection difficult.	**Drug burden and programme weaknesses prejudice treatment for tuberculosis-HIV coinfection:** Coinfected patients depend on a heavy drug burden and experience inappropriate professional conduct, pointing to a need for strategies designed to inform the work process and proposals for individualised, person-centred care plans, with a focus on self-care.	

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portance of care flows and service organisation. A study in one Brazilian municipality's outpatient service found that a regular supply of drugs, periodical testing for the infections at the facility itself and flexible appointment scheduling were factors that, jointly with the relationship and bond to the multi-profession staff, strengthened adherence to TB-HIV treatment[47].

It is important to consider, from the perspective of people with coinfection, the decisive role of social and family support to follow-up care. A cross-sectional study in the capital city of Peru found that social support and quality of care significantly influenced the health education of people infected with TB[48]. The study's authors also found that health education collaborated with social support and quality of care to provide opportunities for improving treatment adherence[48].

The findings of this review ratify the appropriateness of multi- and inter-sector care as a priority for combating these infections, particu-

Chart 3. Synthesis of unquestionable and questionable discoveries in the studies in this systematic review.

Finding	Subtheme	Theme	Meta-theme
The shortage of health care practitioners impairs the duration of care and the interval between appointments for people undergoing treatment for tuberculosis-HIV coinfection[23]. Health care practitioners' disregard of patient complaints and needs hinders follow-up of care among people with tuberculosis-HIV coinfection[26]. Lack of effective and problem-solving communication between health care practitioners and patients weakens the health education process directed to people undergoing treatment for tuberculosis-HIV coinfection[26,30]. The invisibility of people with tuberculosis-HIV coinfection to healthcare practitioners and services leads to a worsening of their clinical condition[30].	The lack of communication, scarcity of human resources and neglect by health care practitioners have adverse impact on the process of enabling patients for self-care and on follow-up of people undergoing treatment for tuberculosis-HIV coinfection.	**Drug burden and programme weaknesses prejudice treatment for tuberculosis-HIV coinfection:** Coinfected patients depend on a heavy drug burden and experience inappropriate professional conduct, pointing to a need for strategies designed to inform the work process and proposals for individualised, person-centred care plans, with a focus on self-care.	**Adverse and beneficial experiences coexist in a context of vulnerabilities resulting from the experiences of people with tuberculosis-HIV coinfection:** The experiences that run from the diagnosis through treatment for the infections, as well as the factors that facilitate and hinder this process, need to form part of the repertoire of care actions and strategies directed to this population, so as to shorten the pathway to elimination of tuberculosis and HIV as public health problems.
Persons living with HIV tend to recognise the importance of committing to adherence to treatment for the infections when confronted with a diagnosis of coinfection by tuberculosis[21,25]. Support from and close bonding with health care practitioners strengthen follow-up of treatment for tuberculosis-HIV coinfection[21,24,26-28,31]. Social and family support stand out as a means of strengthening the process of care for people with tuberculosis-HIV coinfection, by assisting adherence to therapy[24,27,31]. Religious belief is perceived as a motivation and a support for follow-up of care among people with tuberculosis-HIV coinfection[24,28,29].	Proper treatment for people with tuberculosis-HIV coinfection could be implemented and continued better if supported through close relationships with families, religious figures, friends and health care practitioners.	**Support networks and care flows sustain treatment for tuberculosis-HIV coinfection:** The tuberculosis-HIV coinfected need social and health support to produce proper follow-up of care, revealing the importance of partnering with different actors and services in order to assure that the measures offered to these people are comprehensive and longitudinal.	

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larly TB[6,9,10,49]. This thinking converges with the World Health Organisation's framework of collaborative and inter-sector measures against TB, which is designed to support countries in introducing and expanding comprehensive services centred on persons with TB and considering their comorbidities (such as HIV) and health risk factors, in order to accelerate the response by efforts to combat the disease[50].

In Brazil, for example, Decree No. 11,494, of 17 April 2023, instituted the *Comitê Interministerial para a Eliminação da Tuberculosis e de Outras Doenças Determinadas Socialmente* (CIEDDS), with a view to proposing broad, structural policies going beyond appropriate and universal treatment, to focus on access to healthcare and sanitation measures, social inclusion, education, housing and so on. The ac-

Chart 3. Synthesis of unquestionable and questionable discoveries in the studies in this systematic review.

Finding	Subtheme	Theme	Meta-theme
Proper work process organisation in healthcare services leads to satisfaction with health care measures destined for people undergoing treatment for tuberculosis-HIV coinfection[22]. In response to a tuberculosis-HIV coinfected patient's worsening condition, hospital admission assists in establishing a routine for drug administration, because of the fixed timetable in place in hospital[28].	Proper flow along the line of care, between levels of care and the person living with HIV and infected with tuberculosis, acts to strengthen treatment adherence.	**Support networks and care flows sustain treatment for tuberculosis-HIV coinfection:** The tuberculosis-HIV coinfected need social and health support to produce proper follow-up of care, revealing the importance of partnering with different actors and services in order to assure that the measures offered to these people are comprehensive and longitudinal.	**Adverse and beneficial experiences coexist in a context of vulnerabilities resulting from the experiences of people with tuberculosis-HIV coinfection:** The experiences that run from the diagnosis through treatment for the infections, as well as the factors that facilitate and hinder this process, need to form part of the repertoire of care actions and strategies directed to this population, so as to shorten the pathway to elimination of tuberculosis and HIV as public health problems.

Source: Authors.

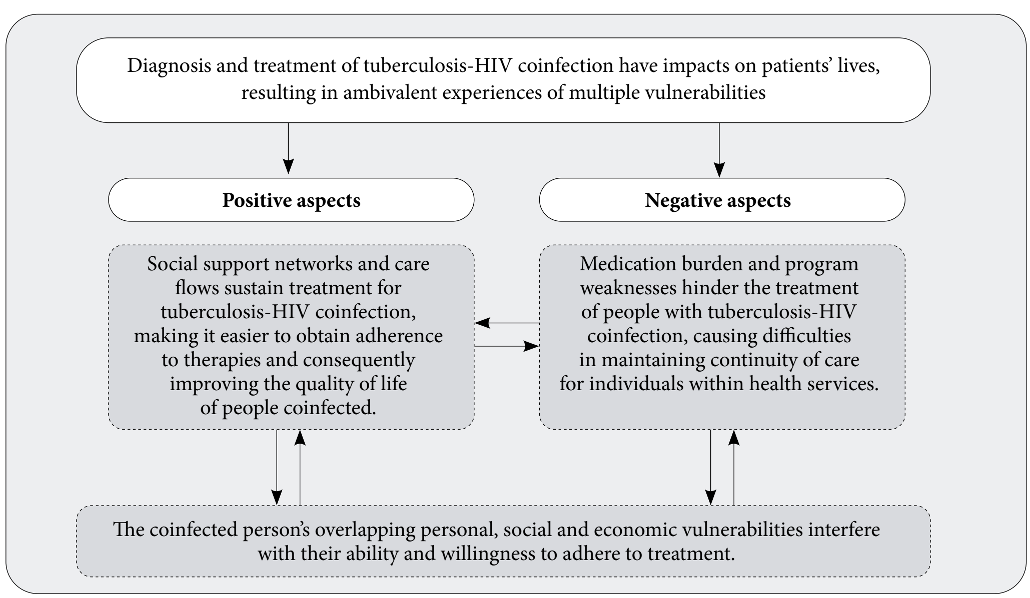

Figure 2. Graphic representation of the meta-theme originating from this systematic review.

Source: Authors.

tions of the CIEDDS should be evaluated and, if effective, can inspire countries' efforts to eliminate TB and HIV by 2030.

In view of the foregoing, this systematic review will contribute to proposing and informing public policies, given that it has thrown in-depth theoretical light on the experiences of people undergoing treatment for TB-HIV coinfection. Accordingly, strategies designed to improve bonding and adherence to the care directed to this population should consider the individual, social and programmatic experiences revealed in this study and contemplate also the specific geographic and cultural features of the populations and countries involved.

Although there was no need for a minimum number of studies in this meta-synthesis[18], one limitation of this review is the small number of publications resulting from either the lack of studies or the inclusion process. In the latter case, this situation may have resulted from the language restrictions on the search and/or on the selection process; however, no potentially eligible studies in other languages were found. Any studies indexed in databases not considered by this review would also not have been included.

Final remarks

This systematic review offered insights into the ambivalence of the experiences of people undergoing treatment for TB-HIV coinfection. The findings corroborate the need to formulate individual therapeutic projects and to propose singular strategies and interventions designed to offer opportunities for access and bonding to services and adherence to therapies. Moreover, they highlighted the need to implement and strengthen flows of information and action among health services in the care network.

It is also important that the response to combat these conditions rest on inter-sector action engaging the partners involved at all stages of care for the population, from the development of care plans to proposals for committees and laws to safeguard the right to basic health services and social wellbeing. In this way, one of the steps towards accelerating the response to eliminate these infections by 2030 is to take into consideration the specific features of the experiences of people undergoing treatment for TB and HIV.

Lastly, it is suggested that qualitative studies be undertaken to expand the understanding of the coexistence of TB and HIV beyond (non-) adherence to treatment. It would be a good idea to consider other actors involved in these experiences, such as relatives, friends and health practitioners. Moreover, such studies must seek to be more: (i) theoretically robust, by selecting frames of reference that sustain the interpretation of their data; and (ii) methodologically robust, moving beyond the descriptive-exploratory plane to become explanatory and interpretative.

Collaborations

LV Lima and G Pavinati: study conception and design, data collection, search of references, data analysis and interpretation, drafting of the article, critical review and approval of the final version. AJR Barrêto, MA Salci, MS Barreto and GT Magnabosco: data analysis and interpretation, critical review and approval of the final version.

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