

Health-related lifestyle in HIV/AIDS patients: a hybrid concept analysis

Mehrnoosh Khoshtarash¹, Mansoureh Ashghali Farahani¹, Armin Zareiyan²

¹Nursing Care Research Center (NCRC), School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran

²Department of Public Health Nursing, Nursing Faculty, Aja University of Medical Sciences, Tehran, Iran

Abstract

Introduction: The concept of lifestyle is closely related to the concept of health. Several studies have been conducted on the dimensions of health-related lifestyle in patients living with human immunodeficiency virus/acquired immunodeficiency disease (HIV/AIDS), but none has comprehensively addressed it. This study is carried out for the purposes of defining and clarifying its concept in HIV/AIDS patients.

Material and methods: This study used a hybrid model of concept analysis comprising three phases; namely, a theoretical phase, field work phase, and a final analysis phase. To find relevant literature, an electronic search of valid databases was utilised using keywords related to the concept of health-related lifestyle. In the field work phase semi-structured interviews were performed with 12 people living with HIV/AIDS. The conventional content analysis was used in two theoretical and field work phases, and the results were combined in the final analysis phase.

Results: From the sum of 1362 gained titles in theoretical phase, 71 texts were analysed and five attributes were extracted, including physical health behaviours, social and recreational activities, sexuality and fertility health, health-centred care, and distress and coping. The most important consequence of a healthy lifestyle in literature review is enhanced physical and mental health. Working in the field phase added a social interactions category to the feature of the concept. In the third phase with the combination of the results of two phases, the final definition of the concept was presented.

Conclusions: Health-related lifestyle in HIV/AIDS patients is a set of behaviours that have different physio-psycho-social dimensions that people display in their individual and social lives, thereby providing their physical and mental health.

HIV AIDS Rev 2019; 18, 2: 120-130
DOI: <https://doi.org/10.5114/hivar.2019.86376>

Key words: lifestyle, HIV, AIDS, health behaviours.

Introduction

Although since the first pandemic of human immunodeficiency virus/acquired immunodeficiency disease (HIV/AIDS) has been around for decades, it is still recognised as one of the most important infectious diseases in the world today [1]. The significance of the disease can be traced back

to 76.3 million people and 35 million deaths since the onset of the epidemic. The data provided in 2017 also indicate 36.9 million people worldwide, 1.8 million new cases, and about 1 million deaths associated with the disease [2].

Although improvements have been made in the treatment of aids, the aids virus is still a public health problem worldwide. Prevention, early diagnosis, and serious treatment

Address for correspondence: Mansoureh Ashghali Farahani, BSCN, MSCN, PhD, Associate Professor, Nursing Care Research Centre (NCRC), School of Nursing and Midwifery, Iran University of Medical Sciences, Rashid Yasemi St., Valiasr Ave., Tehran, Iran, phone: +98214365223, fax: +9821 88201978, e-mail: farahani.ma@iums.ac.ir, m_negar110@yahoo.com

Article history:
Received: 12.12.2018
Received in revised form: 31.12.2018
Accepted: 05.02.2019
Available online: 20.05.2019

International Journal
of HIV-Related Problems

**HIV & AIDS
Review**

of the disease are important aspects of care for affected people, with which nurses deal with these patients in all of these areas. In this regard, admission of lifestyle and new behaviours consistent with this disease is one of the major concerns that a nurse faces in caring for affected people [3].

Lifestyle is defined as all behaviours that are under the control of a person or affect the health of the individual and it includes all behaviours such as eating habits, sleep and rest, physical activity and exercise, weight control, immunisation against disease, stress adjustment, and the ability to use family and community support [4]. In other words, lifestyle is a normal and daily activity that people have accepted into their lives in an acceptable way so that these activities affect their health [5]. The concept of lifestyle is closely related to the concept of health [6], and today most health problems are related to lifestyle and changes in lifestyle [7]. The World Health Organisation (WHO) believes that changing lifestyle can be countered by many risk factors that are among the most important causes of mortality [8]. Therefore, one of the goals of the WHO by 2020 is to promote a healthy lifestyle in the community, according to which countries should put in place strategies that are effective in improving individual and social life [4].

Several quantitative and qualitative studies are conducted on the dimensions of care for HIV/AIDS patients and their life experiences, including patient compliance with antiretroviral therapy (ART), social stigma, nutrition, and the prevention of transmission of disease to others, especially in risk groups, have been conducted in the world, all of which are dimensions of lifestyle, but none has comprehensively addressed the health-related lifestyle of these individuals. Interestingly, in spite of the general definitions given in various texts of the word life style, Lyons and he in various papers believe that until now a comprehensive and complete definition that contains all the hidden angles of this concept is not provided and, of course, is emphasised. It is not possible to do this except by considering the mental aspects of the concept and the exact understanding of the grounds upon which the lifestyle is formed [9, 10]. Therefore, considering the high prevalence of AIDS and the importance of lifestyle in the management of people with this disease, proper understanding and accurate assessment of the concept of lifestyle and health behaviours in the formulation and implementation of health plans for prevention and the promotion of the health, care, and treatment of these people it is essential.

In this regard, the present study was conducted to analyse the health-related lifestyle (HRL) in people with HIV/AIDS (PLWHA), based on the hybrid model. Using the hybrid method based on the literature review as well as the life experience of the participants in the field can provide more accurate information about the concepts. The hybrid model depicts a clear picture of concepts based on the context and specific situation and, in this respect, has superiority to other conceptual analysis methods [11].

This paper tries to answer the following questions by using the concept of hybrid analysis:

1. How is the health-related lifestyle of people living with HIV/AIDS defined in the literature, and what are the properties, antecedents, and the consequences of this concept?
2. What do people with HIV/AIDS define or experience in their health-related lifestyle?

Material and methods

In this study, the concept of HRL in PLWHA was analysed using a hybrid model. The model consists of three theoretical phase, field work, and final analysis.

Theoretical phase

The present study employed a systematised, evidence-based approach to search the literature. This method includes one or more characteristics of a systematic review, but does not claim to present the same results as a systematic review does [12]. In this phase, the databases of Medlib, Iran Medex, Magiran, Sid, Irandoc, Web of Science, Google Scholar, Cinahl, PubMed, Medline, Proquest, Ovid, Elsevier, and Wiley were searched by a combination of keywords (lifestyle, health-related lifestyle, HIV, AIDS, health behaviours, quality of life), both in English and Persian, without time limit, and up to the end of 2017. According to inclusion criteria, articles with full text in Persian or English, and referring to the definition, outcomes, features, and outcomes of the concept of HRL, were evaluated. Exclusion criteria included repetitive texts, book reviews, letters to the editor, and unrelated texts. Figure 1 shows the process of reviewing and selecting texts at the theoretical stage. As shown in the figure, after the removal of repetitive texts and then the evaluation of the abstract of the texts in terms of relation with the concept, the full text of the articles that were qualified and relevant to the concept was investigated. Accordingly, from 885 titles obtained in the initial search, 68 research articles and three dissertations entered the analysis stage. Among the texts, 15 cases were reported in Asia, 29 in the United States, 22 in Africa, and five in Europe. Table 1 presents an overview some of studies conducted on HRL in PLWHA.

To analyse the literature, the conventional content analysis method was used based on the model proposed by Graneheim and Lundman. The texts were carefully studied by the researcher as a unit of analysis several times and summarised by meaning units. Each sentence, phrase, and a word referring to the definition and dimensions of the HRL in people with HIV/AIDS were identified, and each was assigned a code. The codes were categorised by performing continuous comparisons in different categories and subcategories according to their repetition, differences, and similarities.

Field work phase

Field phase data were collected from 12 HIV/AIDS patients referring to the behavioural disease counselling

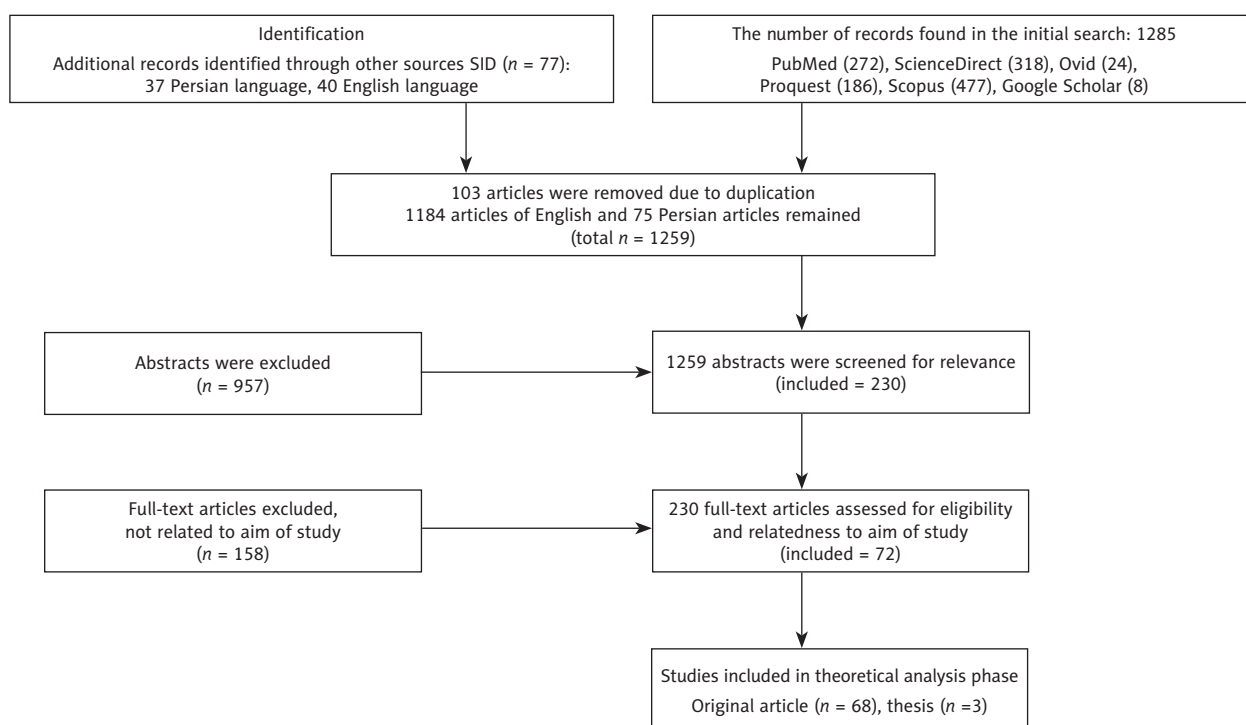


Figure 1. Summary of the theoretical phase based on the PRISMA flowchart (selection, critical appraisal, and data extraction of studies)

centres of Imam Khomeini Hospital (Tehran) and Rasht, from April to September 2018. In this phase, the views of PLWH on HRL were addressed. To select participants, a purposeful sampling approach was used, and attempts were made to comply with principles of maximum variation sampling. Participants with the ability to express their experiences in Persian and a willingness to participate in the study were included in the study. The general information of participants is presented in Table 2. In this phase, qualitative data were collected through individual, semi-structured, face to face, and thorough interviews by asking open questions and continuation until data saturation. Initially, the first interview was conducted by the first author (M.Kh.), and after having been approved by other members of the research team, the subsequent interviews were conducted. The interviews began with a broad and general question (for example: What do you normally do during the day?), and then exploratory questions were asked to encourage participants and gain more in-depth information (for example: How is your physical activity? What do you eat during the day? Explain your sleep situation). In other words, the following questions were asked based on the initial responses of the people and the interview guide. In the cases where the participant put forward a subject whose search was useful, the researcher also followed suit. The location and time of the interview were selected according to the opinion of the participants (usually in a private room in one of the counselling cen-

tres mentioned above). The duration of the interview was between 35 and 80 minutes (average of 50 minutes), and all interviews were recorded. After transcribing 12 interviews, Maxqda10 Software (Udo Kuckartz, Berlin, Germany) was used to manage and organise the obtained data. For data analysis, directed content analysis method was used. First, the interviews were read word by word, line by line, and paragraph by paragraph several times in order to obtain the general understanding. Then, the meaning units and initial codes were extracted, and similar codes were classified as sub-categories. The related sub-categories formed categories, and the related categories formed the themes.

Rigor of qualitative data in the field work phase

To ensure the trustworthiness of qualitative data, the Lincoln and Guba criteria, including credibility, confirmability, dependability, and transferability, were used [13]. Member check (rechecking the meanings and codes of the interview with the participant) and peer check and external check (rechecking the meanings and codes of the interview with research colleagues as well as the four faculty members qualified in the qualitative research and research subject) prolonged engagement with the data gathering and analysing (allocating a lot of time to review and modify the codes several times), maximum variation during sampling, writing all

Table 1. An overview of some of studies conducted on the concept of health-related lifestyle in people living with HIV

Author (year)	Country	Study design	Study subject	Sample/sample size	Data collection
Orban (2010)	USA	Cross-sectional	Coping strategies	166 adolescents with HIV/AIDS	Questionnaire
Dessie (2012)	Africa	Qualitative	Sexual activities	13 PLWHA	Interview
Amoran (2012)	Nigeria	Cross-sectional	Risky sexual behaviours	637 PLWHA	Questionnaire
Saumoy (2016)	Spain	Clinical trial	The impact of multidimensional lifestyle on cardiovascular risk factors	54 PLWHA	Questionnaire and laboratory tests
Melchior (2007)	Brazil	Qualitative	ART adherence challenges	34 PLWHA	Interview
Nedjat (2015)	Iran	Mixed method	Sexuality needs and fertility health	40 and 400 PLWHA in qualitative and quantitative study	Interview and questionnaire
Nalugo (2015)	Uganda	Cross-sectional	Lifestyle factors and fertility health	614 adolescents with HIV/AIDS through the prenatal	Questionnaire
Uphold (2007)	USA	Cross-sectional	Healthy lifestyle and QoL	226 males with HIV/AIDS	Questionnaire
Magidson (2015)	USA	Longitudinal	Structure of daily activities	199 PLWHA	Questionnaire and electronic monitoring
Jorjani (2014)	Iran	Cross-sectional	Disclosure and its related factors	175 PLWHA	Questionnaire
Wang (2015)	China	Cross-sectional	Changes in the use of cigarettes after disease	2973 PLWHA	Questionnaire
Lee (2001)	USA	Cross-sectional	Effect of sleep and activity pattern on fatigue	100 females with HIV/AIDS	Questionnaire and electronic monitoring
Plach (2005)	USA	Qualitative	Self-care activities	9 women \geq 50 years, old with HIV/AIDS	Interview
Ramirez (2004)	Puerto Rico	Cross-sectional	Physical activity, leisure time, life satisfaction	67 PLWHA	Questionnaire
Radfar (2014)	Iran	Qualitative	Effective behaviours on the transmission	64 PLWHA	Focus group interview
Moralejo (2006)	Spain	Cross-sectional	Art adherence	143 PLWHA	Questionnaire
Philogen (2014)	Haiti	Mixed method	Complementary and alternative medicine (CAM)	680 PLWHA	Questionnaire and interview
Abachi (2014)	Iran	Phenomenology	Stigma and QOL	6 PLWHA	Interview
Sowel (1997)	USA	Qualitative	Self-care activities	27 females with HIV/AIDS	Focus group interview
Krishnan (2007)	India	Qualitative	Sexual activities	30 PLWHA	Interview
Sanders (2009)	USA	Qualitative	Women sexual behaviours and functions about pregnancy	9 mothers with HIV/AIDS	Interview
Rahmati (2009)	Iran	Qualitative	Risky behaviours	61 PLWHA	Interview

the research steps explicitly so that other researchers would also be able to track the data, recording participants' statements, and a detailed description of the field and the participants were used to ensure the scientific accuracy and validity of the data collected at this stage.

Final analytical phase

In this phase, the codes and categories obtained from the field work phase were compared with the data obtained from the literature review in the theoretical phase, and final-

Table 2. Demographic characteristics of the participants in the field work phase

Participant	Gender	Age	Marital status	Having children	Education	Duration of disease	Disease situation	Transmission mode
1	Male	37 y	Single	–	Middle school	3 y	AIDS	Jointly used needle syringe
2	Male	28 y	Married	1 child	Diploma	7 y	HIV	Jointly used needle
3	Male	39 y	Single	–	Bachelor	2 y	HIV	Sex (homosexual)
4	Male	48 y	Single	–	Diploma	4 y	HIV	Sex
5	Male	33 y	Single	–	Diploma	4 m	HIV	Sex
6	Male	37 y	Married	No children	Diploma	10 y	AIDS	Jointly used needle
7	Male	25 y	Single	–	Diploma	3 y	HIV	Sex
8	Female	40 y	Married	2 children	Bachelor	2 y	HIV	Unknown
9	Female	32 y	Married	1 child	Diploma	2 y	HIV	Unknown
10	Female	33 y	Married	No children	Diploma	2 y	HIV	Probably dentistry
11	Female	38 y	Married	1 child	Middle school	5 y	HIV	Tattoos
12	Female	38 y	Single	–	Bachelor	8 y	HIV	Probably dentistry

ly the common features of HRL in HIV/AIDS patients were identified and the definition of the concept was presented.

Ethical considerations

Permission for this study was obtained from the Ethics Committee of Iran University of Medical Sciences (ethical approval number IR.IUMS.FMD.REC.1395.9221199206). Oral and written informed consent was received from the participants. The participants were allowed to leave the study at any time. All participants were assured that interviews would be completely confidential and that the results would be reported anonymously.

Results

Theoretical phase

In this section, the findings from the literature review are discussed in three parts: attributes, antecedents, and consequences.

Attributes

In the literature review, five main attributes were extracted (a total of 138 codes, 23 subcategories, 10 categories, and five main categories), which are referred to in the following:

1. Physical health behaviours: this category, which includes nutrition habits, physical activity, and sleep patterns, reflects the behaviours that people display in their daily lives in relation to their physical health. In a review of the literature, PLWHA compliance with the correct food pattern (healthy, fresh, and varied diet), having proper physical activity, particularly regular exercise, and improving sleep quality will help them to improve their health [14-17].

2. Social and recreational activities: interpersonal relationships and economic and social wellbeing are two important parts of this category. In general, the relationships that PLWHA have with their spouse/partner, family, friends, health professionals/health care providers, and the community, as well as disclosure or concealment of these people, are the main themes of interpersonal relationships. Socioeconomic prosperity includes issues related to individuals' occupational and recreational activities [18]. Unemployment, which mainly results from stigma and physical loss, can lead to loss of income and reduced welfare.

3. Sexuality and fertility health: sexual desire and activity [19, 20], giving information about sexual relations [21], sexual risk behaviours (non-use of a condom, having more than one partner, sexual relations with sex workers, unprotected anal sex, concurrent sexual relations, having IV drug-abusing partners, and lack of knowledge about partner's status) [21-26], attention to reproductive health (using family planning methods, pregnancy experience after diagnosis, and receiving prenatal care) [19, 21, 27], and screening (performing pap smear and sexually transmitted disease testing) are the most important behaviours in this category of HRL mentioned in the literature review [18, 19].

4. Health-centred care: treatment adherence and self-care constitute two main dimensions of this category. Treatment adherence, which includes the strict implementation of the drug program and the ongoing follow-up of the disease (regular visits to the doctor and seeking medical care) in the review of the literature is an important part of PLWHA's lifestyle and is affected by a variety of factors [14, 28-31]. Self-care refers to activities that individuals carry out through their own abilities and resources aimed at promoting health and preventing dis-

ease severity, including information about the disease, avoiding high-risk health behaviours (smoking, drug abuse, alcohol abuse), and the use of complementary and alternative medicine (CAM) [32-34].

- 5. Distress and coping:** the last category of attributes of the concept of HRL in PLWHA, which was found in the literature review, was distress and coping. The stresses that individuals face due to the disease (psychosocial stress and treatment-related stress) and coping with those stresses are the main themes of this category. People with HIV/AIDS are exposed to various stresses [35, 36], and they use adaptive and maladaptive strategies to manage these stresses [37-41].

Antecedents

Health-related lifestyle antecedents referred to in the literature review can be divided into five categories:

- 1. Demographic factors:** these factors include age, sex, education, place of residence, economic status, and occupational status. For example, age is among the antecedents influencing art adherence [31, 42], drug dependence [43], smoking [44], use of condoms in sexual relationships [26], and disclosure of illness [45].
- 2. Psychosocial factors:** stigma, discrimination within the family, social, and health care settings, psychological disorders such as anxiety and depression, fear, social support, functional support, and moral responsibility are among factors that fall into this category. Stigma can be considered as the most important predictor, referred to in various texts, which influences on behaviours such as decrease of ART adherence [28, 39], reduction of interpersonal relationships [29, 46], non-use of condoms [47], non-disclosure of disease [39, 48-50], suicidal ideation and action [49], and unprotected sex [51].
- 3. Clinical antecedents:** modes of transmission, disease stage, number of symptoms, CD4 count, viral load, and the presence of symptoms such as pain and fatigue are antecedents that affect the HRL in PLWHA.
- 4. Health care system factors:** the quality and quantity of physician-patient communication and antiretroviral drug-use factors can be found in this class of antecedents. A good relationship between physician and patient increases ART adherence [52], while difficult access to a doctor reduces it [53]. Drug-related factors also include the experience of side effects of medications [28, 47] or the concern about their experience [36, 53], intolerance, or drug tiredness [28, 53], difficult process of providing drug, and lack of trust in the medication [53].
- 5. Factors related to knowledge and attitude:** lack of education and incorrect mental beliefs are the two main factors that fall into this category of antecedents. For example, in women with HIV/AIDS who did not have a Pap smear, lack of instruction by health care personnel and no obligation to perform this test because of difficulty were the two main reasons [54].

Consequences

As mentioned in the literature, the most important consequence of a healthy lifestyle is enhanced physical and mental health. Adopting a healthy lifestyle improves neurocognitive function, life quality, and satisfaction, and ultimately improves the physical and mental health of affected individuals [14, 15, 34].

Working definition

HRL in PLWHA is a set of behaviours affected by various personal and social factors aimed at providing physical and mental health, including addressing physical health, health-centred care, sexuality and reproductive health, social and recreational activities, and stress management.

Field work phase

Six categories related to the concept of HRL were determined during interviews (Table 3), including:

- **Physical health:** eating habits, physical activity, and sleep are the three main parts of this category of lifestyle behaviours. A number of participants stated that they had been trying to improve their nutritional status and ultimately their physical health with healthy and diverse foods since they were infected: *"I eat less sweets, but I always have my diary and milk. I try to eat every kind of food. I try to have every type of food such as proteins in my diet based on my medications"*. (p3)

Nightmares caused by ART were among the most important problems affecting sleep quality of participants: *"At first when I took my medicines, I had nightmares as I was falling from somewhere or they were taking me to jail, I had horrible nightmares"*. (p5)

Physical weakness and loss of physical strength were problems that reduced the individuals' physical activity. In this regard, a participant reported: *"I feel my body is debilitating, I'm not as strong as before, I feel like resting more"*. (p6)

- **Social interactions:** in relation to this category, one of the most important challenges that participants are faced with is the fear of exposing the disease and others' reaction to their disease, so that in some cases they went to another city or place to receive care in spite of the presence of health care services in their place of residence. In this regard, participant 4 stated: *"In my family, only my brother knows it, I could tell no one then I wouldn't take my files from health care centre in county and come here to spend this much. No one can understand it"*.

Most participants expressed a number of instances in which they were treated in a discriminatory way in medication areas, or were even refused services: *"Once I had a problem with my tooth and I went to two dentists, but they didn't accept me, at last I had to tell nothing in the third place to have my tooth treated"*. (p2)

Another participant reported: *"Some time ago I had an accident, my uncle told the hospital staff about my dis-*

Table 3. Attributes extracted from fieldwork phase

Main categories/Categories/Subcategories
Physical health
Nutritional habits
Eating level
Diversity of food
Choose a healthy diet
Sleep status
Sleep quality
Sleep schedule
Physical activity
Physical power
Physical activity level
Social interactions
Disclosure of disease
Disclosure to important people of life
Disclosure to social and therapeutic centres
Facing the challenges of disclosure
Social support
Interruptions in interpersonal relationships
Relations with peers
Being accepted
General acceptance
Acceptance by health care services
Entertainment and welfare
Recreational activities
Physical-recreational activity
Self-entertainment
Communicating with others
Financial problems
Job instability
Financial burden of disease

ease so that they can provide better care.... They didn't even visit me until 2 a.m., they didn't even touch me". (p11)

- **Entertainment and welfare:** the most important problem PLWHA are faced with in this area is economic problems. Reduced physical activity, avoidance of employers from employing affected people, and inappropriate co-workers' behaviours were among the most important issues that participants reported: "*In the past, I had power of two healthy men, I could work but now I can't. This disease crippled me somehow ... then again if others know that they would not accept to work with me*". (p1)
- **Sexuality and fertility health:** the main themes of this category are marriage, sexual relations, and childbearing. Constraints on establishing a family are another social consequence of the disease that were reported by

Table 3. Cont.

Main categories/Categories/Subcategories
Sexuality and fertility health
Sexual activity
Risky sexual behaviours
Qualitative and quantitative sexual dysfunction
Stressful marriage
Unstable marriage
Marriage rearrangement
Childbearing
Concerning about reproduction
Getting advice
Health-centred care
Art adherence
Proper implementation of ART program
ART adherence challenges
Self-care
Continuous follow-up
Preventive measures
Seeking information
Health-related risk behaviours
Using complementary and alternative medicine
Distress and coping
Stress management
Adaptive coping
Maladaptive coping
Reaction to limitations
Fear of disease transmission
Feeling of being limited

the majority of patients, especially those who were not married: "*I thought there are some people like me who may intend to marry, but each person I dated told me that you yourself are sick. That's why I'm disappointed*". (p1)

Regarding sexual activity, one of the participants stated: "*My sexual relationship became less frequent, I always hated condoms, I'm not comfortable with it at all, I'm tolerating somehow...*". (p11)

Most married patients who did not have a child and even some single patients reported one of their concerns was having a child: "*I myself am much interested in having a baby but my husband doesn't accept it, early in my marriage I become pregnant but he took the official letter for getting an abortion, so I aborted my child*". (p10)

- **Health-centred care:** adherence to ART and self-care constitute the main dimensions of this category of attributes. Regarding familiarity with drugs and their timely use, a participant stated: "*I don't still know my medicine,*

I don't every take them on time, whenever I go to a party or somewhere, I took my mom's pills box and put them in it". (p11)

A number of participants also said that they have become more sensitive to health since they were infected: *"When something is harmful for me I don't consume it, if someone has cold I would not accept to drink water with his/her glass at all". (p6)*

- **Distress and coping:** the strategies used by individuals to adapt to the disease constitute the main theme of this category. A number of people used positive methods (adaptive coping) and a number of negative methods (maladaptive coping) in adapting to the disease. In this regard, participant 9 stated: *"At first I was deeply depressed, but little by little I get to know my disease, my husband helped me a lot, my family helped me a lot, they tried to keep me happy, I talked with god a lot, I was going to holy places every week".*

Discussion

In this study, the concept of HRL in clinical nurses was investigated using a hybrid concept analysis approach by integrating the findings of theoretical and fieldwork phases. The results showed that health-related lifestyle is a complex and multidimensional pattern of a set of behaviours that PLWHA display in their daily lives to reduce their disease-related harm and increase their health. In the current study, six attributes were extracted as follows:

One of the extracted attributes was "addressing physical health", which includes dietary habits, sleep status, and physical activity. The findings of this study showed that most participants experienced problems such as lack of exercise and weight loss, physical weakness and loss of physical strength, and reduced sleep quality. These people believed that HIV/AIDS had a negative impact on their physical condition, and because they were more susceptible to disease than ordinary people, they tried to follow a healthy diet, have enough rest, and do activities such as walking regularly to improve their physical health; in other words, they believed that the disease caused them to carefully monitor their physical condition and choose a healthier lifestyle. This was so serious that, according to some, they were somehow obsessed with their physical health.

The second attribute was "social interactions". In addition to living with chronic and threatening AIDS, patients face numerous challenges in their personal relationships with family, friends, colleagues, and even health care providers [55], and the everyday experience of social labelling and social exclusion is from the life experience of these people [18]. One of the most important challenges participants were faced with in social interactions was the fear of exposing the disease and the reactions of others to the disease. The importance of this issue is so high that some of the participants did not disclose their illness to any of their family members and, in some cases, they had migrated from their place of living due to the fear of disclosure and rejection.

However, families are the most important source of personal care during illness in many developing countries. AIDS has challenged this issue in many cases, and people with disabilities have been excluded from their families [56]. In other words, an individual with HIV/AIDS always finds himself/herself in a tense state of concealment and disclosure for help, and this disruptive situation deprives him/her of the role of a patient who could receive others' attention and empathy [46]. In the study by Esmaelzadeh *et al.*, fear of being rejected by family and partner, as well as stigma and discrimination in the community, were factors that influenced the disclosure of the disease [57].

The social relationships of PLWHA are affected at different levels and with different dimensions and intensity. Many participants severely restricted their social circle, and in some cases they isolated themselves. In a study by Zhang *et al.*, half of the people reported that the disease had influenced their individual relationships with relatives or friends [58]. In a study by Lekganyane *et al.*, PLWHA also isolated themselves and took on hidden strategies [59].

In the field of social interactions, another issue that participants report is the need for community acceptance, particularly in health care systems. Many people complained about the inappropriate and discriminatory behaviour of health care providers and had even been refused by them. In the study by Tavakol and Nikain, most patients expressed annoyance and discomfort due to discriminatory treatment from physicians and unequal access to health care services [60].

The third feature of the concept of HRL in PLWHA is the issue of "entertainment and welfare" for these people. Job destabilisation due to reduced physical capacity, employers' refusal to employ them, and inappropriate co-worker encounters, and thus economic problems, were the most important concerns that participants in this area are faced with. Despite the fact that the HIV virus cannot be transmitted in most work environments or in normal working relationships, assuming the risk of transmission has led many employers to avoid employing sick people or to dismiss them. In most workplaces, affected people also encounter labels, insults, and exclusion from their colleagues [61]. In a study by Kabbash *et al.*, PLWHA reported changes in their job status, inability to perform the job and similar activities the same as before being inflicted with the disease, lack of job opportunities, and lack of opportunities for recreational activities. Most patients had financial problems and feared that they would not have enough nutrition and care in the future [62].

"Sexuality and fertility health" was the fourth attribute derived from theoretical and field work data. In this study, sexual activity, married life, and reproduction of PLWHA were affected by the disease. Most participants reported decreased sexual intercourse or discomfort with condom use. In the study by Behboodi-Moghadam *et al.*, HIV/AIDS also affected the physical ability for sexual intercourse, attitudes towards sex, and the quality of sex [63]. Another problem for the participants was the marriage issue. A number of them suggested that the disease is a major obstacle to their marriage. This issue was also reported in Fallahi's study [49].

The fifth attribute was “health-centred care”. Adherence to ART was the most important aspect of this category of attributes. Although most participants stated that they were taking their medicines in a timely manner, almost all of them experienced adverse drug reactions and reported these side effects as well as the fact that the use of these drugs for their whole life was exhausting and debilitating. Drug use, even if it has no side effects, is reminiscent of the fact that the person is ill, and this can be regarded as a source of stress for the individual [49]. In a study by Li *et al.*, a number of participants introduced drug tiredness or avoidance of drug side effects due to ART non-adherence [53]. PLWHA used strategies such as smoking cessation, drugs, and alcohol, giving information about the disease, and continuous follow-up to reduce the health effects of illness. In a study by Plach *et al.* and Sowel *et al.*, PLWHA used some strategies to improve their physical and mental state [38, 40].

The last attribute was “distress and coping”. Yang *et al.* argue that the main problem for HIV/AIDS patients is psychosocial problems, and the factors that are associated with this problem include adjustment in relation to occupation and profession, and economic, cultural, and psychological status [64]. In the present study, all participants experienced anxiety, misery, depression, disappointment, anger, and feelings of disability and incapability, and most of them experienced suicidal tendencies. These patients use adaptive strategies (such as trusting in God, changing attitudes toward disease and positive thinking, and referring to a psychologist) and maladaptive strategies (such as self-blaming, crying, silence, isolation, self-mutilation, and suicide) to adapt to the disease. Radzniwan *et al.* reported prevalence of depression, anxiety, and stress in their study of 36.9%, 45.1%, and 26.7%, respectively [65].

Conclusions

By applying the hybrid model, we analysed the concept of HRL of PLWHA in Iran, because no studies on this topic had been conducted in the past. In conclusion, according to the results of the theoretical and fieldwork phases of this study, HRL from the perspective of PLWHA is a set of behaviours that have different physio-psycho-social dimensions that people display in their individual and social lives, thereby providing their physical and mental health and adapting to the problems associated with the disease. In this regard, they are faced with many challenges.

The results of this study can lead to a clear definition of the concept of HRL in PLWHA based on the social and cultural characteristics of Iranian community and development of a valid and reliable tool for measuring the health-related lifestyle in these individuals, which can be applied by doctors, nurses, and sociologists. It is also possible to compare the tools of this study with existing lifestyle tools to reveal differences between the general tools in normal lifestyle and the specific tools employed by people living with HIV/AIDS.

Limitations

One limitation of this study was the lack of access to the full text copies of some papers. In addition, access to all resources via an electronic database was not possible. Another limitation was the language barrier and the use of literature just in English and Persian languages. Although in the hybrid concept development, the aim of the fieldwork phase is to empirically elucidate and explore the concept not its empirical generalisation, HRL in PLWHA is a context-based concept that needs to be studied from the perspectives of diverse cultures and contexts in order to provide a comprehensive definition.

Acknowledgments

This paper is a report of the qualitative part of a mixed method study conducted in Iran University of Medical Sciences for a nursing PhD degree. The authors would like to acknowledge all those who cooperated in the research project, especially the PLWHA, who kindly participated in the interviews and stated their valuable perceptions. This research was supported by the School of Nursing and Midwifery affiliated with Iran University of Medical Sciences.

Conflict of interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

1. Baryamutum R, Baingana F. Sexual, reproductive health needs and rights of young people with perinatally acquired HIV in Uganda. *Afr Health Sci* 2011; 11: 211-218.
2. Global HIV & AIDS statistics – 2018 fact sheet. UNAIDS, 2018. Available at: www.unaids.org/en/resources/fact-sheet.
3. Smeltzer S, Bare B, Hinkle J, Cheever K. Brunner and Suddarth's Textbook of Medical-Surgical Nursing. Lippincott Williams & Wilkins, Philadelphia 2013.
4. Monahan FD, et al. Phipps' medical-surgical nursing: health and illness perspectives. Elsevier Mosby, 2007.
5. Gnardellis C, Tzamalouka G, Papadakaki M, et al. An investigation of the effect of sleepiness, drowsy driving, and lifestyle on vehicle crashes. *Transportation research part F* 2008; 11: 270-281.
6. Kožuchová M, Bašková M. Selected factors of lifestyle in relation to overweight in population of school-aged youth. *Kontakt* 2015; 17: e142-e146.
7. Moer M. Evidence of the effectiveness of intervention for secondary prevention and treatment of coronary heart. Dissertation, 2002.
8. Naghibi F, Golmakani N, Esmaily H, Moharari F. The relationship between life style and the health related quality of life among the girl students of high schools in Mashhad, 2012-2013. *Iranian Journal of Obstetrics, Gynecology and Infertility* 2013; 16: 9-19.
9. He K, Kramer E, Houser RF, et al. Defining and understanding healthy lifestyles choices for adolescents. *J Adolesc Health* 2004; 35: 26-33.
10. Lyons RF. Health lifestyle: out of style. *Shift* 2000; 3: 4.
11. Rafii F, Sajadi Hezaveh M, Seyed Fatemi N, Rezaei M. Concept Analysis of Social Support of New Graduate Nurses in the workplace: A Hybrid Model. *Iran Journal of Nursing* 2014; 26: 71-89.

12. Grant MJ, Booth A. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Info Libr J* 2009; 26: 91-108.
13. Speziale HS, Streubert HJ, Carpenter DR. *Qualitative research in nursing: Advancing the humanistic imperative*. Lippincott Williams & Wilkins, 2011.
14. Fazeli PL, Woods SP, Heaton RK, et al. An active lifestyle is associated with better neurocognitive functioning in adults living with HIV infection. *J Neurovirol* 2014; 20: 233-242.
15. Saumoy M, Alonso-Villaverde C, Navarro A, et al. Randomized trial of a multidisciplinary lifestyle intervention in HIV-infected patients with moderate-high cardiovascular risk. *Atherosclerosis* 2016; 246: 301-308.
16. Lal LS, Grimes RM, Swint JM, Risser J. A retrospective study to determine the impact of medical-and lifestyle-based contraindications to a prescribed HAART regimen on clinical outcomes and adherence. *J Clin Pharm Ther* 2006; 31: 429-439.
17. Ramirez-Marrero FA, Smith BA, Meléndez-Brau N, et al. Physical and leisure activity, body composition, and life satisfaction in HIV-positive Hispanics in Puerto Rico. *J Assoc Nurses AIDS Care* 2004; 15: 68-77.
18. Behravan H, Noghani M, Abachi A. Study the process of labeling for HIV patients (AIDS) and its implications (case study). *Journal of Sociology of Iran* 2011; 12: 1-16.
19. Nedjat S, Moazen B, Rezaei F, et al. Sexual and reproductive health needs of HIV-positive people in Tehran, Iran: a mixed-method descriptive study. *Int J Health Policy Manag* 2015; 4: 591-598.
20. Dessie Y, Deresa M. Sexual practices of HIV-positive individuals attending antiretroviral treatment (ART) in Addis Ababa public hospitals: findings from in-depth interview. *Pan Afr Med J* 2012; 13: 80.
21. Ezeanolue EE, Wodi AP, Patel R, et al. Sexual behaviors and procreational intentions of adolescents and young adults with perinatally acquired human immunodeficiency virus infection: experience of an urban tertiary center. *J Adolesc Health* 2006; 38: 719-725.
22. Pearson CR, Cassels S, Kurth AE, et al. Change in sexual activity 12 months after ART initiation among HIV-positive Mozambicans. *AIDS Behav* 2011; 15: 778-787.
23. Bateganya M, Colfax G, Shafer LA, et al. Antiretroviral therapy and sexual behavior: a comparative study between antiretroviral-naïve and-experienced patients at an urban HIV/AIDS care and research center in Kampala, Uganda. *AIDS Patient Care STDS* 2005; 19: 760-768.
24. Johnson P. *Risky health behaviors and neurocognitive function among people living with HIV*. University of Southern California, 2009.
25. Halkitis PN, Parsons JT, Wilton L. Barebacking among gay and bisexual men in New York City: explanations for the emergence of intentional unsafe behavior. *Arch Sex Behav* 2003; 32: 351-357.
26. Amoran O, Ladi-Akinyemi T. Sexual risk history and condom use among people living with HIV/AIDS in Ogun State, Nigeria. *J Sex Med* 2012; 9: 997-1004.
27. Sanders LB. Sexual behaviors and practices of women living with HIV in relation to pregnancy. *J Assoc Nurs AIDS Care* 2009; 20: 62-68.
28. Melchior R, Nemes MI, Alencar TM, Buchalla CM. Challenges of treatment adherence by people living with HIV/AIDS in Brazil. *Rev Saude Publica* 2007; 41 Suppl 2: 87-93.
29. Olalekan AW, Akintunde AR, Olatunji MV. Perception of societal stigma and discrimination towards people living with HIV/AIDS in Lagos, Nigeria: a qualitative study. *Mater Sociomed* 2014; 26: 191-194.
30. Mbalinda SN, Kiwanuka N, Kaye DK, Eriksson LE. Reproductive health and lifestyle factors associated with health-related quality of life among perinatally HIV-infected adolescents in Uganda. *Health Qual Life Outcomes* 2015; 13: 170.
31. Tufano CS, Amaral RA, Cardoso LR, Malbergier A, et al. The influence of depressive symptoms and substance use on adherence to antiretroviral therapy. A cross-sectional prevalence study. *Sao Paulo Med J* 2015; 133: 179-186.
32. Gaede BM, Majeke SJ, Modeste RR, et al. Social support and health behaviour in women living with HIV in KwaZulu-Natal. *SAHARA J* 2006; 3: 362-368.
33. Littlewood RA. *Using 'common-sense' to understand complementary and alternative medicine use and HAART adherence in HIV+ people*. Syracuse University, 2009.
34. Duggan J, Peterson WS, Schutz M, et al. Use of complementary and alternative therapies in HIV-infected patients. *AIDS Patient Care STDS* 2001; 15: 159-167.
35. Uphold CR, Holmes W, Reid K, et al. Healthy lifestyles and health-related quality of life among men living with HIV infection. *J Assoc Nurses AIDS Care* 2007; 18: 54-66.
36. Orban LA, Stein R, Koenig LJ, et al. Coping strategies of adolescents living with HIV: disease-specific stressors and responses. *AIDS Care* 2010; 22: 420-430.
37. Mahmoudi M, Dehdari T, Shojaezadeh D, Abbasian L. Coping with stress strategies in HIV-infected Iranian patients. *J Assoc Nurses AIDS Care* 2015; 26: 464-471.
38. Sowell RL, Moneyham L, Guillory J, et al. Self-care activities of women infected with human immunodeficiency virus. *Holist Nurs Pract* 1997; 11: 18-26.
39. Vanable PA, Carey MP, Blair DC, Littlewood RA. Impact of HIV-related stigma on health behaviors and psychological adjustment among HIV-positive men and women. *AIDS Behav* 2006; 10: 473-482.
40. Plach SK, Stevens PE, Keigher S. Self-care of women growing older with HIV and/or AIDS. *West J Nurs Res* 2005; 27: 534-553.
41. Adedimeji AA, Alawode OO, Odutolu O. Impact of Care and Social Support on Wellbeing among people living with HIV/AIDS in Nigeria. *Iran J Public Health* 2010; 39: 30-38.
42. Salami AK, Fadeyi A, Ogunmodede JA, Desalu O. Factors influencing adherence to antiretroviral medication in Ilorin, Nigeria. *J Int Assoc Physicians AIDS Care (Chic)* 2010; 9: 191-195.
43. Bing EG, Burnam MA, Longshore D, et al. Psychiatric disorders and drug use among human immunodeficiency virus-infected adults in the United States. *Arch Gen Psychiatry* 2001; 58: 721-728.
44. Wang Y, Chen X, Li X et al. Cigarette smoking among Chinese PLWHA: An exploration of changes in smoking after being tested HIV positive. *AIDS Care* 2016; 28: 365-369.
45. Adeniyi OV, Ajayi AI, Selanto-Chairman N, et al. Demographic, clinical and behavioural determinants of HIV serostatus non-disclosure to sex partners among HIV-infected pregnant women in the eastern cape, South Africa. *PLoS One* 2017; 12: e0181730.
46. Parvin S, Eslamian A. The lived experience of women living with HIV in social relationships. *Jurnal Women in Development and Politics* 2014; 12: 207-228.
47. Sri Krishnan AK, Hendriksen E, Vallabhaneni S, et al. Sexual behaviors of individuals with HIV living in South India: a qualitative study. *AIDS Educ Prev* 2007; 19: 334-345.
48. Philogene J. *Patterns of HIV serostatus disclosure among HIV-positive young adults in Haiti: A mixed methods investigation*. Master's thesis, Duke University. Available at: <http://hdl.handle.net/10161/8862>. 2014.
49. Fallahi F, Tavafian S, Yaghmaie F, Hajizadeh E. Consequences of living with hiv/aids: A qualitative study. *Journal of the Iranian Institute for Health Sciences Research (Payesh)* 2013; 12: 243-253.
50. Abachi A, Behravan H. The Analysis of Stigma Impact on Quality of Life in Patients with HIV/AIDS: A Phenomenological Study. *J Qual Res Health Sci* 2013; 2: 158-172.
51. Peltzer K, Ramlagan S. Safer sexual behaviours after 1 year of antiretroviral treatment in KwaZulu-Natal, South Africa: a prospective cohort study. *Sexual Health* 2010; 7: 135-141.
52. van Servellen G, Lombardi E. Supportive relationships and medication adherence in HIV-infected, low-income Latinos. *West J Nurs Res* 2005; 27: 1023-1039.

53. Li L, Lee SJ, Wen Y, et al. Antiretroviral therapy adherence among patients living with HIV/AIDS in Thailand. *Nurs Health Sci* 2010; 12: 212-220.
54. Radfar SR, Sedaghat A, Banihashemi AT, et al. Behaviors influencing human immunodeficiency virus transmission in the context of positive prevention among people living with HIV/acquired immunodeficiency syndrome in Iran: a qualitative study. *Int J Prev Med* 2014; 5: 976-983.
55. Kalichman SC. *Understanding AIDS: Advances in research and treatment*. American Psychological Association, 1998.
56. McGrath JW, Ankrah EM, Schumann DA, et al. AIDS and the urban family: its impact in Kampala, Uganda. *AIDS Care* 1993; 5: 55-70.
57. Esmaelzadeh Saeieh S, Ebadi A, Mahmoodi Z, et al. Barriers to disclosure of disease in HIV-infected women: a qualitative study. *HIV AIDS Rev* 2018; 17: 12-17.
58. Zhang Y, Zhang X, Aleong TH, et al. Impact of HIV/AIDS on social relationships in rural China. *Open AIDS J* 2011; 5: 67-73.
59. Lekganyane R, du Plessis G. Dealing with HIV-related stigma: a qualitative study of women outpatients from the Chris Hani Baragwanath Hospital. *J Assoc Nurses AIDS Care* 2012; 23: 155-162.
60. Tavakol M, Nikaeen D. The stigmatization of patient physician relationship and treatment in patients with HIV/AIDS. *Biological Ethics Quarterly* 2012; 2: 11-43.
61. Gostin LO. The AIDS litigation project: a national review of court and human rights commission decisions, Part II: Discrimination. *JAMA* 1990; 263: 2086-2093.
62. Kabbash IA, El-Gueneidy M, Sharaf AY, et al. Needs assessment and coping strategies of persons infected with HIV in Egypt. *Eastern Mediterranean Health Journal* 2008; 14: 1308-1320.
63. Behboodi-Moghadam Z, Esmaelzadeh-Saeieh S, Ebadi A, et al. Development and psychometric evaluation of a reproductive health assessment scale for HIV-positive women. *Shiraz E Medical Journal* 2016; 17: e38489.
64. Yang MH, Chen YM, Kuo BI, Wang KY. Quality of life and related factors for people living with HIV/AIDS in Northern Taiwan. *J Nurs Res* 2003; 11: 217-226.
65. Radzniwan R, Alyani M, Aida J, et al. Psychological status and its clinical determinants among people living with HIV/AIDS (PLWHA) in Northern Peninsular Malaysia. *HIV AIDS Rev* 2016; 15: 141-146.