Psychology Research and Behavior Management Dovepress

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Intrinsic Association Between Death Anxiety and Depression Among Men Living with HIV/AIDS in China: A Network Analysis

Chengbin Zheng[1], Leilei Liang[1], Marhaba Kiyum[1], Tongshuang Yuan[1], Junsong Fei[1], Huimin Wang[1], Jiaying Gao[1], Xiaoying Liu[1], Songli Mei[1], Na Du[2]

[1]Department of Social Medicine and Health Management, School of Public Health of Jilin University, Changchun, 130021, People's Republic of China; [2]Center of Infectious Disease and Pathogen Biology, Department of Infectious Diseases, The First Hospital of Jilin University, Changchun, 130061, People's Republic of China

Correspondence: Songli Mei, Jilin University, Department of Social Medicine and Health Management, School of Public Health of Jilin University, Changchun, 130021, People's Republic of China, Email meisongli@sina.com; Na Du, The First Hospital of Jilin University, Center of Infectious Disease and Pathogen Biology, Department of Infectious Diseases, The First Hospital of Jilin University, Changchun, 130061, People's Republic of China, Email du_na@jlu.edu.cn

Background: With the increasing popularity of ARVs, physical symptoms of people living with HIV/AIDS (PLWHA) have been effectively improved. Improving mental health and quality of life has gradually become the focus of attention in the treatment. The aim of this study is to explore the association between death anxiety and depression in men living with HIV/AIDS (MLWHA) from the perspective of network analysis.

Methods: This study recruited 701 MLWHA in Jilin Province, China. Participants were asked to complete a questionnaire. The average age of the participants was 37.4 years old. Among them, there were 54 heterosexual participants, 494 homosexual participants, 139 bisexual participants, and 14 asexual/other participants. Network analysis was used to identify central symptoms, key bridge symptoms, and the strongest edge among symptoms in the death anxiety and depression network.

Results: In this study, 18.1% of MLWHA may suffer from severe depression. The severity of depression in homosexual MLWHA was severer than in heterosexuals. Death anxiety was severer among unmarried and married/cohabiting MLWHA compared to divorced/separated/widowed MLWHA. This study found that item DAS10 (The topic of post death is very confusing to me) was the most central symptom. The edge DAS2 – PHQ9 (Rarely think of death – Suicide ideation) was the strongest edge between death anxiety and depression. Item DAS2 (Rarely think of death) was the strongest bridge symptom.

Conclusion: Psychological symptoms such as distress over the topic of death, thoughts of death, and suicidal ideation play an important influential and connecting role in the death anxiety-depression network among MLWHA. Implementing appropriate interventions for these symptoms—such as popularizing correct knowledge of death and providing more psychological counseling services for this group—can effectively reduce the co-occurrence of death anxiety and depression, thereby improving the mental health of MLWHA.

Keywords: death anxiety, depression, men living with HIV/AIDS, network analysis, comorbid psychological symptoms

Introduction

HIV/AIDS is one of the major infectious diseases and a serious public health challenge in the globe. By 2022, there were 1.223 million PLWHA in China. Among them, 107,000 were new diagnoses in 2022. Of the newly diagnosed PLWHA in 2022, MLWHA accounted for about 78.3%.[1] With the increasing availability of ARVs, the life expectancy of PLWHA has been significantly extended. However, how to improve the mental health and quality of life of PLWHA has gradually become a focus of attention from all parties.[2,3] Most previous studies on the mental health of PLWHA have focused on both genders,[4] with relatively fewer studies specifically targeting MLWHA. On the other hand, gay men and other men who have sex with men (MSM) are among the populations most affected by HIV. The median HIV prevalence among

Received: 3 July 2024
Accepted: 21 November 2024
Published: 29 November 2024

gay men and other MSM is 7.7% higher than that of the general adult population.[5] Given this reality and considering the characteristics of the PLWHA population in China, it is necessary to conduct more in-depth research on the psychological symptoms of MLWHA.

The incidence rate of mental disorders is high among PLWHA.[6] At the same time, depression is also one of the most common mental problems of MLWHA. A meta-analysis found that the prevalence of depression in MLWHA ranged from 37.9% to 71.8%.[4] According to the Social Signal Transduction Theory of Depression,[7] stressors like interpersonal and social rejection faced by MLWHA may increase the risk of depression through the molecular process of biological and behavioral change. Depression not only relate to a variety of factors, it also has multiple negative impacts on MLWHA. Depression may lead to a decline in the gonadal function of MLWHA, affecting their normal sexual functions.[8] And a longitudinal study following 15 times also found that more severe depression was associated with higher risk of death among MLWHA. In addition, studies have been found that depression may have an effect on the cortisol level in PLWHA, and lead to the deterioration of immune functions and the acceleration of disease processes.[9] PLWHA with depression often have poor treatment adherence, which may reduce the effectiveness of ARVs on PLWHA. A study has confirmed that PLWHA with depression were 1.7 times more likely to give up on the treatment compared to patients without depression.[10] Compared to non-depressed PLWHA, PLWHA with depression have a higher risk of developing drug abuse and engaging in unsafe sexual behavior, which poses an even greater threat to their health.[11]

Death-induced anxiety and fear caused by HIV is also one of the important factors affecting the quality of life of patients. According to the Terror Management Theory,[12] MLWHA will consciously or unconsciously think about death when they think the disease is life-threatening to raise to various negative emotions like anxiety and fear.[13] Moreover, death anxiety is considered to be one of common psychological sequelae of MLWHA. PLWHA with high levels of death anxiety often adopt avoidance strategies to escape from the thoughts and pain of death, which also separates themselves from important ways to improve their quality of life.[14] In addition, MLWHA may choose to paralyze themselves by engaging in risky behaviors such as drug or alcohol abuse to reduce their fear of death. PLWHA with death anxiety may view their disease symptoms in a maladaptive and catastrophic way, which could cause post-traumatic stress disorder.[15] Moreover, PLWHA may engage in high-risk sexual behavior, which is more likely to cause the spread of AIDS virus.[16] The intense fear and anxiety of death may lead to social withdrawal of PLWHA and avoid establishing new social relationships with others, affecting their normal social activities of PLWHA, which is easy to form a vicious circle.

HIV infection is considered as one of the major diseases that threaten people's health. Death anxiety may be regarded as a concomitant symptom of depression in PLWHA. Death anxiety and depression reveal a positive correlation and they are important co-morbid psychological symptoms.[17,18] Death anxiety, as a cross-diagnostic structure, is often associated with the occurrence of psychological disorders such as depression and compulsive symptoms.[19] In addition, a study of older adults found that severe death anxiety was part of the depressive syndrome.[17] More severe depression is also one of the important predictor variables of death anxiety in MLWHA.[20] There is an interaction between death anxiety and depression. High levels of depression have been found to be one of the important determinants of death anxiety.[21] Furthermore, depression is found to play an important mediating role between fear of illness and death anxiety.[22] On the other hand, some studies have confirmed that death anxiety and health anxiety had significant impacts on depression, and their influences were stronger than sociodemographic factors.[23] PLWHA with death anxiety may experience many phobias and they often exhibit lower self-integrity, all of which may contribute to the development of depression in PLWHA.

In previous psychiatric studies, the standardized total scores of the scales have often been used to reflect the severity of psychological symptoms,[24] while failing to reflect the connections and distinctions within and between symptoms.[25,26] The proposed Network Theory of Mental Disorders made up for the deficiency in this aspect. According to this theory, there are close associations between different symptoms in the psychopathological network, and the strength of these connections varies.[27] Network analysis, corresponding to the Network Theory of Mental Disorders, is a data analysis method that provides a tool for analyzing the complex inherent relationships between different variables. This model conceptualizes mental health issues as a complex system of interactions among symptoms.[28] With the help of visualized graphs, network analysis can provide a more intuitive representation of the internal structure and interrelationships between symptoms.[29] Network analysis is a data-driven and symptom-oriented analysis method that reflects the strength and nature of associations between different symptoms.[30,31] Through network analysis, we can identify central symptoms

(symptoms that are important and have a large impact on the whole network) and bridge symptoms (for the co-initiation of different symptoms to the critical connecting role). Therefore, network analysis is suitable for exploring the network structure between death anxiety and depression, as well as the intrinsic relationships between different symptoms in MLWHA in this study.

The study conducted on the relationship between death anxiety and depression in PLWHA is limited. Also, in the past clinical treatment process, the intervention for death anxiety and depression is lacking the specificity, which may lead to poor treatment effect and higher medical costs. Network analysis, as a new perspective, has still not been applied in the study of the relationship between the two. The present study aims to identify the central symptoms and key bridge symptoms in the death anxiety and depression network of MLWHA through network analysis, which can provide clinical doctors with scientific-based evidence to formulate more effective interventions to reduce the co-occurrence of death anxiety and depression in MLWHA. Furthermore, it aims to improve the mental health and quality of life of MLWHA.

Materials and Methods

Participants and Procedure

This study collected data from April to July 2023 at a voluntary counseling and testing clinic for HIV in Jilin Province, China. In the first approach, investigators introduced the purpose of the survey to MLWHA visiting the clinic and invited them to participate by completing an online questionnaire. In the second approach, volunteers invited MLWHA who have previously visited the hospital to participate in the survey on WeChat (a widely used social media platform in China) and fill out an online survey questionnaire. Participation was based on voluntary consent, allowing participants to withdraw from the study at any time during the questionnaire. To better protect participants' privacy, we concealed key information that could identify their identities. Ultimately, a total of 712 MLWHA participants were recruited for this study, which also obtained electronic informed consent from the participants. This study complied with the Declaration of Helsinki and has been approved by the Ethics Committee of School of Public Health, Jilin University. After excluding questionnaires with short response time and invalid responses, a total of 701 valid questionnaires were finalized for analysis.

Measures

Depression

The Patient Health Questionnaire-9 (PHQ-9)[32] was used to measure depression status of participants. PHQ-9 was developed based on the DSM-4 diagnostic criteria for severe depression, including 9 items. This scale used a 4-point Likert scale, with a total score ranges between 0 and 27. Higher score indicates more severe depression. A score of 20 or higher indicates that the participant may have severe depression. PHQ-9 has been extensively used to assess depressive symptoms across different populations in China.[33,34] In this study, the Cronbach's alpha for the PHQ-9 was 0.91, indicating very good reliability.

Death Anxiety

The Templar's Death Anxiety Scale (T-DAS)[35] was used to measure the death anxiety of MLWHA. T-DAS consisted of 15 questions, example item like "I am very afraid of death". Each question contains two options: "1= yes" and "0= no", with a total score ranges from 0 to 15. There were six items in the scale that use reverse scoring. Higher total score suggests more severe death anxiety of participants. In this study, the Cronbach's alpha for the T-DAS was 0.79, indicating good reliability.

Personal Information

In addition to measuring the participants' death anxiety and depression status, this study also collected some other personal information, including age, residential area, marital status, HIV transmission routes, sexual orientation, and infection period.

Data Analysis

In this study, we first conducted descriptive analysis to outline participants' personally relevant information. Next, t-tests, one-way ANOVA, and post hoc comparison were used to test whether participants' depression scores and death anxiety scores differed significantly between subgroups of personally relevant information (age, residential area, marital status, HIV transmission routes, sexual orientation, and infection period). All of the above statistical analyses were done in IBM SPSS Statistics v24.0.

Then, this study utilized R version 4.3.3 for network analysis to explore the intrinsic relationship between death anxiety and depression among MLWHA. In this section, we first performed network estimation. In the network structure, the Least Absolute Shrinkage and Selection Operator (LASSO) and the Extended Bayesian Information Criterion (EBIC)[36] were used. Each symptom is viewed as a "node" and the association between symptoms is viewed as an "edge". Thicker edges suggest stronger associations between symptoms. The blue line represents a positive correlation, and the red line represents a negative correlation. In addition, to make the model more intuitive, we used the R package bootnet[37] and qgraph[38] to present the network structure model in a more visual way.

In the second step, to determine the importance of each node in the network, we calculated the centrality indices, including strength, betweenness, and closeness.[37] Strength refers to the sum of absolute weights of edges from a node to other nodes in the network. Betweenness refers to the number of times a node is on the shortest path of the other two nodes. Closeness reflects the degree to which a node is indirectly connected to other nodes. Since strength contains more information and it is more stable than betweenness and closeness.[30,39] In the network analysis, we focus more on the strength index. In addition, we calculated the predictability of each node. The predictability of a node refers to the proportion of variance explained by the node directly associated with it, which can also reflect the controllability of a network model.[40] In order to identify the bridge symptoms that play a key connecting role between death anxiety and depression, we calculated bridge strength index using the bridge function.[41]

Finally, in this section of the network analysis, we assessed the accuracy and stability of the network structure. The stability of the centrality indices was assessed by calculating the Correlation Stability Coefficient (CS-C), which should be no less than 0.25 and ideally greater than 0.5.[37] Additionally, we calculated the 95% confidence intervals (CI) for the edge weights using the non-parametric bootstrap method.[42] The narrower the 95% CI, the higher the stability of the network. And we also assessed the stability of node strength within the network structure through the bootstrapped difference tests.

Results

Personal Information of Participants

In this study, the age range of participants was from 18 to 70 years old (M_{age}=37.4, SD=10.3). Among them, 628 participants lived in urban/town areas, while 73 participants lived in rural areas. Regarding marital status, there were 459 single participants, 141 married/cohabiting participants, and 101 divorced/separated/widowed participants. In terms of HIV transmission routes, 551 cases were due to homosexual sexual contact, 22 cases were due to heterosexual contact, 10 cases were due to blood transmission, and the route was unclear for 118 cases. As for sexual orientation, there were 494 homosexual participants, 54 heterosexual participants, 139 bisexual participants, and 14 asexual/other participants. In terms of the stage of infection, there were 13 participants in the acute phase, 524 in the asymptomatic phase, and 164 in the AIDS phase. See Table 1 for more information.

Differences in Death Anxiety and Depression Among Different Subgroups

In this study, 18.1% of participants may suffer from severe depression. The average score for depression among participants was 11.18 (7.68), while the average score for death anxiety was 6.93 (3.58). This study examined the differences in death anxiety and depression scores between different subgroups of personally relevant information through independent sample t-tests and one-way ANOVA. The present study found significant differences in depression scores between MLWHA with different sexual orientations (F=3.454, P<0.05). Post hoc test showed that the depression scores of homosexual MLWHA were significantly higher than heterosexual MLWHA (11.60 > 8.37, P<0.01). The study also found significant differences in the death anxiety

Table 1 Personal Information of Participants in This Study

Variable	N (%)
Age	
18–44	533(76.0)
≥45	168(24.0)
Residential area	
Urban/Town	628(89.6)
Rural	73(10.4)
Marital status	
Single	459(65.5)
Married/cohabiting	141(20.1)
Divorced/Separated/ Widowed	101(14.4)
HIV transmission routes	
Heterosexual contact	22(3.2)
Homosexual contact	551(78.6)
Blood transmission	10(1.4)
Unclear	118(16.8)
Sexual orientation	
Heterosexuality	54(7.7)
Homosexuality	494(70.5)
Bisexual	139(19.8)
Asexual/Other	14(2.0)
Infection period	
Acute phase	13(1.9)
Asymptomatic phase	524(74.7)
AIDS	164(23.4)

scores between MLWHA with different marital status (F=7.121, $P<0.001$). Post hoc test showed that unmarried participants had significantly higher death anxiety scores than divorced/separated/widowed participants ($7.22 > 5.75$, $P < 0.001$). Similarly, the death anxiety score of married/cohabiting participants was also significantly higher than that of divorced/separated/widowed participants ($6.85 > 5.75$, $P < 0.05$).

Network Structure

Figure 1 shows the network structure of death anxiety and depression. In this network structure, the strongest linked edges were PHQ1-PHQ2 (Anhedonia – Sad mood). Followed by, DAS5-DAS7 (No fear of death at all - Not troubled by the thought of death). These two edges were the strongest linked edges in depression and death anxiety, respectively. The strongest edge connecting death anxiety and depression was DAS2-PHQ9 (Rarely think of death – Suicide ideation). In the network, the average predictability of all nodes was 0.78 (Table S1). This means that 78.0% of the variation in each node can be explained by neighboring nodes.

Figure 2 shows the centrality index of each node in the death anxiety and depression network. In this network, DAS10 (The topic of post death is very confusing to me) had the highest strength centrality index, followed by PHQ2 (Sad mood) and PHQ6 (Guilty feelings). This indicated that these symptoms were central symptoms in the network and they had relative significant impacts on the whole network. The strength centrality index of DAS3 (I do not get nervous talking about death), DAS4 (Fear of surgery), and DAS6 (No fear of cancer) were low, indicating that these symptoms were marginal symptoms in the network.

As shown in Figure 3, the bridge strength index of DAS2 (Rarely think of death) was the highest. Followed by PHQ6 (Guilt feelings), PHQ9 (Suicide ideation). This suggested that these symptoms were important links that lead to the comorbidity of death anxiety and depression.

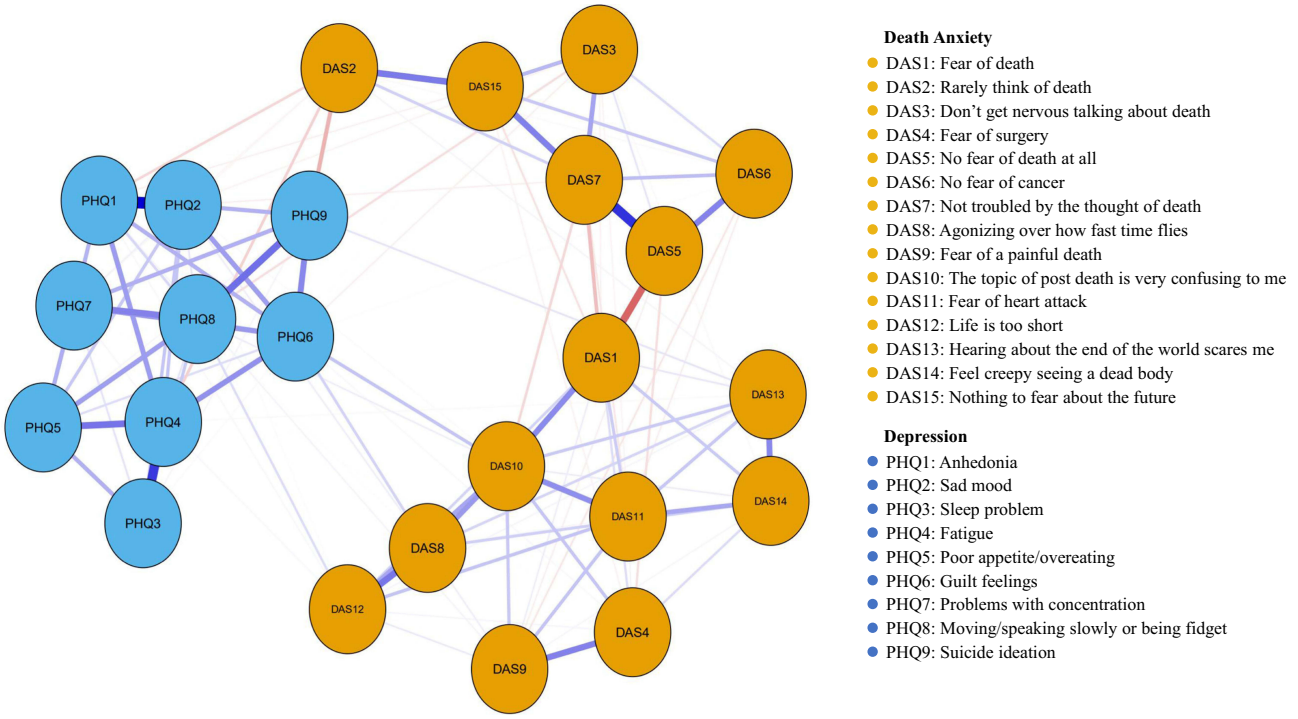

Figure 1 Network structure of death anxiety and depression in men living with HIV/AIDS. Note: In the diagram, the thickness of an edge indicates the strength of the correlation. Blue edges represent positive associations and red edges represent negative associations between nodes.

Network Stability

The network structure had good stability. Different proportions of case-dropping tests showed that CS-C were greater than 0.50, indicating that the network model had good robustness and stability (Figure 4). In addition, the 95% CI for non-parametric bootstrapping edge weights was narrow, indicating good accuracy of the model (Figure S1). The nonparametric bootstrapped difference test for strength is also presented in Figure S2.

Discussion

In the present study, network analysis was applied to investigate the relationship between death anxiety and depression in MLWHA. It was found that 18.1% of MLWHA may suffer from severe depression. The prevalence of depression in MLWHA is significantly higher than the general population.[43] HIV infection is associated with a greater risk of developing major depression.[44] Depression, as a common psychological disorder among MLWHA, not only seriously affects the mental health status, it also reduces their treatment compliance, resulting in poor health outcomes. Furthermore, the mean score of death anxiety among MLWHA in this study was (6.93 ± 3.58), which was similar to the death anxiety score among MLWHA in Hintze's study (6.82 ± 4.54).[20] Death anxiety is one of the most common psychological sequelae in PLWHA.[18] Anxiety and fear of death can lead to avoidance behaviors in PLWHA, such as not cooperating with treatment or avoiding normal social interactions, which can exacerbate patient's sense of hopelessness. The next plan of this project is to provide professional psychological counseling services, delivered by hospital psychologists, to MLWHA who screen positive for depression or experience severe death anxiety. The aim is to optimize their mental health and improve their quality of life.

The present study found that homosexual MLWHA had significantly higher depression scores than heterosexual MLWHA. This may be influenced by a number of factors. Prejudice, family support, and hostility are all important factors that influence the depressive status of MLWHA.[45] Based on the Minority Stress Theory,[46] homosexual people are facing both external pressures (eg stigmatization, social rejection, not being understood by family and friends) and internal pressures (eg internalized homophobia and loneliness).[47] These pressures can facilitate negative emotions in the homosexual community and increase the risk of developing mental health problems such as depression and anxiety.[48] As

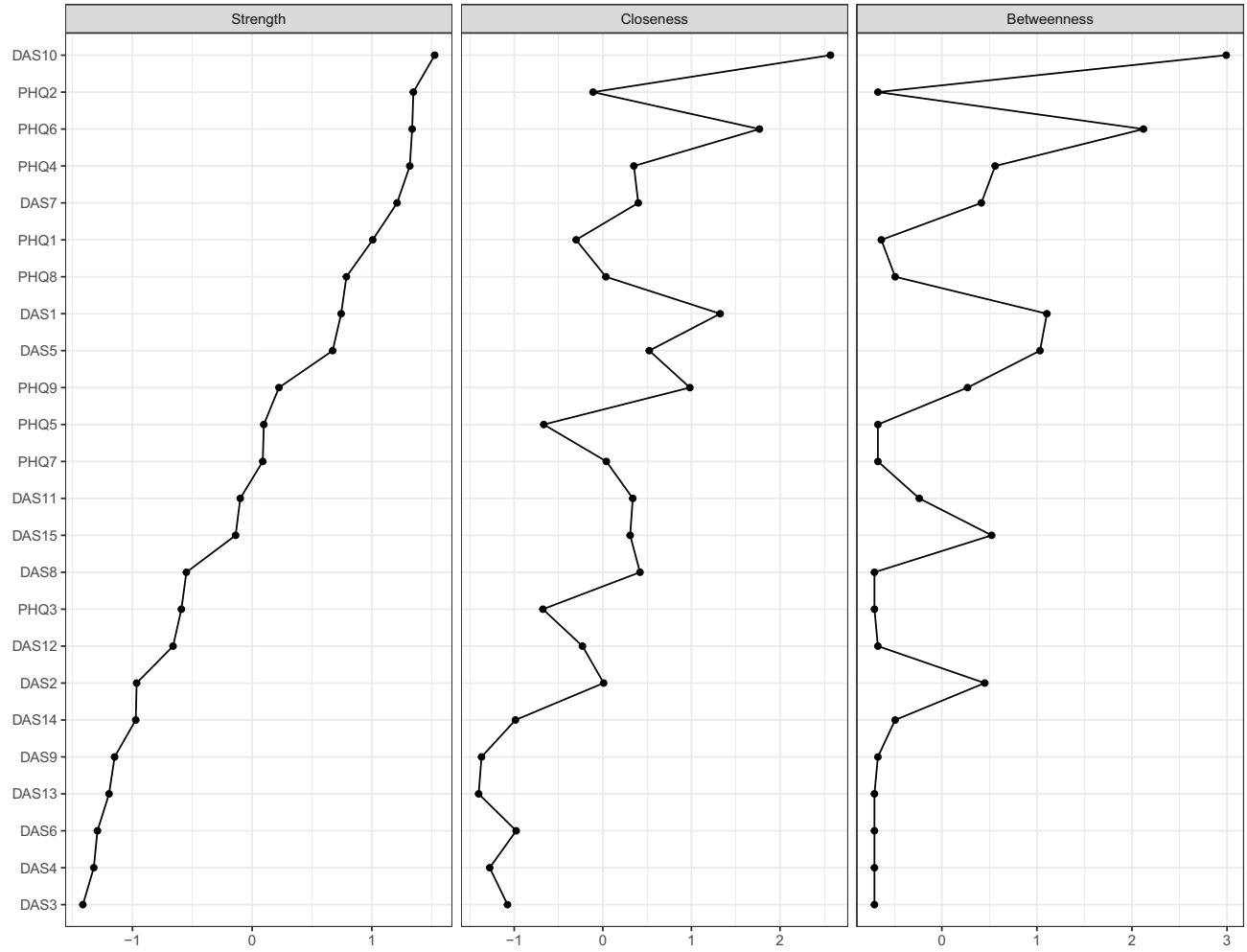

Figure 2 Centrality indices of the network model.
Note: DAS = Death anxiety scale, PHQ = Patient health questionnaire.

a result, depression may be more severe in homosexual MLWHA than in heterosexual MLWHA. In addition, this study also found that unmarried and married/cohabiting MLWHA had significantly higher death anxiety scores than divorced/separated/widowed MLWHA. Compared to divorced PLWHA, married patients tend to face greater family responsibilities and bear more expectations from their families.[49] These invisible pressures have increased the anxiety of married MLWHA about the future and death. Unmarried MLWHA tend to be younger in age. Before the diagnosis of HIV, they are often full of hope and have great expectations for their futures, and even make good plans for their lives. However, the diagnosis of HIV will disrupt their normal life and rhythm.[50] The incurable nature of HIV and the fear and worry about the death aggravate the death anxiety of young and unmarried MLWHA.

Through the different proportions of case-dropping tests, the centrality indicator of this study was robust, and it can identify the central symptoms in the death anxiety and depression network of MLWHA with greater accuracy. The present study founded that DAS10 (The topic of post death is very confusing to me) was the most central symptom in the death anxiety and depression network of MLWHA. This indicates that DAS10 had the greatest impact on the entire network and it had the strongest connection with other symptoms.

The topic of post death has been troubling humanity for thousands of years.[51] As AIDS is still an incurable disease,[52] the fear and anxiety of death may cause MLWHA to feel helpless and desperate, and more easier to be influenced by death and post death topics. As the course of the disease continues to extend, MLWHA may experience various physical and psychological impairments. The lack of control and uncertainty over the disease may lead to severe psychological

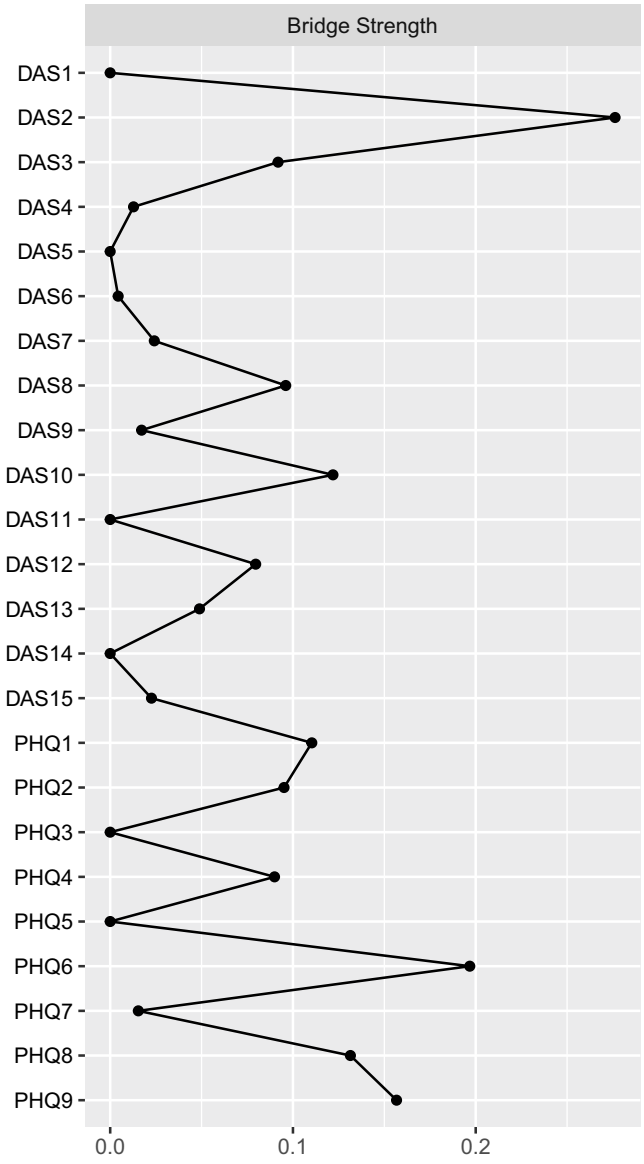

Figure 3 The bridge strength of each nodes in the network.

distress regarding death in MLWHA.[53] As a result, compared to healthy individuals, MLWHA are more likely to have thoughts and concerns about death and post death topics. In addition, MLWHA may face a lot of social discrimination and hostility, which may cause them to feel rejected by the society.[45] The sense of loneliness may cause them to be more confused about post death topics because they are afraid of being stigmatized and forgotten after they die. ARVs is a long-term and complex process.[54] The treatment compliance and medication adherence of PLWHA play important roles in suppressing the HIV virus.[55] Family members and friends, as the most common contact with PLWHA, should carefully supervise the treatment process of HIV patients in daily life, and urge them to use drugs and treatment on time, so as to reduce the physical and mental damage of the virus to PLWHA. At the same time, family members and friends should often use positive emotional expressions to help PLWHA to correctly view the disease and relieve their psychological pressures to minimize the disturbances caused by post-death topics for PLWHA.

Bridge symptoms can be viewed as a transdiagnostic, and they play important roles in the co-initiation of the disease.[41] The intervention of bridge symptoms can effectively reduce the occurrence of both diseases.[56] As mentioned earlier, death anxiety and depression were comorbid psychological symptoms.[17,18] In the present study, based on the

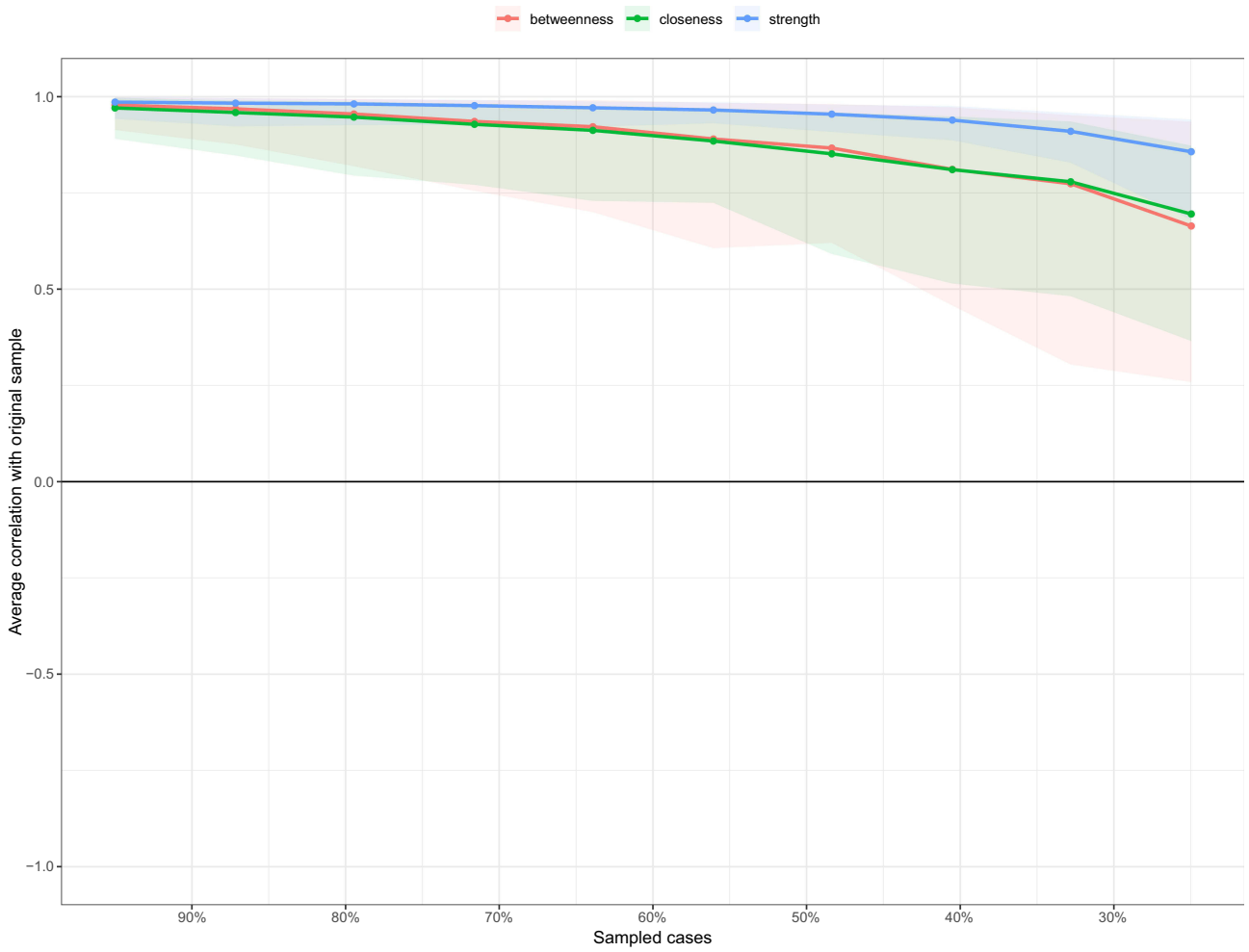

Figure 4 The stability of centrality index of the death anxiety and depression network.

bridge strength centrality index, we identified strong bridge symptoms in the death anxiety and depression network in MLWHA as DAS2 (Rarely think of death), PHQ6 (Guilt feelings), and PHQ9 (Suicide ideation). In addition, DAS2 – PHQ9 (Rarely think of death – Suicide ideation) was also the strongest edge connecting death anxiety and depression.

DAS2 (Rarely think of death) was the strongest bridge symptom between death anxiety and depression. In everyday life, people think of death to a greater or lesser extent.[57] For patients suffering from an incurable disease, the increase of death thoughts is normal.[58] Since PLWHA are facing both external social stigma and internal self-stigma, these may cause mental problems such as depression and anxiety,[59] increasing frequency for PLWHA to think about death. In addition, due to limitations in the independence, autonomy, and quality of life of MLWHA, thoughts related to death may significantly increase in MLWHA compared to general population. Moreover, one study found that the increased thoughts of death often coincided with the peak of psychological stress.[58] Adopting problem-focused coping strategies, and proactively seeking social support can reduce the level of pain felt by MLWHA. In China, the government, social organizations and communities should strive to implement the policy of "Four Frees and One Care", and provide equal pay for equal work for MLWHA and other employees. More social support and assistance should be provided to MLWHA to reduce their mental distress and death-related thoughts.

In the network structure of this study, there was a strong association between frequent thoughts of death and suicide ideation. Frequent thoughts of death may serve as a significant precursor to the onset of suicidal ideation in MLWHA. Moreover, as a key bridge symptom in the network, suicide ideation is also a common psychological response among PLWHA. Previous studies have confirmed that the suicide ideation of PLWHA was higher than the general population.[60]

This may be because PLWHA often face increased stigma, lack of social support and hostility, etc.[61,62] Self-stigma can easily cause PLWHA to fall into a state of self-doubt and self-denial, which increases the risk of suicide ideation. In addition, PLWHA often experience a lot of social exclusion, receive less social support, and often face challenges from disease, work, and life alone, which make them more likely to have suicide ideation.[63] People with defects in executive functions may lack the ability of rational thinking, be less reflective, and tend to make impulsive decisions when under stressful situations, such as suicide.[64,65] Moreover, previous studies have confirmed that executive functions mediated the relationship between self-stigmatization and suicide ideation among MLWHA.[65] Improving self-regulation skills can help to reduce self-stigmatization among MLWHA. At the same time, setting appropriate motivational goals to promote behavioral changes can improve executive functions in MLWHA. These interventions all contribute to the reduction of suicide ideation in MLWHA.[65]

Limitations

There were several limitations in this study. First of all, the study was a cross-sectional design; hence, it cannot determine the causal relationship between symptoms. Second, the survey data was obtained through self-report surveys, which may be subjectively biased. At last, this study only investigated the network structure of death anxiety and depression in MLWHA. More psychological symptoms of MLWHA should be considered in future studies.

Conclusions

In the death anxiety – depression network, "The topic of post death is very confusing to me" is the most central symptom, while "Rarely think about death" serves as the strongest bridging symptom. Furthermore, the edge "Rarely think about death - Suicidal ideation" was the strongest edge linking death anxiety and depression. This indicates that MLWHA perceptions and thoughts about death not only affect their mental health but are also related to their suicidal ideation. When MLWHA experience death anxiety, it can result in a diminished sense of life's meaning, thereby increasing their risk of depression. At the same time, severe depression may also cause MLWHA to think frequently about death-related content, a vicious cycle that increases their risk for psychological distress.

Therefore, in clinical practice and daily life, it is especially important to focus on MLWHA perceptions and thoughts about death, suicidal ideation, and the relationships between these psychological symptoms. Corresponding intervention measures can be taken to address these symptoms, such as popularizing correct awareness of death and providing professional psychological treatment. These measures not only help reduce the co-occurrence of death anxiety and depression among MLWHA but also play a crucial role in improving their psychological well-being and quality of life.

Acknowledgments

We acknowledge all the participants who contributed to this study.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

This work was supported by Nature Science Foundation of Jilin Province Science and Technology Department (20210101434JC).

Disclosure

The authors declare that they have no competing interests.

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