

Epidemiological Characteristics of Infectious Diseases Among Homeless Individuals With Mental Illness and Development of a Seamless Care Model in Southern China

Linli Feng

Hainan Provincial Anning Hospital

Xiaoling Cheng

1035140436@qq.com

Quanzhou Third Hospital

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Abstract

Background

Homeless individuals with mental illness represent a highly vulnerable population with limited access to healthcare, poor living conditions, impaired self-care capacity, and increased susceptibility to infectious diseases. However, epidemiological data on infectious diseases in this population remain limited, particularly in China. This study aimed to investigate the prevalence, distribution, and associated factors of infectious diseases among homeless individuals with mental illness and to develop a seamless care model for integrated management.

Methods

This cross-sectional study included 617 homeless individuals with mental illness admitted to a social welfare psychiatric facility in Haikou, China. Demographic characteristics, psychiatric diagnoses, and laboratory-confirmed infectious disease status were collected through institutional records and structured assessments. Binary logistic regression was used to identify factors associated with infectious disease status. In addition, a seamless care model was developed based on epidemiological findings, literature review, and stakeholder interviews.

Results

Among the 617 participants, 131 were diagnosed with at least one infectious disease, yielding an overall prevalence of 21.23%. Most infected individuals had a single infection, whereas 8.40% had co-infections. Viral hepatitis was the most common infectious disease, accounting for 66.41% of infected cases, followed by syphilis, pulmonary tuberculosis, and HIV/AIDS. Multivariable logistic regression showed that male sex, unemployment or unknown occupational status, unmarried status, and psychiatric diagnosis were significantly associated with infectious disease status. Based on these findings, a seamless care model was proposed, integrating mobile screening, electronic health records, rapid referral, standardized treatment, health education, psychosocial rehabilitation, and intersectoral collaboration.

Conclusions

Infectious diseases are common among homeless individuals with mental illness in southern China, with viral hepatitis and syphilis representing the major disease burden. Demographic vulnerability, social instability, and psychiatric conditions may jointly contribute to infection risk. The proposed seamless care model provides a structured framework for early detection, continuous treatment, rehabilitation

support, and public health coordination in this marginalized population. Future multicenter and prospective studies are warranted to validate the effectiveness and scalability of this model.

Introduction

Homelessness and mental illness are two closely interrelated public health challenges that often coexist and reinforce each other. Individuals experiencing homelessness frequently face unstable living environments, poor nutrition, limited sanitation, social isolation, and restricted access to routine healthcare. When homelessness is accompanied by severe mental illness, impaired cognition, reduced judgment, poor treatment adherence, and limited self-care capacity may further increase vulnerability to infectious diseases[1–3]. These overlapping disadvantages make homeless individuals with mental illness a particularly high-risk and underserved population.

Previous studies have shown that people experiencing homelessness are more likely to be affected by communicable diseases, including viral hepatitis, syphilis, tuberculosis, and HIV/AIDS. The elevated risk may be related to crowded or unsanitary living conditions, delayed diagnosis, poor continuity of care, high-risk behaviors, and limited access to preventive services[4, 5]. However, most existing studies have focused on the general homeless population, while individuals with mental illness have often been treated as a subgroup or confounding factor rather than as a distinct population requiring targeted investigation. As a result, the epidemiological characteristics and management needs of homeless individuals with mental illness remain insufficiently understood[6, 7].

In China, homeless individuals with mental illness represent a complex group at the intersection of psychiatric care, infectious disease control, social welfare, and public security services. Many lack stable family support, formal identification, medical insurance, or the ability to seek help independently. They are often identified through rescue stations, police referral, emergency medical services, or social welfare institutions. This fragmented pathway may lead to delayed screening, interrupted treatment, inadequate follow-up, and difficulty in long-term rehabilitation. Therefore, infectious disease prevention and control in this population requires not only clinical diagnosis and treatment, but also a coordinated system that connects medical institutions, public health agencies, social welfare departments, and community-based rehabilitation resources[8, 9].

Despite the clinical and public health importance of this issue, systematic data on infectious diseases among homeless individuals with mental illness in China remain limited. Moreover, few studies have attempted to translate epidemiological findings into an integrated management framework. In the present study, we conducted a cross-sectional investigation of 617 homeless individuals with mental illness admitted to a social welfare psychiatric facility in Haikou, China. We analyzed the prevalence and distribution of infectious diseases, identified demographic and clinical factors associated with infection risk, and developed a seamless care model based on quantitative findings, literature review, and stakeholder interviews. This study aims to provide evidence for targeted screening, integrated management, and policy optimization for this highly vulnerable population.

Methods

Study Design and Setting

This cross-sectional study was conducted at a social welfare psychiatric facility in Haikou, Hainan Province, China. The study aimed to investigate the prevalence, distribution, and associated factors of infectious diseases among homeless individuals with mental illness and to develop a seamless care model for integrated management. The study combined quantitative epidemiological analysis with literature review and stakeholder interviews to inform the construction of the proposed management framework. Ethical approval was obtained from the institutional review board of Hainan Provincial Anning Hospital. Written informed consent was obtained from all participants or, when appropriate, from their legal guardians or authorized representatives[10].

Participants

A total of 617 homeless individuals with mental illness were included in this study. Participants were eligible if they met the following criteria: 1) aged 18 years or older; 2) diagnosed with a psychiatric disorder according to the Chinese Classification and Diagnostic Criteria of Mental Disorders; 3) had a documented history of homelessness or vagrancy lasting more than three months and no fixed residence; 4) were able to complete basic communication or participate in interviews with assistance from trained staff; and 5) agreed to participate in the study and provided informed consent. Participants were excluded if they had severe terminal physical illnesses, such as advanced malignant tumors or severe cardiovascular or cerebrovascular diseases; were unable to cooperate with data collection because of acute psychotic symptoms, severe cognitive impairment, or refusal to participate; were already receiving long-term inpatient treatment or living in a formal shelter institution before rescue; or had severe violent behavior that posed safety risks to staff or other participants.

Data Collection

Demographic and clinical information was collected through institutional medical records, rescue registration documents, and structured assessments conducted by trained psychiatric nurses and social workers. The collected variables included sex, age, occupational status, marital status, educational level, psychiatric diagnosis, and infectious disease status. To protect participants' privacy, personal identifiers were removed before data analysis. Psychiatric diagnoses were classified according to the Chinese Classification and Diagnostic Criteria of Mental Disorders. Infectious diseases included viral hepatitis, syphilis, pulmonary tuberculosis, and HIV/AIDS. Infectious disease status was determined based on laboratory test results, imaging findings when applicable, and clinical diagnoses recorded in the institutional medical system. Viral hepatitis included hepatitis B and hepatitis C virus infections. Syphilis and HIV/AIDS were identified using serological testing. Pulmonary tuberculosis was diagnosed

according to clinical symptoms, chest imaging, sputum testing, and specialist assessment when available.

Quality Control

Before data collection, all investigators received standardized training on questionnaire administration, medical record abstraction, variable definition, and data entry. A unified data collection form was used to ensure consistency. All data were entered using a double-checking procedure. Duplicate records, logically inconsistent entries, and incomplete key variables were reviewed by two independent researchers. Discrepancies were resolved through discussion and rechecking of original records. The final dataset was de-identified before statistical analysis.

Literature Review

A structured literature review was conducted to support the development of the seamless care model. Relevant studies and policy documents were searched using PubMed, Web of Science, CNKI, and official public health sources. Search terms included combinations of “homeless individuals,” “mental illness,” “infectious diseases,” “viral hepatitis,” “syphilis,” “tuberculosis,” “HIV,” “integrated care,” and “seamless management.” The review focused on infectious disease burden, risk factors, public health management strategies, psychiatric rehabilitation, and intersectoral care models for homeless or mentally ill populations.

Stakeholder Interviews

Semi-structured interviews were conducted with key stakeholders involved in the care and management of homeless individuals with mental illness. Interviewees included psychiatric clinicians, nursing staff, public health workers, staff from disease prevention and control institutions, and administrators from social welfare or rescue service agencies. The interviews explored practical challenges in screening, referral, treatment, follow-up, rehabilitation, information sharing, and interdepartmental coordination. The qualitative information obtained from these interviews was used to identify gaps in current practice and to refine the structure of the proposed seamless care model.

Development of the Seamless Care Model

The seamless care model was developed based on three sources of evidence: the epidemiological findings from the present cohort, the literature review, and stakeholder interview results. The model was designed to address major barriers in the management of infectious diseases among homeless individuals with mental illness, including delayed detection, poor treatment continuity, limited health literacy, weak family or social support, and fragmented interdepartmental collaboration. The proposed model consisted of several interconnected components: mobile outreach and early screening, electronic

health record establishment, rapid referral through a green-channel mechanism, standardized treatment and rehabilitation, health education and behavioral intervention, psychosocial support and social reintegration, dynamic data monitoring, and multi-agency collaboration. The model aimed to create a continuous pathway linking screening, diagnosis, treatment, rehabilitation, follow-up, and public health surveillance.

Statistical Analysis

Statistical analysis was performed using SPSS version 25.0. Continuous variables were presented as mean $\pm$ standard deviation, whereas categorical variables were summarized as frequencies and percentages. Categorical variables were compared using the chi-square test or Fisher's exact test, as appropriate. Continuous variables were compared using Student's t-test or one-way analysis of variance when applicable. Binary logistic regression analysis was performed to identify factors associated with infectious disease status. Variables with clinical relevance or statistical significance in univariate analysis were included in the multivariable logistic regression model. Odds ratios and 95% confidence intervals were calculated. A two-sided P value of less than 0.05 was considered statistically significant.

Results

1. Demographic Characteristics of the Study Population

A total of 617 homeless individuals with mental illness were included in this study. Among them, 351 were male and 266 were female, accounting for 56.89% and 43.11% of the cohort, respectively. The mean age was 36.45 ± 10.79 years. The largest age group was 31–55 years, comprising 376 participants, followed by those aged 19–30 years. Only a small proportion of participants were aged 56 years or older or 18 years or younger.

Regarding occupational status, nearly half of the participants were unemployed, while more than one-third had unknown occupational information. Most participants were unmarried. Educational information was unavailable for a large proportion of the cohort. Among participants with available educational records, junior high school and primary school were the most common educational levels. Dementia was the most frequent psychiatric diagnosis, followed by other psychiatric disorders, intellectual disability, and epilepsy. The detailed demographic and clinical characteristics are shown in Table 1.

Table 1
Demographic and Clinical Characteristics of the Study Population

Variable	n	(%)	χ^2 Value	P Value
Gender			4.210	0.040
Male	351	56.89		
Female	266	43.11		
Age			45.063	< 0.001
≤ 18	4	0.65		
19 ~ 30	217	35.17		
31 ~ 55	376	60.94		
≥ 56	20	3.24		
Occupation			12.243	0.002
Employed	75	12.16		
Unemployed	303	49.11		
Unknown	239	38.74		
Marital			8.972	0.028
Married	96	15.56		
Unmarried	347	56.24		
Divorced	15	2.43		
Widowed	40	6.48		
Education			20.561	< 0.001
Primary	31	5.02		
Junior high	64	10.37		
Vocational	5	0.81		
Unknown	517	83.79		
Diagnosis			15.784	0.001
Intellectual disability	44	7.13		
Dementia	437	70.83		
Epilepsy	16	2.59		

Variable	n	(%)	χ^2 Value	P Value
Other	120	19.45		

2. Prevalence and Distribution of Infectious Diseases

Among the 617 participants, 131 were diagnosed with at least one infectious disease, corresponding to an overall prevalence of 21.23%. The remaining 486 participants had no documented infectious disease. Among the infected individuals, 120 had a single infection, accounting for 91.60% of infected cases, whereas 11 had two or more concurrent infections, accounting for 8.40%.

Viral hepatitis was the most common infectious disease, identified in 87 participants. It accounted for 66.41% of all infected cases and 14.10% of the total study population. Syphilis was identified in 29 participants, accounting for 22.14% of infected cases and 4.70% of the total population. Pulmonary tuberculosis was observed in 12 participants, accounting for 9.16% of infected cases and 1.94% of the total population. HIV/AIDS was the least frequent infection, with 3 cases, accounting for 2.29% of infected cases and 0.49% of the total population. These findings indicate that viral hepatitis and syphilis constituted the major infectious disease burden in this population.(Fig. 1 and Fig. 2)

3. Characteristics of Participants With Infectious Diseases

Among the 131 participants with infectious diseases, 83 were male and 48 were female, accounting for 63.36% and 36.64%, respectively. The majority of infected participants were aged 31–55 years, followed by those aged 19–30 years and those aged 56 years or older. Only one infected participant was 18 years or younger.

With respect to occupational status, unemployed participants represented the largest proportion of infected individuals, followed by those with unknown occupational status. In terms of marital status, most infected participants were unmarried, while smaller proportions were married, widowed, or divorced. Educational information was unknown in more than half of infected participants. Among those with available records, junior high school was the most common educational level. Dementia was the most frequent psychiatric diagnosis among infected individuals, followed by other psychiatric disorders, intellectual disability, and epilepsy. Detailed characteristics of infected participants are presented in Table 2.

Table 2
Characteristics of Participants With Infectious Diseases

Variable	n	(%)	χ^2 Value	P Value
Gender			25.398	< 0.001
Male	83	63.36		
Female	48	36.64		
Age			11.778	< 0.001
≤ 18	1	0.76		
19 ~ 30	28	21.37		
31 ~ 55	84	64.12		
≥ 56	18	13.74		
Occupation			15.310	< 0.001
Employed	8	6.11		
Unemployed	76	58.02		
Unknown	47	35.88		
Marital			17.270	< 0.001
Married	30	22.90		
Unmarried	77	58.78		
Divorced	8	6.11		
Widowed	16	12.21		
Education			9.150	< 0.001
Primary	12	9.16		
Junior high	42	32.06		
Vocational	2	1.53		
Unknown	75	57.25		
Diagnosis			15.255	< 0.001
Intellectual disability	17	12.98		
Dementia	93	70.99		
Epilepsy	3	2.29		

Variable	n	(%)	χ^2 Value	P Value
Other	18	13.74		

4. Factors Associated With Infectious Disease Status

Binary logistic regression analysis was performed to identify factors associated with infectious disease status. Male sex was significantly associated with a higher likelihood of infection compared with female sex. Occupational status was also significantly associated with infection risk; participants who were unemployed or had unknown occupational information had a higher likelihood of infectious disease than those who were employed. Marital status was another significant factor, with unmarried participants showing a higher likelihood of infection compared with married participants. Psychiatric diagnosis was also associated with infectious disease status, suggesting that infection risk may differ across psychiatric diagnostic categories.

In contrast, age and educational level were not significantly associated with infectious disease status in the regression model. The detailed regression results, including odds ratios, 95% confidence intervals, and P values, are shown in Table 3.

Table 3
Logistic Regression Analysis of Factors Associated With Infectious Disease Status

Variable	β Coefficient	Standard Error	Wald χ^2	OR	95%CI	P Value
Sex (Male vs Female)	0.286	0.137	5.123	1.352	1.120 ~ 1.894	0.047
Age (≥ 31 vs < 31)	0.045	0.764	0.054	1.043	0.226 ~ 4.767	0.396
Occupation (Unemployed/Unknown vs Employed)	1.264	0.713	3.402	3.546	1.105 ~ 5.280	0.029
Marital Status (Unmarried vs Married)	1.897	0.449	5.138	3.270	2.144 ~ 4.768	0.038
Education (Unknown vs Known)	0.703	0.392	3.291	2.018	0.859 ~ 4.023	0.114
Psychiatric Diagnosis (Dementia vs Others)	1.130	0.724	2.506	3.049	1.734 ~ 8.456	0.049

5. Literature Review and Stakeholder Interview Findings

The literature review showed that existing studies on infectious diseases among homeless individuals with mental illness remain limited. Most available studies focused on general homeless populations,

isolated infectious disease screening, or fragmented management strategies, with relatively few studies addressing integrated care for individuals affected by both homelessness and mental illness.

Stakeholder interviews further identified several practical challenges in the management of this population, including delayed detection of infectious diseases, difficulty in follow-up, poor treatment continuity, limited health awareness, inadequate family or social support, and insufficient data sharing between psychiatric institutions, public health agencies, social welfare departments, and rescue service systems. These findings supported the need for an integrated and continuous care model. The summarized evidence from previous studies, including reported risk factors and recommended management strategies for homeless individuals with mental illness or related vulnerable populations, is presented in Table 4.

Table 4
Summary of Representative Studies on Risk Factors and Management Strategies for Infectious Diseases Among Homeless or Mentally Ill Populations

Study	Year	Reported Risk Factors	Recommended Management Strategies
Caroline[22]	2024	Demographics, crowding, hygiene	Highlight systematic risk evaluation and hygiene improvements
Michael[23]	2023	Fragmented health systems	Data sharing, mobile outreach, cross-sector staff model
Jessica[24]	2022	Unsheltered individuals, chronic illness	Shelter-based care, integrated medical & behavioral health services
Lexie[25]	2024	Trimorbid homelessness (SUD, mental)	Mobile-integrated care teams reduce ED utilization & improve outcomes

6. Development of the Seamless Care Model

Based on the epidemiological findings, literature review, and stakeholder interviews, a seamless care model was developed for managing infectious diseases among homeless individuals with mental illness. The model consisted of six interconnected modules: mobile outreach and screening, electronic health record integration, rapid referral through a green-channel mechanism, health education and behavioral intervention, psychosocial rehabilitation support, and multi-agency collaboration with data exchange.

The model was designed to establish a continuous pathway from early identification to diagnosis, treatment, rehabilitation, follow-up, and public health monitoring. Mobile outreach and screening aim to improve early detection among high-risk individuals. Electronic health records support information continuity and reduce repeated or missing assessments. The green-channel referral mechanism facilitates timely diagnosis and treatment. Health education and behavioral intervention are intended to reduce transmission risk and improve self-management capacity. Psychosocial rehabilitation and social support help promote functional recovery and social reintegration. Multi-agency collaboration enables coordination among hospitals, disease control institutions, rescue centers, and social welfare

services. Together, these modules form a closed-loop management framework that addresses both medical and social needs in this vulnerable population. The structure of the proposed model is shown in Fig. 3.

Discussion

In this cross-sectional study of 617 homeless individuals with mental illness in southern China, we found that infectious diseases were common in this highly vulnerable population. The overall prevalence of infectious diseases was 21.23%, and most infected individuals had a single infection rather than multiple concurrent infections. Viral hepatitis was the most frequent infectious disease, followed by syphilis, pulmonary tuberculosis, and HIV/AIDS. In addition, male sex, unemployment or unknown occupational status, unmarried status, and psychiatric diagnosis were significantly associated with infectious disease status. Based on these epidemiological findings, literature review, and stakeholder interviews, we further developed a seamless care model integrating early screening, clinical treatment, rehabilitation support, data monitoring, and intersectoral collaboration. These findings provide useful evidence for infectious disease prevention and integrated health management among homeless individuals with mental illness.

The infectious disease burden observed in this study highlights the compounded vulnerability of individuals affected by both homelessness and mental illness. Homelessness is often associated with unstable living conditions, poor sanitation, inadequate nutrition, limited access to healthcare, and delayed diagnosis[11]. Mental illness may further impair self-care ability, judgment, treatment adherence, and the capacity to seek medical help. These overlapping disadvantages may explain why infectious diseases remain common in this population[12]. Although direct comparison across studies is difficult because of differences in population characteristics, diagnostic criteria, healthcare access, and disease surveillance systems, our findings are broadly consistent with previous reports showing an increased infectious disease burden among people experiencing homelessness and those with severe mental illness.

Viral hepatitis represented the largest proportion of infectious diseases in our cohort. This finding suggests that blood-borne infections may be a major public health concern among homeless individuals with mental illness. Possible explanations include poor health awareness, inadequate vaccination or screening coverage, delayed access to antiviral assessment, and potential exposure to high-risk behaviors or unsafe living environments[13]. Syphilis was the second most common infection, indicating that sexually transmitted infections also require attention in this population[14]. Although pulmonary tuberculosis and HIV/AIDS accounted for relatively smaller proportions, their potential for transmission and long-term health consequences should not be underestimated, particularly in settings where follow-up and treatment continuity are difficult to maintain[15].

Several demographic and clinical factors were associated with infectious disease status. Male participants had a higher likelihood of infection, which may reflect greater exposure to street-based living, poorer healthcare-seeking behavior, or higher rates of risk behaviors. Occupational status was also

associated with infection risk. Participants who were unemployed or had unknown occupational information may represent a more socially marginalized subgroup with unstable living conditions, weaker access to healthcare, and limited social support. However, the interpretation of “unknown occupation” should be cautious, as it may partly reflect missing information rather than a true exposure category. Unmarried status was another significant factor, suggesting that lack of family support may contribute to delayed detection, poor treatment adherence, and reduced care continuity. Psychiatric diagnosis was also associated with infection risk, which may be related to differences in cognitive function, self-care capacity, symptom recognition, and ability to cooperate with screening or treatment[16–18].

The findings from literature review and stakeholder interviews further suggest that the management of infectious diseases in homeless individuals with mental illness cannot rely solely on isolated clinical treatment. In real-world practice, this population often moves across multiple systems, including psychiatric hospitals, social welfare institutions, rescue stations, disease control agencies, and community services. Fragmented information systems, unclear referral responsibilities, insufficient follow-up, and limited rehabilitation resources may all lead to discontinuity of care. Therefore, an integrated care pathway is needed to connect early detection, diagnosis, treatment, rehabilitation, and long-term monitoring[19].

The seamless care model proposed in this study was designed to address these gaps. The model begins with mobile outreach and early screening, which may help identify high-risk individuals who otherwise have limited access to routine medical services. Electronic health records can improve information continuity and reduce repeated or missing assessments. A green-channel referral mechanism may shorten the interval from detection to diagnosis and treatment. Standardized treatment and rehabilitation services are essential for improving disease control and psychiatric stabilization. Health education and behavioral intervention may reduce transmission risk and improve self-management capacity. Psychosocial rehabilitation, family involvement when feasible, and social reintegration support may further improve long-term outcomes. Finally, multi-agency collaboration and data sharing are critical for building a closed-loop system that links hospitals, public health institutions, social welfare agencies, and community services[20, 21].

From a public health perspective, this study has several implications. First, homeless individuals with mental illness should be regarded as a priority population for infectious disease screening, especially for viral hepatitis and syphilis. Second, infectious disease management should be embedded within psychiatric care and social welfare services rather than treated as a separate clinical issue. Third, risk stratification based on demographic and clinical characteristics may help allocate limited resources more efficiently. Fourth, long-term management should focus not only on infection treatment but also on psychiatric stabilization, rehabilitation, social support, and reintegration. These measures may reduce individual disease burden and potential community transmission risk.

This study has several strengths. To our knowledge, it represents one of the relatively large investigations focusing specifically on infectious diseases among homeless individuals with mental illness in China. The study included 617 participants and systematically described the distribution of several major infectious diseases. In addition, by combining epidemiological analysis, literature review, and stakeholder interviews, we translated observed clinical and public health problems into a practical management framework. This approach may provide useful experience for institutions managing similarly vulnerable populations.

Several limitations should also be acknowledged. First, this was a single-center study conducted in Haikou, and the findings may not be generalizable to other regions with different socioeconomic conditions, rescue systems, healthcare resources, or infectious disease profiles. Second, the cross-sectional design limits causal inference; therefore, the identified factors should be interpreted as associations rather than causal determinants. Third, information on important behavioral risk factors, such as sexual behavior, substance use, injection drug use, vaccination history, and previous treatment history, was not available or was difficult to collect reliably in this vulnerable population. Fourth, occupational and educational information was missing or unknown for a considerable proportion of participants, which may have affected the precision of subgroup analysis and regression estimates. Fifth, the seamless care model proposed in this study has not yet been prospectively validated; therefore, its effectiveness in reducing infection rates, improving treatment adherence, or promoting social reintegration remains to be tested.

Future studies should validate these findings in multicenter cohorts and include longitudinal follow-up to clarify infection incidence, treatment outcomes, reinfection risk, and long-term rehabilitation status. More detailed behavioral, clinical, and laboratory data should also be collected where ethically and practically feasible. In addition, prospective implementation studies are needed to evaluate the effectiveness, feasibility, cost-effectiveness, and scalability of the seamless care model in different institutional and regional settings. Such studies would help determine whether integrated management can improve health outcomes and reduce public health risks among homeless individuals with severe mental illness.

Conclusion

This study demonstrates a substantial burden of infectious diseases among homeless individuals with mental illness in southern China, with more than one-fifth of participants affected by viral hepatitis, syphilis, pulmonary tuberculosis, or HIV/AIDS. Viral hepatitis and syphilis represented the predominant infectious disease burden in this population. Male sex, unemployment or unknown occupational status, unmarried status, and psychiatric diagnosis were significantly associated with infectious disease status, suggesting that both social vulnerability and clinical characteristics may contribute to infection risk.

Based on these findings, we developed a seamless care model integrating mobile outreach, early screening, electronic health records, rapid referral, standardized treatment, health education,

psychosocial rehabilitation, and multi-agency collaboration. This model provides a practical framework for improving care continuity, strengthening infectious disease prevention and control, and supporting social reintegration among homeless individuals with mental illness. Future multicenter, longitudinal, and implementation studies are needed to validate the effectiveness, feasibility, and scalability of this model in diverse healthcare and social welfare settings.

Abbreviations

AnningHIV/AIDS

Human Immunodeficiency Virus / Acquired Immunodeficiency Syndrome

CI

Confidence Interval

OR

Odds Ratio

SD

Standard Deviation

SPSS

Statistical Package for the Social Sciences

CNKI

China National Knowledge Infrastructure

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the institutional review board of Hainan Provincial Anning Hospital. Written informed consent was obtained from all participants or, when appropriate, from their legal guardians or authorized representatives.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available due to institutional and ethical regulations concerning vulnerable populations but are available from the corresponding author upon reasonable request and approval from the ethics committee.

Competing Interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Authors' contributions

Linli Feng and Xiaoling Cheng contributed equally to this work as co-first authors. Both authors participated in the study conception and design, data collection, analysis and interpretation of results, and manuscript drafting and revision. Both authors read and approved the final manuscript.

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Figures

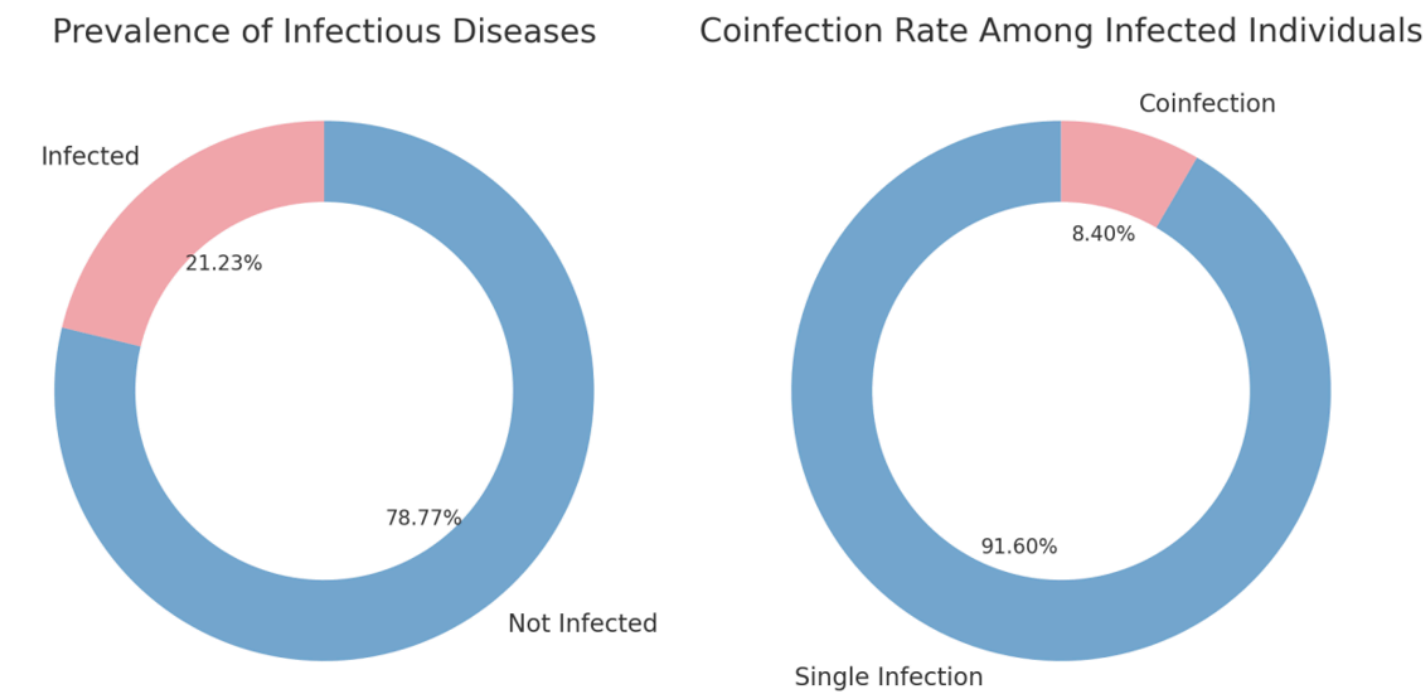


Figure 1

Prevalence of infectious diseases and patterns of co-infection among homeless individuals with mental illness.

Left: Proportion of individuals infected with at least one transmissible disease (21.23%).Right: Among infected individuals (n = 131), 91.6% had a single infection and 8.4% had coinfections.

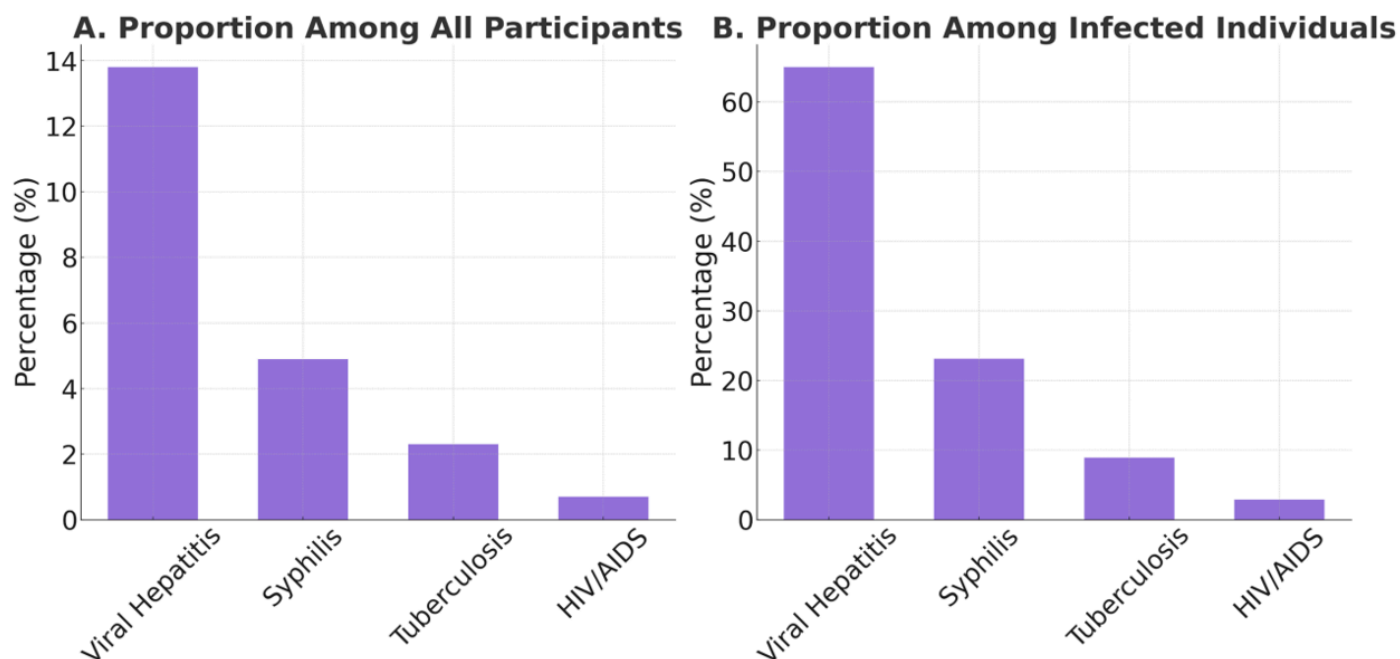


Figure 2

Distribution of infectious disease types among homeless individuals with mental illness.

(A) Proportion of each infectious disease among the total study population.(B) Proportion of each disease among infected individuals. Viral hepatitis was the most prevalent condition in both comparisons.

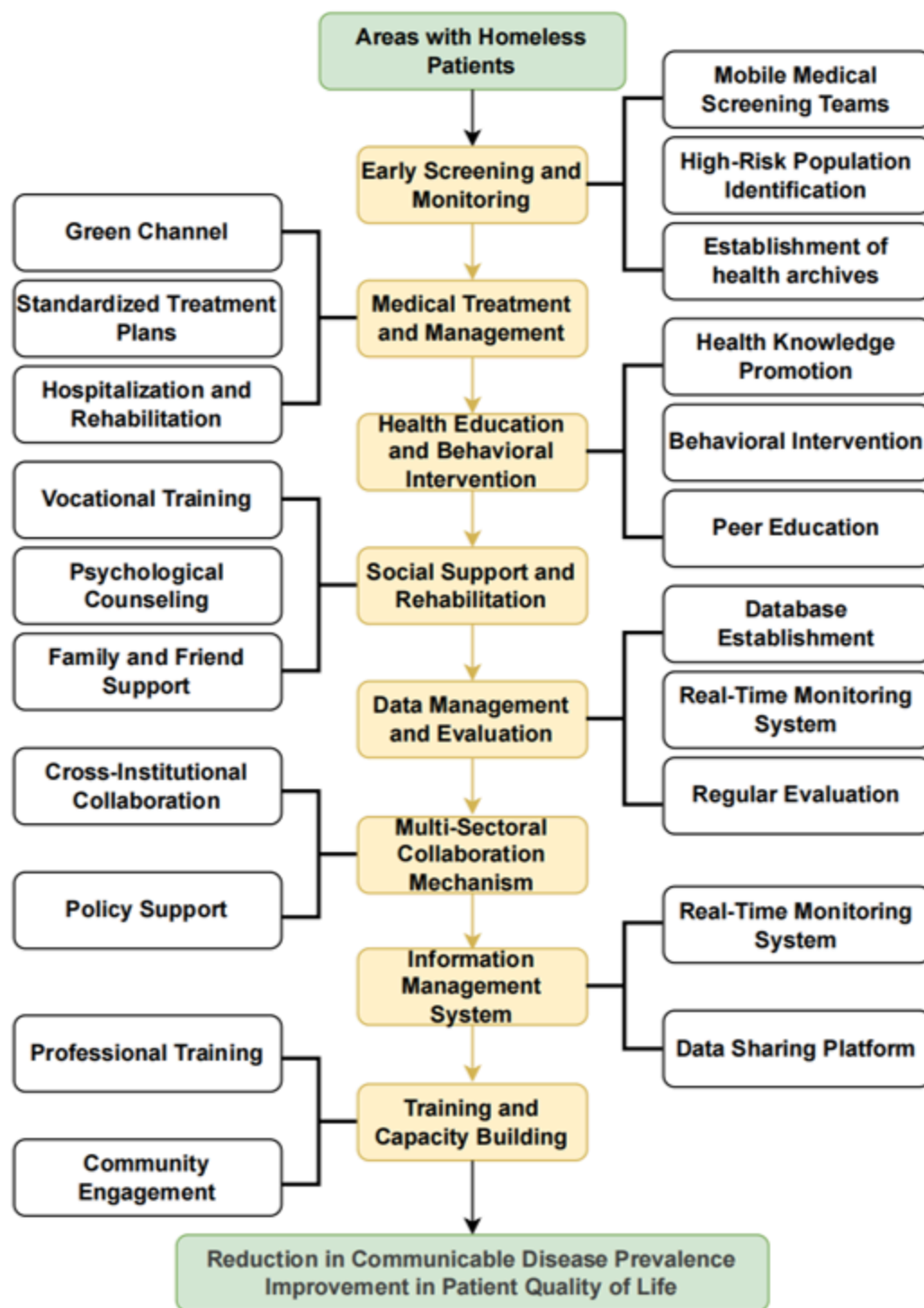


Figure 3

Proposed seamless care model for infectious disease management among homeless individuals with mental illness.

This flowchart illustrates a comprehensive, multi-level strategy for managing infectious diseases among homeless individuals with mental illness. The model begins with interventions in concentrated homeless areas and incorporates early screening, medical management, health education, social support, data

monitoring, interdepartmental coordination, and capacity building. The left and right columns indicate specific institutional and community-level measures supporting each core component. The ultimate goal is to reduce infection rates and improve quality of life.