East African Scholars Journal of Medical Sciences
Abbreviated Key Title: East African Scholars J Med Sci
ISSN: 2617-4421 (Print) & ISSN: 2617-7188 (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-7 | Issue-10 | Oct-2024 | DOI: https://doi.org./10.36349/easms.2024.v07i10.003

Review Article

Review Based Study of Prevalence and Association of Social Determinants with Tuberculosis in Doda Region of Jammu and Kashmir, India

Wahied Khawar Balwan[1*], Neelam Saba[2], Irshad Ahmad Malik[3]

[1]Associate Professor, Department of Zoology, Govt. Degree College Doda, Jammu & Kashmir, India
[2]Assistant Professor, Department of Zoology, Govt. Degree College Bhaderwah, Jammu & Kashmir, India
[3]Senior Treatment Supervisor, Tuberculosis Unit Doda, Jammu & Kashmir, India

Article History
Received: 24.08.2024
Accepted: 30.09.2024
Published: 03.10.2024

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: Tuberculosis (TB) continues to rank among the world's most serious health problems caused by *Mycobacterium tuberculosis*. There are several factors which are responsible for the exposure of tuberculosis among the communities. Human immunodeficiency virus (HIV) is one of the major factors for the exposure of tuberculosis disease among the persons. Worldwide, TB is one of the leading causes of death among people living with HIV. Tuberculosis is a serious health threat, especially for the people living with HIV. The socio-economic determinants such as unemployment, malnutrition and crowding play a significant role in increasing the rate of infection. In this article, we will discuss the socio-economic determinants of tuberculosis infection and disease. The rapidly growing consensus indicates that in the low and middle income country, the tuberculosis control programs are required with the investment in tuberculosis diagnostics and treatment in addition to action on the social determinants of tuberculosis. Tuberculosis is most common among the disadvantaged group which includes the poor, ethnic minorities as well as hungry.

Keywords: Tuberculosis, *Mycobacterium Tuberculosis*, Human Immuno-Deficiency Virus, Socio-Economic Determinants, Ethnic Minorities and Malnutrition.

INTRODUCTION

Tuberculosis is an infectious communicable disease caused by *Mycobacterium tuberculosis*. It occurs due to the drugs abuse, intake of alcohol, HIV infection, overcrowding and malnutrition. HIV is one of the major factors for exposure to tuberculosis. The risk of developing tuberculosis (TB) is estimated to be between 16-27 times greater in people living with HIV than among those without HIV infection. In 2015, there were an estimated 10.4 million cases of tuberculosis disease globally, including 1.2 million [11%] among people living with HIV. Almost 60% [57%] of tuberculosis cases among people living with HIV were not diagnosed or treated, resulting in 3,90,000 tuberculosis-related deaths among people living with HIV in 2015 (World Health Organisation). The structural determinants of tuberculosis comprise the rapid urbanization and increment in the population growth. These determinants create poor housing, malnutrition and cultural, economical and geographical barriers for accessing health care. Social protection initiatives are the provision which supports the infected patients who faced chronic capabilities as a result of discrimination, illness and disability. Various programs such as cash transfer programs and microfinance initiatives are provided to a large number of people for curing the illness. Training is also provided to the people to spread awareness among the people regarding tuberculosis.

Social Determinants of Tuberculosis

Structural determinants of health are conditions that generate or reinforce social stratification in society. Social stratification in turn gives rise to an unequal distribution of the social determinants of health, including material living conditions and psychological circumstances as well as behavioral and biological risk factors. Global socioeconomic inequalities, rapid increment in the population, high levels of population mobility and rapid urbanization are the primary structural determinants of TB epidemiology. According to Adhikari *et al*., (2019), the Commission on Social Determinants of Health (CSDH), the conditions which create strong satisfaction in society are known as the structural determinants of health. The biological risk factors and unequal distribution of the social determinants of the health get rise due to the social satisfaction in society. The inequalities in the global socioeconomic and increased population give rise to the

***Corresponding Author:** Wahied Khawar Balwan
Associate Professor, Department of Zoology, Govt. Degree College Doda, Jammu & Kashmir, India

unequal distribution of the tuberculosis determinants which includes poor housing, malnutrition, food insecurity and cultural, geographic and financial barriers to healthcare access. These social determinants are reflected through the distribution of tuberculosis which affects the four stages of TB pathogenesis which includes exposure to infection, progression to disease, inappropriate diagnosis or late treatment and poor treatment.

These determinants act as the major risk factors for tuberculosis such as overcrowding in-home and poor ventilation, malnutrition, poverty and hunger also increase the chances of this infection. According to Basta and Sousa (2019), the infected person with tuberculosis faced difficulties at the socioeconomic levels as they are not allowed to easily contact the health system. The lack of these contacts become reasons for not getting the proper diagnosis and includes difficulties in transport to the health system. For improving the treatment adherence of patients, DOTS has developed the use of the patient's social network as well as highlights how social determinant's framework lacks hope for the future. HIV and TB are closely related to each other in many settings due to which the social determinants and key structure of HIV act as indirect determinants of TB risk.

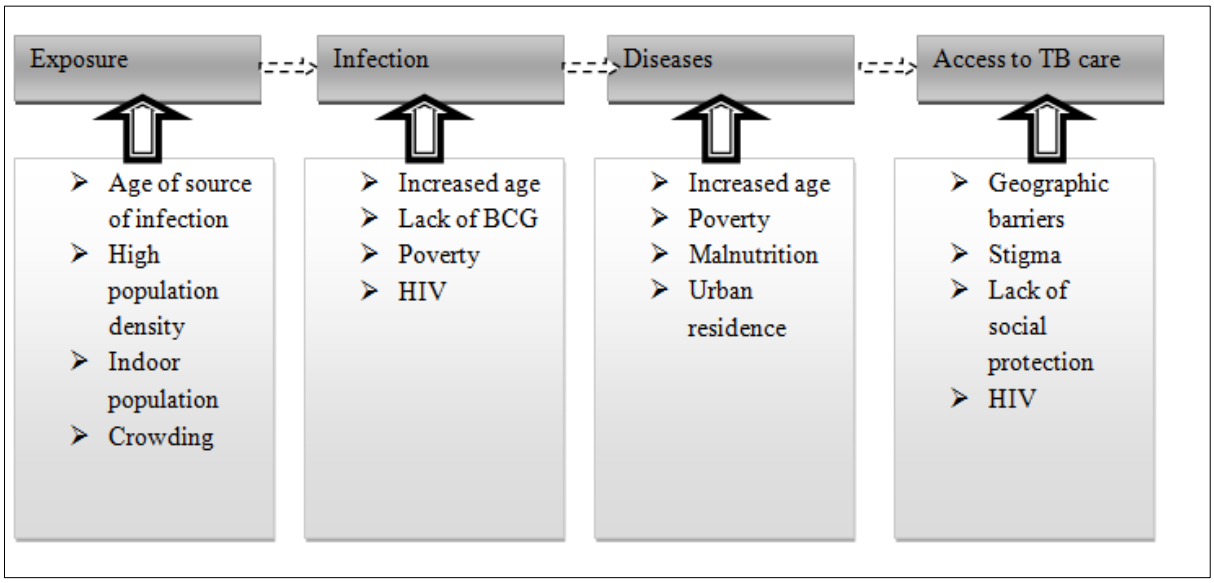

Figure 1: Risk factors for different stages of TB pathogenesis and epidemiology
Source: Bhargava *et al*., 2020, p.646

Recent Interest in Social Determinants of Tuberculosis

The tuberculosis sector simulates the social determinants of TB as the focus is increased both within and beyond the Tb sector for addressing the social determinants of TB. According to Bonadonna *et al*., (2017), the inequitable distribution of the social determinants throughout the world and the number of tuberculosis is increased through the key driver. The infection of tuberculosis is mostly seen among the disadvantaged groups which include poor and hungry people and the ethnic minorities. DOTS are used to emphasize the early detection of tuberculosis and acts as a central pillar among the patients and tuberculosis. The morbidity and mortality rates of TB have been reduced through the Direct Observed Therapy (DOT). The socioeconomic determinants of the tuberculosis are closely related to the national Tb incidence rates such as access to water sanitation, human development index and child mortality. According to Butkus *et al*., (2020), tuberculosis is a communicable disease and it is simulated through increasing awareness about the importance of social determinants of tuberculosis.

Addressing the Social Determinants of Tuberculosis

The strengthening interventions, urban regeneration and social protection strengthening can address the social determinants of tuberculosis. The disadvantaged groups such as the poor, chronic poverty and malnutrition getting groups are faced with the problem of tuberculosis. Food insecurity, poverty and malnutrition are further exacerbated through the illness caused by tuberculosis. Providing proper food to these specific groups as well as reducing poverty can reduce the chances of these infected diseases. According to Cormier *et al*., (2019), the mitigation of the impact of economic shocks such as loss of employment, illness and help to the infected people who are suffering from the chronic disease as a result of illness, disability or discrimination or age for securing the basic livelihoods and vulnerability to poverty can be reduced by the social protection initiatives. For protecting the poor countries the social protection emerged owing to growing financial and political support from the government of poor countries.

The poverty reduction investment in nutrition, health and education for children are the part of the impetus for social protection which later perpetuates intergenerational cycles of poverty. Social protection initiatives protect and build the financial, and physical human assets and also enables households to move structurally out of poverty and have a major contribution to the long term productivity in the economic growth of the country. According to De Castro 3 *et al*., (2018), the major components of the social protection includes increment in the opportunities of microfinance for supporting the business development and providing direct transfers of money or food to the disadvantaged group such as poor people or ethnic minorities, sometimes there is conditional on other actions with transferring these receipt. For maximizing these effects, parallel training activities are performed with both the components.

In some of the countries which include sub-Saharan Africa and Latin America, broader groups of people are benefited from the cash transfer programs. The programs include the children's health, emerging nutrition from a diverse range of settings and education. This scheme also provided money to the disadvantaged background who met certain behavioural requirements. According to Dehaghani *et al*., (2018), the government-led programs consist of sending poor children to school as well as providing health services for immunization, prenatal checkups and growth monitoring. The cash transfer programs ensure short-term assistance and long term human capital development. Reducing the vulnerability to the economic shocks as well as increasing the household consumption, improving the quality of food and providing security, improvement in the health outcomes, as well as the increment participation in the health services, are demonstrated through the conditional cash transfer programs.

There is a complementary approach provided through the microfinance initiatives for providing social protection to the disadvantaged group. According to Diefenbach *et al.*, (2017), these initiatives are also provided through the non-governmental sector. This initiative acts as a powerful tool for the poor as it provides them with access to improving their opportunities for engaging in productive activities. The creation of the neighborhood based association for women get loans through the various microfinance initiatives delivered. Training plays an important role and supports human capital development as well as skill development towards productive activities. These kinds of programs provide seeds, fertilizers and training to the disadvantaged people who are infected through tuberculosis. It will help them to maintain their kitchen garden. Various microfinance programs act as mentors which provide support to the productive use of loans as well as provide business development training.

According to Diefenbach *et al*., (2017), in the training, the clients get information regarding the health matters which includes malnutrition, contraceptive uses, intimate partner violence, child care, HIV prevention and breastfeeding practices. Cash transfer, training and microcredit are acts as social protection strategies can be harnessed while improving the mitigation as well as prevention of tuberculosis in four ways. These kinds of programs should be accepted at a more wide range in the disadvantages sector which includes the communities with a high level of tuberculosis. It will help to reduce the financial barriers for the diagnosis experienced by the infected person as well as increase the household's material conditions. These programs encourage the community to action regarding this disease and provide education and spread awareness regarding this disease in the program. According to Gupta *et al*., (2018), participation in these programs should be mandatory for all the patients as well as it should be voluntary. For the information dissemination and outreach, benefit distribution points are chosen for use as a site for the program.

The tuberculosis patients as well as the close contacts of the patients are targeted through the intervention. The close contacts of the patients can be at risk as they can get directly infected through tuberculosis patients. TB patients can benefit from these programs as they get cash transfers for the treatment as well as for the other relevant health behaviours such as smoking stopping. The diagnosed TB patients also get the cash transfer for supporting the goals such as latent TB infection diagnosis or sputum sample collection and successful provision of medication to children. These should be reduced to the associated morbidity with the index case. According to Huddart *et al*., (2018), Training and business development are provided to the patients suffering from tuberculosis. The opportunities and the longer-term development aims are provided as a support to the business development and training. This training is also provided to the people who are in close contact with the tuberculosis patients and are not suffering from the disease.

Further incentives are created through this provision for maximizing the treatment adherence and providing strength to the longer-term livelihood. These are also beneficial during the more rapid case finding in the communities as well as having fear regarding the costs associated with the tuberculosis diagnosis. These fears are eliminated through these programs by spreading awareness among the communities and an incentive to get diagnosed and treated quickly at the first stage. According to Imtiaz *et al.*, (2017), social protection programs also increase confidence and a stronger voice for influencing the political decisions about tuberculosis care rights as well as tuberculosis care-related education. Social protection initiatives are complex to adapt to supporting TB. Various potential problems can arise due to the direct targeting of tuberculosis patients. Cash

transfer interventions only reached the poor background people, not all the people get benefited through these programs.

Risk factors of TB Infection, Disease and Treatment Default

Tuberculosis is an infectious communicable disease and all the stages of TB pathogenesis can be effected through the socioeconomic status. According to Oliosi *et al*., (2019), it is a communicable disease as there is a major risk of exposure to this disease in the surrounding and infecting other people. The people who are working in highly crowded places as well as living in the more crowded can easily be affected by this disease. The airflow, number of people sharing the same surroundings and the characteristics of the environment are the factors for the higher risk of exposure. Increment in the Mycobacterium tuberculosis (MTB) relates with the comorbidities Leki silicosis, diabetes, infection with human infection virus (HIV), and other chronic illnesses and it also includes intake of alcohol or tobacco as well as malnutrition.

According to Ou *et al*., (2018), in a study, it is found that the people who are infected through malnutrition are 27%, HIV 19%, alcohol use of 13% as well as through smoking 23%. The charges for the health care associated with the TV can be paid directly at the health care centre or from the indirect costs of the visit. The indirect cost comprises money spent on transportation, loss of work due to illness as well as the co-payments for the medication. These all act as an economic barrier for the patient to get a cure for tuberculosis as well as get a delay in connecting with the health system were diagnosed in performed. Taking anti-tuberculosis drugs for at least six months can involve the successful treatment of tuberculosis. Alcohol abuse, low income and HIV co-infections are the major factors for tuberculosis.

The Connection between Tuberculosis and Socioeconomic Status

The lacking of social and economic necessities are known as socioeconomic deprivation. The socioeconomic deprivation includes the low income of the person, unemployment, lack of education and overcrowding. According to Pelissari and Diaz (2017), the conditions in which the people are living as well as the structural determinants of tuberculosis are responsible for increasing the risk of tuberculosis. The poor living conditions, under-nutrition and overcrowding are increased due to socioeconomic deprivation. The malnutrition and the improperly balanced diet increase the risk of the exposure of the tuberculosis case and increase the risk of bad treatment outcome as well as increased vulnerability to the disease. The impact of poverty on tuberculosis representing the multiple determinants' effect is indicated through the multivariate models through the inclusion of more proximal determinants.

The patients who are homeless have more chances to get affected through tuberculosis and have a lower treatment success rate. In the research, it is found that these are patients who consume more drugs or they are infected through HIV co-infection. Overcrowding is the major risk factor for the exposure of tuberculosis among the surroundings. According to Saunders and Evans (2020), the poor ventilation in the housing and the quality of indoor air are responsible for the exposure of tuberculosis. Malnutrition is responsible for tuberculosis as at the time of diagnosis, there is a high risk of the patient's death due to poor nutrition. Migration is also responsible for the exposure of tuberculosis especially among the migrants originating from the high burden countries. The drugs users have a high chance of getting tuberculosis due to the risky behaviours which include HIV infection, imprisonment, deprivation and homelessness and malnutrition.

Prevalence of Tuberculosis in India

Recently, the Ministry of Health and Family Welfare released the India TB Report 2024, which highlights that the mortality rate due to Tuberculosis (TB) had declined from 28 per lakh population in 2015 to 23 per lakh population in 2022. As per Annual India TB Report 2024, India has achieved a significant 16% decline in tuberculosis (TB) incidence from 2015 to 2022, surpassing the global decline of 9%. The National TB Elimination Programme, India TB Report 2024, reveals that 25.55 lakh cases of TB were notified last year, representing the highest number of cases since the launch of the National Tuberculosis Elimination Programme (NTEP) in the 1960s. Uttar Pradesh recorded the highest number of TB case notifications compared to the previous year. Bihar was the second-highest state in terms of TB case notifications. Over 8.4 lakh cases were from the private sector. There was a 1.17% increase in TB case notifications from the private sector compared to 2022. India achieved a rate of approximately 179 cases per lakh population in 2023. The programme diagnosed 63,939 cases of multidrug-resistant TB (MDR-TB), highlighting its commitment to addressing drug resistance. In 2023, more than 20.5 crore individuals were screened for signs and symptoms suggestive of TB as part of active case-finding efforts. Out of the total TB cases notified in 2023, 60.7% were men, 39.2% women, and 0.04% transgender. Despite setting ambitious goals to eliminate tuberculosis by 2025**,** India has faced challenges in meeting these targets. The number of cases and deaths recorded in 2023 fell short of the targets set by the country. There are various risk factors that contribute to the incidence and treatment outcomes of tuberculosis. These include Undernourishment, HIV, Diabetes, Alcohol Use, and smoking (Balwan and Saba, 2021).

1. Undernourishment:

Nearly **7**.44 lakh TB patients were undernourished in 2022. To improve nutrition, the government provides monthly support of Rs 500 to

nearly one crore beneficiaries. Other than that, the Nikshay Mitra programme calls for the donation of food baskets.

2. HIV:

People living with HIV have a 20-times higher risk of developing symptoms of TB as compared to the normal population. Altogether 94,000 TB patients in 2022 had HIV.

3. Diabetes:

Of the 3.70 lakh TB patients with diabetes globally in 2022**,** 1.02 lakh were in India as per estimates. Diabetes escalates the likelihood of contracting TB two-to-threefold, which in turn is linked to increased risk of Multi-Drug Resistant TB. The TB treatment also does not work as well in diabetics. Nearly 92% of TB patients were screened for diabetes in 2023, with 7.7% being diagnosed with it. And, nearly 63% of those diagnosed initiated diabetes treatment as per the report.

4. Alcohol and Tobacco Use:

A daily intake of more than 50 ml of alcohol increases the risk of TB infection, active infection and recurrence of infection. Around 18.8 lakh or 74% of TB patients underwent alcohol use screening**,** out of which 7.1% were identified as alcohol users. In 2023, around 19.1 lakh or 75% of TB patients were screened for tobacco use, of whom 11% were identified as tobacco users. And 32% of these people were linked to tobacco cessation services.

Prevalence of Tuberculosis in Doda Region of Jammu & Kashmir India

Tuberculosis a **bacterial infection,** can practically affect any organ of the body. The most common ones are the lungs, pleura (lining around the lungs), lymph nodes, intestines, spine, and brain. From the four year survey report (from 2017 to 2020) of Doda region (Chenab Valley) of Jammu and Kashmir, India, following results were obtained from Tuberculosis Unit Doda, Jammu and Kashmir (Table 1) (Balwan and Saba, 2020).

Table 1: NIKSHAY Report for the Year 2017, 2018, 2019, 2020 from Doda Region of Jammu and Kashmir, India

S.No.		2017	2018	2019	2020
	Total Patients Notified	179	204	231	146
1.	Cured	89	100	107	69
2.	Treatment completed	79	93	114	69
3.	Died	02	03	05	10
4.	Lost to Follow up (Defaulter)	04	06	01	0
5.	Treatment Failure	02	01	01	0
6.	Regimen Changed	02	01	01	04
7.	Not Evaluated	01	0	02	0
8.	Total	179	204	231	146

A survey of different regions (Tehsils) of District Doda of Jammu and Kashmir was carried out in association with Tuberculosis Unit Doda, Jammu and Kashmir for last four years from 2021 to 2024 and number of tuberculosis cases were reported (Table 2).

Table 2: Tuberculosis cases reported from different regions of Doda district of Jammu & Kashmir.

Regions in Doda	2021	2022	2023	2024
Doda	245	235	296	213
Assar	08	03	11	14
Thatri	39	52	38	60
Bhaderwah	57	58	35	55
Gundoh	60	57	47	56

CONCLUSION

From this study, it is concluded that exposure to tuberculosis is determined by the socioeconomic determinants. Socioeconomic determinants play an important role in the higher exposure of tuberculosis among the people. The socioeconomic status of the people has an adverse effect due to tuberculosis. For enabling the patients affected by tuberculosis there is a need for social interventions to access care and adhere to treatment. Training, microfinance initiatives and cash transfer programs are the social protection initiatives which are provided to the patients in support to get a cure for tuberculosis. HIV is one of the major factors responsible for exposure to tuberculosis. Migration, overcrowding, intake of drugs are highly risky for the exposure of tuberculosis. Reduction in poverty as well as providing good nutrients food can eliminate the chances of tuberculosis among the people. Providing housing with proper ventilation can also help in reducing the chances of tuberculosis.

Conflict of Interest: Authors declare that they have no conflict of interest.

REFERENCES

- Adhikari, N., Joshi, L. R., Subedi, B., Acharya, D., Adhikari, M., Thapa, P., ... & Karki, K. B. (2019). Tuberculosis in Nepal: situation, challenges and ways forward. *SAARC Journal of Tuberculosis, Lung Diseases and HIV/AIDS*, *17*(1), 34-40.
- Annual India TB Report 2024. ANNUAL INDIA TB REPORT 2024 (ensureias.com).
- Balwan, W. K., & Saba, N. (2020). Association of Social Determinants with Tuberculosis. *Journal of Natural Remedies*, *21*(7), (S1).
- Balwan, W. K., & Saba, N. (2021). Quantifying the risk of premature death in tuberculosis survivors. *The Journal of Oriental Research Madras*, *12*(2).
- Basta, P. C., & de Sousa Viana, P. V. (2019). Determinants of tuberculosis in Indigenous people worldwide. *The Lancet Global Health*, *7*(1), e6-e7.
- Bhargava, A., Bhargava, M., & Juneja, A. (2020). Social determinants of tuberculosis: context, framework, and the way forward to ending TB in India. *Expert Review of Respiratory Medicine*, 1-17.
- Bonadonna, L. V., Saunders, M. J., Zegarra, R., Evans, C., Alegria-Flores, K., & Guio, H. (2017). Why wait? The social determinants underlying tuberculosis diagnostic delay. *PloS one*, *12*(9), e0185018.
- Butkus, R., Rapp, K., Cooney, T. G., Engel, L. S., & Health and Public Policy Committee of the American College of Physicians*. (2020). Envisioning a better US health care system for all: reducing barriers to care and addressing social determinants of health. *Annals of internal medicine*, *172*(2_Supplement), S50-S59.
- Cormier, M., Schwartzman, K., N'Diaye, D. S., Boone, C. E., Dos Santos, A. M., Gaspar, J., ... & Oxlade, O. (2019). Proximate determinants of tuberculosis in Indigenous peoples worldwide: a systematic review. *The Lancet Global Health*, *7*(1), e68-e80.
- de Castro, D. B., de Seixas Maciel, E. M. G., Sadahiro, M., Pinto, R. C., de Albuquerque, B. C., & Braga, J. U. (2018). Tuberculosis incidence inequalities and its social determinants in Manaus from 2007 to 2016. *International journal for equity in health*, *17*, 1-10.
- Dehghani, K., Lan, Z., Li, P., Michelsen, S. W., Waites, S., Benedetti, A., ... & Menzies, D. (2018). Determinants of tuberculosis trends in six Indigenous populations of the USA, Canada, and Greenland from 1960 to 2014: a population-based study. *The Lancet Public Health*, *3*(3), e133-e142.
- Diefenbach-Elstob, T., Plummer, D., Dowi, R., Wamagi, S., Gula, B., Siwaeya, K., ... & Warner, J. (2017). The social determinants of tuberculosis treatment adherence in a remote region of Papua New Guinea. *BMC public health*, *17*, 1-12.
- Dos Santos, D. T., Arroyo, L. H., Alves, Y. M., Alves, L. S., Berra, T. Z., Crispim, J. D. A., ... & Nunes, C. (2021). Survival time among patients who were diagnosed with tuberculosis, the precocious deaths and associated factors in southern Brazil. *Tropical Medicine and Health*, *49*, 1-14.
- Gupta, D., Ariyarathne, K., Refai, A. C., & Rathnayake, S. (2018). *Confronting Health Communication Challenges Addressing Tuberculosis in Sri Lanka*: Synopsis.
- Huddart, S., Nafade, V., & Pai, M. (2018). Tuberculosis: A persistent health challenge for India. *Current Epidemiology Reports*, *5*, 18-23.
- Imtiaz, S., Shield, K. D., Roerecke, M., Samokhvalov, A. V., Lönnroth, K., & Rehm, J. (2017). Alcohol consumption as a risk factor for tuberculosis: meta-analyses and burden of disease. *European Respiratory Journal*, *50*(1).
- Oliosi, J. G. N., Reis-Santos, B., Locatelli, R. L., Sales, C. M. M., da Silva Filho, W. G., da Silva, K. C., ... & Maciel, E. L. N. (2019). Effect of the Bolsa Familia Programme on the outcome of tuberculosis treatment: a prospective cohort study. *The Lancet global health*, *7*(2), e219-e226.
- Ou, Y., Luo, Z., Mou, J., Ming, H., Wang, X., Yan, S., & Tan, A. (2018). Knowledge and determinants regarding tuberculosis among medical students in Hunan, China: a cross-sectional study. *BMC public health*, *18*, 1-7.
- Pelissari, D. M., & Diaz-Quijano, F. A. (2017). Household crowding as a potential mediator of socioeconomic determinants of tuberculosis incidence in Brazil. *PLoS One*, *12*(4), e0176116.
- Saunders, M. J., & Evans, C. A. (2020). COVID-19, tuberculosis and poverty: preventing a perfect storm. *European Respiratory Journal*, *56*(1).
- Shelby, T., Meyer, A. J., Ochom, E., Turimumahoro, P., Babirye, D., Katamba, A., ... & Armstrong-Hough, M. (2018). Social determinants of tuberculosis evaluation among household contacts: a secondary analysis. *Public Health Action*, *8*(3), 118-123.
- Trauer, J. M., Dodd, P. J., Gomes, M. G. M., Gomez, G. B., Houben, R. M., McBryde, E. S., ... & Dowdy, D. W. (2019). The importance of heterogeneity to the epidemiology of tuberculosis. *Clinical infectious diseases*, *69*(1), 159-166.
- Wardani, D. S. R. (2018). Social Determinants and Risk Factors for Tuberculosis Patients: A Case Control Study at Health Services Applying Directly Observed Treatment Shortcourse (DOTS) in Bandar Lampung, Indonesia. *KnE Life Sciences*, 522-531.

Cite This Article: Wahied Khawar Balwan, Neelam Saba, Irshad Ahmad Malik (2024). Review Based Study of Prevalence and Association of Social Determinants with Tuberculosis in Doda Region of Jammu and Kashmir, India. *East African Scholars J Med Sci*, *7*(10), 395-400.