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Chronic Lower Back Pain Among Women in India: Evidence-Based Approach to Risk Factors and Interventions

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Glossary
CBT – Cognitive-Behavioral Therapy
CLBP – Chronic Lower Back Pain
CP – Chronic Pain
EBI – Evidence-Based Interventions
LBP – Lower Back Pain
MSD - Musculoskeletal Disorders
NHPI – National Health Portal of India
NSAID - Nonsteroidal Anti-Inflammatory Drugs
PHC – Primary Health Care
SEM – Socio-Ecological Model
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Abstract

Chronic lower back pain (CLBP) is a prevalent issue worldwide, affecting about 1.71 billion people, with a significant proportion being women. CLBP is a major health concern in India, particularly among women, which were 80% reported experiencing this condition. Several factors, such as personal beliefs, sociocultural norms, restricted healthcare access, repetitive movements, and psychological aspects, contribute to this high prevalence leading to severe health and economic implications, including reduced work productivity and income. Although there have been several reports on prevalence and risk factors of CLBP, to our knowledge, there has not been enough work focusing on evidence-based interventions to decrease the burden of CLBP in India.

This paper applied the Socioecological model to examine the determinants of CLBP among Indian women and suggest evidence-based interventions. We reported that despite research on the prevalence and single-level risk factors of CLBP, there's a gap in analyzing the complex interactions of these risk factors and creating effective interventions to address these interactions.

CLBP constitutes a significant health burden among Indian women. Addressing chronic pain is not only a fundamental human right but also an ethical responsibility of healthcare systems. Interventions to address lower back pain should evolve from focusing on symptomatic relief to a multidimensional, patient-centered approach. These include self-management strategies, multidisciplinary care, and technological advancements like digital health solutions.
**Introduction**

Alarming statistics reveal the substantial impact of chronic pain on a global scale. It affects a significant proportion of the population, with an estimated prevalence of 20%, accounting for 15% to 20% of physician visits (Treede et al., 2008). The Global Burden of Disease analysis in 2019 demonstrated that musculoskeletal conditions, including low back pain, neck pain, fractures, osteoarthritis, and rheumatoid arthritis, affect approximately 1.71 billion people worldwide (Cieza et al., 2021).

Chronic musculoskeletal disorders, specifically chronic lower back pain (CLBP), are significant health issues for women, who experience these conditions more frequently than men (Casale et al., 2021; Sushil et al., 2023). This high prevalence can be attributed to an intricate web of factors such as personal beliefs, sociocultural norms, restricted healthcare access, repetitive movements, and psychological aspects linked to enduring pain (Till et al., 2019; Gupta et al., 2015; Das et al., 2018; Paramjot et al., 2019; Hemavati, 2014).

Research shows that the extent of CLBP among Indian women is alarmingly high, with approximately 79% of women between 20 to 50 years suffering from chronic pain. Lower back pain alone affects around 80% of women compared to 59% of men (Bang et al., 2021).

Apart from health implications, CLBP has severe economic repercussions on individuals and society at large in India. Costs linked to healthcare services, such as consultations, diagnostics, medication, and rehabilitation, add significantly to the economic strain (Shetty et al., 2022). Moreover, women afflicted with CLBP often experience reduced work productivity and income, further adding to the indirect costs of lost earnings and work absenteeism (Bang et al., 2021).
The overall financial stress due to chronic pain can severely impact household budgets and socioeconomic stability.

Recognizing the substantial influence of CLBP on the health and quality of life of women in India necessitates a comprehensive understanding of its contributing factors to formulate effective interventions. Although previous research has explored the prevalence and single-level risk factors of CLBP among women in India, those studies have not adequately analyzed the complex interactions of these factors (Priyanka, 2023). Therefore, this paper will use the Socioecological model to examine the determinants of CLBP among women in India and suggest appropriate interventions considering various levels of influence, including individual, interpersonal, community, and policy factors. This multi-layered approach could help to mitigate the burden of lower back pain, improve women's health outcomes, and contribute to their overall well-being.

**Background**

Chronic lower back pain is a prevalent health issue that significantly affects individuals worldwide (Sá et al., 2019). This condition can have debilitating effects on physical, psychological, and social well-being, leading to a reduced quality of life and functional impairment (Smith & Osborn, 2008). Characterized by pain that extends beyond the expected healing time, chronic pain poses unique challenges as it lacks the acute warning function typically associated with physiological nociception (Treede et al., 2008). Traditionally, pain is considered chronic when it persists or recurs for more than 3 to 6 months (Treede et al., 2008).

According to a systematic review and meta-analysis of global studies, the prevalence of CLBP in the general population ranges from 4.2% to 80.2% (Hoy et al., 2012). The prevalence
can vary based on factors such as age, gender, occupation, and geographical region. 619 million people globally were affected by CLBP in 2020 according to WHO and this number is expected to increase up to 823 million by year 2050 (WHO, 2023).

These conditions are also the leading contributor to years lived with disability (YLDs), accounting for 149 million YLDs globally, or 17% of all YLDs (Williams et al., 2018). Specifically, low back pain contributes significantly to the burden of musculoskeletal conditions, with 570 million prevalent cases worldwide and responsible for 7.4% of global YLDs (Hartvigsen et al., 2018.; WHO, 2019).

Additionally, CLBP is associated with psychological distress, including depression, anxiety, and reduced social functioning (Till et al., 2019; Paramjot et al., 2019). The long-lasting nature of chronic pain further contributes to decreased sleep quality, fatigue, and overall diminished health-related quality of life (Saxena et al., 2019). These health impacts highlight the urgent need for effective interventions to address CLBP among women.

Chronic lower back pain can lead to various health consequences, including physical discomfort, functional limitations, decreased mobility, and impaired daily activities (Dipika et al., 2020). Associations have been observed between chronic pain and conditions such as depression, anxiety, sleep disturbances, sexual dysfunction, and impaired quality of life (Meena et al., 2019; Verma et al., 2020). These comorbidities contribute to a cycle of pain and psychological distress, significantly affecting women's physical and mental health. Additionally, the impact of chronic pain extends beyond the individual, affecting familial relationships, work productivity, and socioeconomic stability (Chandwani et al., 2018). A comprehensive understanding of these risk factors can inform targeted interventions and policies to alleviate the burden of chronic pain among women.
Within primary healthcare settings, chronic pain is a prevalent issue, with nearly one third of patients presenting pain as their chief complaint (Sá et al., 2019). The recognition of chronic pain as a pressing global health concern is of utmost importance, as adequate pain treatment is not only a fundamental human right but also an ethical responsibility of healthcare systems. It is crucial to address this complex issue and prioritize access to effective pain management on a global scale to uphold the well-being and rights of individuals suffering from chronic pain.

**Women in India and Chronic Lower Back Pain**

The women population in India is a diverse and significant segment of the country's society. As of 2021, the estimated female population in India stood at around 662 million, accounting for approximately 48.5% of the total population (World Bank, 2021).

Chronic lower back pain (CLBP) constitutes a significant health burden among Indian women, with prevalence rates surpassing those seen in men. Current research indicates that around 79% of Indian women aged 20 to 50 years experience some form of chronic pain, with CLBP being one of the most commonly reported forms (Bang et al., 2021). Specifically, the prevalence of CLBP among women stands at around 80%, in comparison to 59% among men (Bang et al., 2021). A comprehensive meta-analysis of 97 studies examining the prevalence of lower back pain in India highlighted an even higher rate of CLBP among certain subgroups, notably women, rural populations, and elementary workers, surpassing global averages and other ethnic populations (Shetty et al., 2022). Moreover, mothers face a particularly high risk, with nearly 50% reporting moderate to severe pain, and an established positive correlation between pain intensity and parity (Saxena et al., 2019).
However, it is important to note that there are significant regional variations in the sex ratio, with some states experiencing a disproportionately lower number of females due to cultural preferences for male children (Office of the Registrar General & Census Commissioner, India, 2021).

Education is crucial for empowering women and promoting gender equality. Over the years, there has been progress in women's education in India, but gender disparities persist. According to the National Family Health Survey (NFHS-5) data, the literacy rate among women in India is lower compared to men, with significant variations across states (International Institute for Population Sciences, 2020). Initiatives like the Beti Bachao, Beti Padhao (Save the Girl Child, Educate the Girl Child) campaign have aimed to address these disparities and promote girls' education (Ministry of Women and Child Development, Government of India). Women's workforce participation in India remains relatively low. According to the World Bank (2021), the female labor force participation rate in India stood at around 20% in 2020. Various factors, including cultural norms, societal expectations, limited employment opportunities, and gender-based discrimination, contribute to this low participation rate (International Labour Organization, 2020).

Women in India face various social challenges and gender-based inequalities. Issues like gender-based violence, child marriage, dowry system, and limited decision-making power persist in many parts of the country (National Crime Records Bureau, 2020; United Nations Children's Fund, 2020). Efforts to address these challenges include legislative measures such as the Protection of Women from Domestic Violence Act and the Prohibition of Child Marriage Act, as well as awareness campaigns and empowerment initiatives (Ministry of Women and Child Development, Government of India).
Women in India face unique challenges and disparities that significantly influence their health and well-being. In Indian society, cultural norms, traditional gender roles, and limited access to resources often contribute to gender inequality and impact women's health outcomes (Mishra et al., 2009; Nagendra et al., 2018). Women's healthcare is sometimes prioritized less than men's, leading to delays in seeking treatment and inadequate access to healthcare services (Mishra et al., 2009).

Socioeconomic factors also play a crucial role in shaping women's health in India. Low socioeconomic status and educational disparities limit opportunities for women, impacting their overall health and well-being (Rao et al., 2017). 64% of the Indian population live in the rural areas as estimated by World Bank staff based on data from the United Nations Population Division's World Urbanization Prospects (World Bank, 2022.; Appendix 2). Women in rural areas face additional challenges due to limited infrastructure, lack of transportation, and cultural barriers that restrict their access to healthcare services (Venkatesan et al., 2022). These factors contribute to health disparities and hinder the timely management of health issues, including chronic conditions like lower back pain. Moreover, gender-based violence and discrimination pose significant threats to women's physical and mental health in India. Domestic violence, sexual assault, and harassment are prevalent issues that can have long-lasting consequences on women's well-being and quality of life (Nagendra et al., 2018). These experiences can lead to psychological distress, trauma, and increased vulnerability to health problems.

Given the considerable impact of CLBP on the well-being of women in India, it is essential to understand the multitude of contributing factors to develop effective interventions. Utilizing the socio-ecological model facilitates this understanding, as it allows for a
comprehensive examination of the problem at multiple levels of influence (individual, interpersonal, community, and policy), as proposed by Bronfenbrenner (1977).

**Interventions addressing Lower Back Pain**

Chronic lower back pain (CLBP) is characterized by persistent or recurrent pain in the lower back region that lasts for at least three months. It is a common musculoskeletal condition that can significantly impact an individual's quality of life and daily functioning. CLBP can range in intensity from mild to severe and may be accompanied by other symptoms such as stiffness, reduced range of motion, muscle spasms, and impaired physical function (WHO, 2019).

The history of addressing lower back pain spans several decades, with ongoing efforts to understand its causes and develop effective interventions. Early approaches to managing lower back pain focused primarily on symptomatic relief through bed rest and medication (Waddell, 2004). However, as research advanced, a shift occurred towards a more comprehensive and multidisciplinary approach.

One notable development in the management of lower back pain is the recognition of the biopsychosocial model, which considers biological, psychological, and social factors in understanding and treating the condition (Main et al., 2012). This model acknowledges the complex interplay between physical and psychosocial aspects of pain, highlighting the importance of addressing not only the physical symptoms but also the psychological and social factors that contribute to the experience of pain.

In recent years, there has been a growing emphasis on self-management strategies and patient empowerment in the management of lower back pain. Self-management programs, such as education, exercise, and behavioral techniques, have shown promising results in improving
pain outcomes and enhancing patients' ability to cope with their condition (Nicholas et al., 2019). These programs aim to empower individuals to take an active role in managing their pain and promoting self-care.

Furthermore, the use of multidisciplinary pain clinics and rehabilitation programs has gained traction in the management of chronic lower back pain. These programs involve a team of healthcare professionals, including physicians, physical therapists, psychologists, and occupational therapists, who collaborate to provide comprehensive care tailored to the individual needs of patients (Von Korff et al., 2005). This integrated approach recognizes that effective pain management requires a holistic approach that addresses the physical, psychological, and functional aspects of pain.

In recent years, technological advancements have also played a role in the management of lower back pain. Telemedicine and digital health solutions have facilitated remote consultations, delivery of interventions, and monitoring of patients' progress (Cottrell et al., 2020). These innovations have the potential to improve access to care, provide real-time support, and enhance self-management strategies for individuals with lower back pain.

Overall, the approach to addressing lower back pain has evolved from primarily focusing on symptomatic relief to adopting a multidimensional and patient-centered approach in the developed world. The incorporation of the biopsychosocial model, self-management strategies, multidisciplinary care, and technological advancements has contributed to a more comprehensive and personalized approach to managing lower back pain.
This paper attempts to provide a comprehensive analysis of the determinants of CLBP among Indian women using a socioecological model and suggesting potential interventions specifically for the female Indian population that correspond to each level of identified risk factors. This study emphasizes the substantial proportion of the population affected by chronic pain, with women being particularly vulnerable, especially regarding lower back pain. The significance of chronic lower back pain calls for comprehensive risk analysis in order to create suitable interventions that address these issues within a socioeconomic model.

**Methods**

Chronic lower back pain (CLBP) is a significant public health issue affecting women in India. Understanding the risk factors associated with CLBP and identifying suitable interventions is crucial for addressing this prevalent condition. This paper uses a qualitative approach to examine the determinants of chronic lower back pain among women in India and propose suitable interventions based on using a socioecological model.

By examining the multifaceted nature of CLBP in Indian women through the socioecological lens, this review aims to provide insights into the various levels of influence and propose comprehensive strategies to effectively tackle this public health challenge.

**Literature Search Strategy**

A comprehensive literature search was conducted to identify relevant studies on chronic lower back pain risk analysis among women in India and suitable interventions. The search was performed in electronic databases, including PubMed, Scopus, Google Scholar, WHO, World Bank, Stata web site, Indian government official web site and the Indian Journal of Pain. The following search terms were used: “chronic pain”, "chronic lower back pain," "women," "India,"
"risk factors," "prevalence," and "interventions." Boolean operators (AND, OR) were used to combine the search terms appropriately. The search was limited to articles published in English from the past 15 years (2008-2023) to ensure the inclusion of recent research. This paper includes peer-reviewed journals, official government websites, statistics websites and NGO organizations’ information.

**Study Selection**

The initial search yielded a total of approximately 150 articles. After removing duplicates, the titles and abstracts of the remaining articles were screened for relevance. Studies were included if they focused on chronic lower back pain among women in India, assessed risk factors associated with the condition, and existing interventions based on the socioecological model. Studies that primarily focused on other musculoskeletal conditions or did not provide sufficient data on chronic lower back pain were excluded. The full texts of potentially relevant articles were then reviewed for final inclusion in the literature review.

**Data Extraction and Analysis:**

Information from listed resources was analyzed and key findings related to the risk factors and interventions associated with chronic lower back pain among women in India were extracted. The socioecological model was used as a framework to categorize and analyze risk factors and interventions at multiple levels, including individual, interpersonal, community, and public policy factors.

**Socioecological Model:**

The socio-ecological model, developed by Urie Bronfenbrenner in the mid-1970s, has served as an invaluable tool in understanding health behaviors and outcomes in the context of
their social and environmental influences (Bronfenbrenner, 1977). This model emphasizes the role of five interconnected systems, namely, the individual, interpersonal, organizational, community, and policy levels, which together shape individuals' health behaviors and outcomes (McLeroy et al., 1988). The application of the socio-ecological model to chronic lower back pain (CLBP) in Indian women allows for a comprehensive understanding of the diverse factors contributing to this prevalent health concern (Appendix 1). By organizing the risk factors according to the socioecological model, this literature review emphasizes the multifaceted nature of chronic lower back pain among women in India and highlights the need for interventions targeting multiple levels of influence to effectively address this public health issue.

**Risk factors analysis for developing Chronic Lower Back Pain using Socio-Economic Model**

The socio-ecological model allows for a holistic understanding of the multi-layered risk factors contributing to CLBP among Indian women, thereby informing the development of effective preventive and intervention strategies. Based on the model, we will discuss these levels:

*Individual level*

Age has been identified as a significant factor in CLBP among women, with studies showing a higher prevalence in older age groups (Gupta et al., 2020). According to the study by Koley and Sandhu (2009), there is an association between increasing age and the risk of developing low back pain among menopausal patients in Tarn Taran, Punjab, India. The findings suggest that as age advances, there is a higher likelihood of experiencing low back pain in this
population. Research indicates that women in India may experience accelerated aging compared to their counterparts in other regions. A study by Dey and Chakraborty (2018) found that Indian women exhibited signs of advanced aging. The findings suggest that factors specific to the Indian context may contribute to accelerated aging in women, placing them at a higher risk of developing LBP as well.

Parity, or the number of pregnancies and childbirths a woman has experienced, has also been associated with CLBP. Research suggests that multiparity increases the risk of CLBP due to the physical stress placed on the lower back during pregnancy and delivery (Khalil et al., 2019). Despite recent trends showing a decrease in the number of multiple births in India, the burden on the woman's body during pregnancy still poses a risk factor for contracting lower back pain and needs to be addressed. Inequities in accessing maternal health services, particularly in rural areas, further compound the challenges faced by the female population (Dongarwar & Salihu, 2020).

Obesity plays a crucial role in CLBP among women in India, with excess weight placing additional strain on the spine. Studies have highlighted a positive correlation between obesity and CLBP (Lakshman et al., 2018). Physical inactivity, characterized by a lack of regular exercise or a sedentary lifestyle, is another contributing factor. Insufficient physical activity weakens the supporting musculature of the back, making women more susceptible to CLBP (Gupta et al., 2020). The prevalence of obesity in India, particularly among women in rural areas, is concerning (Venkatrao, 2020). The Indian National Family Health Survey-4 reported a significant increase in obesity among women aged 15 to 49 years in India, reflecting the growing burden of obesity in the country (Pradeepa et al., 2015). Psychological factors, such as stress and depression, are known to influence CLBP. High levels of chronic stress and depression can exacerbate pain perception and increase the likelihood of developing CLBP (Machado et al.,
Mental health is not addressed adequately in India due to the lack of mental health professionals, disadvantaged position of women, lack of awareness and stigma (Bohra, Srivastava, & Bhatia, 2015). The relationship between these factors and CLBP among women in India highlights the importance of addressing mental health alongside physical well-being.

**Interpersonal level**

Studies have shown that social support plays a crucial role in managing and coping with chronic pain. The absence of strong social support networks can contribute to increased vulnerability and poor outcomes for women experiencing chronic lower back pain (Palmer, Heitkemper, & Jarrett, 2019). In the context of India, where gender dynamics and roles can be distinctly marked, the relationship between social support for women and chronic pain is noteworthy. Women, especially in rural areas, often lack access to appropriate healthcare, and social stigma can prevent them from seeking help for conditions like chronic pain (Rao, K., & Finnoff, J. T., 2017). Traditional support structures such as joint families can play a role in providing instrumental and emotional support. However, these systems may also perpetuate stigmas and inhibit women from seeking external medical help. Many times, such support may be inadequate or inappropriate for managing chronic pain effectively (Bennett, M. I., et al., 2017).

Additionally, family dynamics and gender roles within Indian society can influence the experience of chronic pain among women. Cultural expectations and traditional gender roles may limit women's autonomy in seeking help, receiving appropriate treatment, and engaging in self-care practices for managing their pain (Mittal et al., 2019). The article about the risk of musculoskeletal disorders (MSDs) associated with kitchen platform tasks found that repetitive and prolonged kitchen tasks, such as cooking, washing dishes, and chopping, were significantly
associated with an increased risk of developing musculoskeletal disorders, including lower back pain, among women (Sonal et al., 2019). Statistically in India only about 11% of the urban families go out to eat or order food delivery once a week (Statista, 2023.; Appendix 3). Therefore, burden of everyday kitchen tasks falls mostly on women putting them at higher risk of developing MSD.

Socio-cultural factors also contribute to the prevalence of LBP among women in India. Gender roles and societal expectations often place a burden on women to perform household chores and caregiving responsibilities without adequate support or assistance (Gupta et al., 2015). This can lead to prolonged periods of physical strain and repetitive movements, increasing the risk of LBP. Cultural norms may discourage women from seeking medical help or expressing their pain, further exacerbating the problem (Till et al., 2019).

Moreover, Gender-based issues in India, including domestic violence, persist as significant challenges that impact the well-being and rights of women. These issues are rooted in deep-seated gender inequalities, cultural norms, and social structures. Domestic violence, in particular, has detrimental effects on women's physical, mental, and emotional health, and is a violation of their human rights.

Domestic violence refers to any form of violence, including physical, sexual, emotional, or economic abuse, that occurs within the context of an intimate or family relationship. In India, domestic violence remains alarmingly prevalent. According to the National Family Health Survey (NFHS-5) data, around 30% of ever-married women aged 15-49 have experienced some form of spousal violence (International Institute for Population Sciences, 2020.; Appendix 4). Additionally, the COVID-19 pandemic has further exacerbated the issue, with reports of
increased instances of domestic violence during lockdown periods (United Nations Women, 2020).

The causes of domestic violence in India are complex and multifaceted. Deep-rooted gender inequalities, patriarchal norms, and cultural beliefs that perpetuate male dominance and control contribute to the prevalence of domestic violence (Kishor, 2004). Economic factors, such as women's limited financial independence and dependence on their partners, can also contribute to the perpetuation of violence (Jejeebhoy, 1998).

Challenges connected to domestic violence farther exaggerate health issues affecting women from mental and physical sides and prevent women from seeking medical help feared to be abused.

It is imperative to challenge gender norms, promote gender equality, and provide comprehensive support to survivors of domestic violence to ensure the well-being and rights of women in India.

**Community Level**

Occupational hazards and workplace conditions can significantly contribute to the development of chronic lower back pain, especially in developing countries like India where labor laws and work safety regulations may not be as strictly enforced as in developed countries. Jobs involving heavy physical labor, repetitive tasks, and prolonged sitting or standing are particularly risky (Bernard, 1997). In India, many women are involved in these types of work, including agriculture, construction, and in the informal economy, where working conditions are often unregulated and precarious.

Agricultural work, a significant employer of women in rural India, often involves repetitive, strenuous tasks such as bending, lifting heavy loads, and long hours of work, which
are known risk factors for lower back pain (Gupta, et al., 2015). Overall rural women in India stand for 75.7% of agricultural workers in India according to the recent report by the Ministry of Statistics & Programme Implementation (2023). Accordingly, it is a major number of women who suffer from job-related psychological and physical problems as discussed above. Such as, rice farmers in West Bengal India report increased number of lower back pain due to monotony in work, awkward working positions, lifting, pulling loads (Das, 2022. Similarly, women working in construction, another major employment sector, face similar physical demands, as well as the added risk of accidents due to inadequate safety measures (Dong, et al., 2017., Gangopadhyay, at al., 2015). For example, the study in India among female brick field workers revealed results of 70% women suffering from LBP due to manual material handling (45%) and due to unsafe lifting objects like bricks (Das, 2017).

Women working in the informal economy, such as domestic work or home-based piecework, may face poor ergonomic conditions, lack of breaks, and psychosocial stressors, all of which can contribute to chronic lower back pain (Das, 2017). Work-related psychosocial stressors, such as job dissatisfaction, high job demands, and low decision latitude, are also associated with lower back pain (Das, 2017, Gangopadhyay, at al., 2015). These factors may be particularly relevant in the Indian context, where gender inequality can result in higher levels of job-related stress for women.

When chronic pain is already exists women again face multiple challenges to seek help while insurance in India has specific limitations for females. First of all workers typically lack access to healthcare services and benefits, compounding the problem. 83% of rural housewife’s reported LBP in the study in Kanpur, India (Gupta & Nnandini, 2015). These women have a significant impact of social burden due to their LBP.
India's healthcare structure overall consists of a three-tiered system comprising primary, secondary, and tertiary levels of care. At the primary level, primary health centers (PHCs) and sub-centers serve as the first point of contact for healthcare services. The health insurance sector has expanded significantly, with various insurers offering individual and group health insurance policies (IRDAI, 2021). However, there are challenges in terms of the availability of skilled healthcare professionals, inadequate infrastructure, and uneven distribution of healthcare facilities, particularly in rural areas (Ministry of Health and Family Welfare, Government of India, 2019). These limitations impact women's access to primary healthcare services creating significant challenges for healthcare access.

Specifically, women in India face multiple barriers to accessing healthcare services. These include cultural norms, limited financial resources, lack of transportation, gender-based discrimination, and low awareness of available services (International Institute for Population Sciences, 2020). These barriers can significantly impact women's ability to seek timely and appropriate healthcare, resulting in delayed diagnoses, limited preventive care, and poorer health outcomes. Moreover, certain women-specific health needs may not always receive adequate coverage. For example, maternity-related expenses, such as prenatal care, delivery, and postnatal care, may have limited coverage or specific waiting periods before becoming eligible (Gupta & Indrayan, 2018). Additionally, health insurance in India is the practice of gender-based pricing, where women may be charged higher premiums compared to men. This pricing disparity is often based on actuarial considerations related to women's higher utilization of healthcare services, including maternity-related expenses (Gupta & Indrayan, 2018). The gender-based pricing can make health insurance premiums more expensive for women, potentially limiting affordability and access to coverage.
Health insurance policies also impose exclusions or waiting periods for pre-existing conditions. Some women-specific conditions, such as breast cancer, cervical cancer, reproductive disorders or chronic pain, including LBP may be considered pre-existing conditions and may have waiting periods before coverage kicks in which discourage women to seek medical help and expand struggling period (Gupta & Indrayan, 2018).

Finally, health insurance policies often do not fully cover preventive services, requiring women to bear the cost out of pocket (Gupta & Indrayan, 2018). Preventive care, such as regular health check-ups, screenings, and vaccinations, is crucial for maintaining women's health and preventing future complications.

*Public Policy Level*

India's healthcare system, while extensive, is fraught with barriers that particularly impact women's access to healthcare services, among which chronic conditions like lower back pain are a major concern. Notably, the lack of gender-sensitive policies stands out as a fundamental issue. Chronic lower back pain, which is closely associated with strenuous labor, pregnancy, and childbirth, disproportionately affects women. Despite this, the healthcare policies in India often overlook the specific health needs of women, thereby creating a disconnect in the provision of effective treatment and prevention efforts for conditions like lower back pain (George, A., 2008). Exacerbating this situation is the shortfall in healthcare infrastructure. Particularly in rural areas, where most of the far women who do farmer work live the healthcare system lacks the necessary amenities and specialist services, such as orthopedic consultations, that are crucial in managing lower back pain (Rao, M., et al., 2011). Affordability presents another significant challenge. While there have been strides to improve accessibility to affordable healthcare, out-of-pocket
expenses persist as a substantial hurdle. Statistics show that rate of women living in poverty is significantly higher than the same among men (Kanwal, 2022). This is 45.3 million women compared to 37.77 million men live in poverty in India (Appendix 5). For women suffering from chronic conditions like lower back pain, this barrier is all the more prominent due to the need for ongoing treatment, physiotherapy, and medications (Balarajan, Y., et al., 2011).

Furthermore, the existing health insurance policies often fall short in meeting the needs of women. Often, the coverage for treatments and therapies necessary for managing chronic conditions, such as lower back pain, are insufficient. This gap in the system places a substantial financial burden on women who are seeking the required treatments (La Forgia, G., & Nagpal, S., 2012). Notably, the proportion of women in national parliament is significantly low, which also affect decisions on female health sensitive policies (World Bank, 2022.; Appendix 6).

Lastly, the lack of adequate education and awareness plays a crucial role. Without appropriate policies and programs that raise awareness about health issues and available services, particularly targeting women in rural or marginalized communities, the timely diagnosis and treatment of conditions like lower back pain become even more difficult (Scott, K., et al., 2018). Often women are no aware of the condition like chronic pain can be treated and just learn how to live with it (Scott, K., et al., 2018). Additionally, not only access to education but specific knowledge about the condition is not adequate among the Indian women. Study among college student showed that majority of participants had false believes in the domains about CLBP (Suhail et al., 2021).

In essence, policy-level barriers pose significant challenges to women's access to healthcare in India, notably influencing the management and treatment of conditions like chronic lower back pain. Addressing these barriers necessitates a holistic, gender-sensitive, and inclusive
approach to policymaking. Efforts to address these disparities and provide equal educational opportunities for all women remain crucial for achieving sustainable programs to address CLBP among women in India.

**Intervention approach addressing CLBP**

*History*

Over the years, the development of interventions for chronic lower back pain (CLBP) has undergone a significant transformation, reflecting a growing understanding of the complexity of this condition. Initially, the focus was primarily on biomedical approaches such as medication, injections, and surgeries (Chou et al., 2017). While these interventions aimed to alleviate pain and restore functionality, their effectiveness in providing long-term relief was often limited.

As research advanced, it became evident that CLBP is influenced by various factors, including physical, psychological, and social aspects. This led to a shift towards a more holistic approach in addressing CLBP. Physical therapy and exercise emerged as crucial components of CLBP management, focusing on improving strength, flexibility, and posture while reducing pain and disability (Oliveira et al., 2012). These interventions encompassed a wide range of exercises, including aerobic activities, strengthening exercises, and mind-body practices like yoga and tai chi.

Alongside physical interventions, cognitive-behavioral therapy (CBT) gained recognition as a valuable tool in managing chronic lower back pain. CBT aims to address maladaptive thoughts, behaviors, and emotions associated with pain, empowering individuals to develop coping strategies, relaxation techniques, and problem-solving skills (Morley et al., 2019). By
targeting the psychological aspects of pain, CBT contributes to improved pain management and psychological well-being.

Recognizing the multidimensional nature of CLBP, multidisciplinary programs emerged as an integrative approach to its management. These programs involve collaboration among healthcare professionals from various disciplines, including physical therapists, psychologists, and pain specialists. By combining biomedical, physical, and psychological components, multidisciplinary interventions provide comprehensive care and personalized treatment plans tailored to individual needs (Chou et al., 2017). Such programs have demonstrated positive outcomes in reducing pain intensity, improving function, and enhancing quality of life.

In recent years, self-management interventions have gained prominence in the management of CLBP. These programs empower individuals to take an active role in managing their pain through education, self-care strategies, and behavior change (Lorig et al., 2006). Self-management interventions, including self-help books, online resources, and group-based programs, have shown positive outcomes in reducing pain-related disability and improving self-efficacy.

Furthermore, the integration of complementary and alternative medicine (CAM) therapies expanded the range of options available for CLBP management. Therapies such as acupuncture, massage, chiropractic care, and mindfulness-based approaches have shown potential benefits in pain reduction and improving quality of life (Chou et al., 2017).

Overall, the evolution of CLBP interventions reflects a paradigm shift towards a more comprehensive and patient-centered approach. Recognizing the multidimensional nature of CLBP, interventions now encompass physical, psychological, and social aspects, aiming to
improve overall well-being and functional outcomes. By addressing various factors contributing to CLBP, these interventions offer a more holistic and personalized approach to pain management.

**CLBP Interventions available in India**

Chronic lower back pain is a widespread problem that has a significant impact on individuals' physical, psychological, and social well-being. It is characterized by pain that lasts for more than 3 to 6 months. Chronic pain, including chronic lower back pain, affects a substantial proportion of the global population and is a leading cause of years lived with disability.

In India, multiple interventions exist to address chronic lower back pain (CLBP) among women. These interventions, which span across traditional, medical, and complementary modalities, demonstrate the multi-pronged approach necessary to handle this pervasive condition.

Addressing chronic lower back pain (CLBP) among women in India requires a comprehensive and multifaceted approach due to the complexity of the condition. Interventions ranging from medical, traditional, and complementary modalities to psychosocial and technological methods are currently in use.

The most common medical approach for CLBP in India is the use of Nonsteroidal Anti-Inflammatory Drugs (NSAIDs). They are widely used due to their ability to provide immediate relief from pain (Kanukula et al., 2014). However, the relief is temporary, and SAIDs are not effective for long-term pain reduction, necessitating other interventions (Kanukula et al., 2014). Physical therapy is another vital component of medical approach. It incorporates various exercise
modalities, such as rehabilitation using International Classification of Function-based tools (Ganesh et al., 2016), resistance exercises (Kristensen & Franklyn-Miller, 2012), and yoga (Anheyer et al., 2022), all of which have demonstrated positive outcomes (Grooten et al., 2022). However, these approaches may need to be adapted to better cater to the unique needs of Indian women and their lifestyles.

India's rich tradition of Ayurveda and Yoga offers additional interventions for managing CLBP. Ayurveda includes the use of herbal medicines, diet regulation, and detoxification procedures, while yoga involves physical postures, breathing exercises, and meditation, which have shown effectiveness in improving pain, disability, and quality of life among women with CLBP (Telles et al., 2016). Complementary and alternative medicine (CAM) modalities, such as acupuncture, massage, and homeopathy, are also employed (Naik et al., 2018). These interventions, despite having varying levels of scientific evidence backing their effectiveness, enjoy widespread use due to cultural acceptance and perceived lower side effects.

Mindfulness meditation is gaining recognition as a psychosocial intervention in CLBP management. Research indicates that mindfulness meditation can help shift focus away from pain, promote relaxation, and significantly reduce pain-related fear and anxiety (Kikuchi, 2017; Elma et al., 2022; Woodley et al., 2020). Moreover, emerging technologies such as telemedicine and digital health solutions offer innovative platforms for managing CLBP increased use during the COVID-19 pandemic. They provide accessible and affordable care, including virtual physiotherapy sessions, online pain education programs, and digital behavior change interventions (Kumar & Sachdeva, 2020).

At the policy level, the National Health Portal of India provides general guidelines for managing back pain, including NSAIDs, hot and cold treatments, relaxation techniques, and
supervised exercise sessions (Government of India, 2020). However, significant challenges in terms of accessibility and individualizing these interventions for women, especially in rural regions, remain.

Collectively, these interventions underline the necessity of a multidisciplinary approach to pain management. Effective CLBP management involves various healthcare professionals and a combination of treatments that address different aspects of pain, as echoed by multiple studies (Hwang, 2017).

Addressing chronic lower back pain in India requires comprehensive interventions that consider the socio-ecological model. This model examines the problem at multiple levels of influence, including the individual, interpersonal, community, and policy levels. Interventions should focus on preventive strategies, early identification of risk factors, and targeted treatments. Exercise interventions, rehabilitation programs, mindfulness meditation, and multidisciplinary approaches to pain management have shown positive outcomes in managing chronic lower back pain. A comprehensive and multifaceted approach that addresses risk factors at different levels of the socio-ecological model is necessary to effectively manage chronic lower back pain among women in India.

*Gap Analysis*

Upon an analysis of the existing literature and healthcare landscape for chronic lower back pain (CLBP) among Indian women, several gaps emerge, delineating areas for potential improvement and further research.

- Significant research gap: While the high prevalence of CLBP among Indian women is established, specific research pertaining to this group remains limited
(Bang et al., 2021). Studies often fail to disaggregate data by sex, resulting in an absence of gender-specific insights (Shetty et al., 2022). Furthermore, there is a scarcity of robust longitudinal and qualitative studies that might elucidate the temporal trends and lived experiences of women with CLBP in India.

- Healthcare services gap: Accessibility to quality healthcare services, particularly for chronic pain management, is unequally distributed, with urban areas being favored over rural areas (Venkatesan et al., 2022). Especially in rural regions, women lack access to necessary diagnostic services and effective interventions for CLBP.

- Awareness and education gap: There is an inadequate level of awareness about CLBP, its risk factors, and prevention strategies among Indian women. This lack of knowledge often leads to underestimation of the importance of early detection and timely management of CLBP, consequently resulting in delayed or inadequate treatment.

- Policy gap: Current health policies often do not prioritize non-communicable diseases like CLBP, with no specific policies or guidelines addressing this condition, particularly for vulnerable groups such as women (World Health Organization, 2019).

- socio-cultural gap: Societal and cultural norms often prevent women from seeking and receiving healthcare in India (Mishra et al., 2009). The stigma associated with chronic pain conditions and traditional gender roles often preclude women from prioritizing their health needs.
• intervention gap: Existing interventions for CLBP often do not consider the specific needs and context of Indian women (Rao et al., 2017). Aspects such as lifestyle, occupational hazards, cultural practices, and particular psychosocial stressors are not adequately addressed in intervention design and implementation.

• technological gap: Despite the increasing application of digital health solutions for chronic pain management globally, their utilization in managing CLBP among Indian women is still limited (Cottrell et al., 2020). This is a considerable issue, especially in the context of the COVID-19 pandemic, which has highlighted the importance of remote delivery of healthcare services.

In conclusion, addressing these identified gaps requires a comprehensive, multifaceted approach, integrating strengthened research, enhanced healthcare services, improved awareness and education, developed targeted policies, strategies to tackle socio-cultural barriers, tailored interventions, and leveraging digital health solutions.

Recommendations/public health impact

Chronic lower back pain (CLBP) among women in India is influenced by various risk factors at different levels of the socio-ecological model.

To effectively address the high prevalence of CLBP among women in India, interventions should target the significant risk factors identified. Evidence-based interventions should include promoting physical activity, weight management, gender equality, social support networks, workplace safety measures, and equitable healthcare policies. A comprehensive approach that addresses risk factors at multiple levels of the socio-ecological model is crucial for reducing the burden of CLBP and improving the overall health and well-being of women in India.
Interventions addressing lower back pain (CLBP) among women in India should adopt a multidisciplinary approach that encompasses a range of evidence-based strategies to effectively address the complex nature of the condition. One recommended intervention is the implementation of a comprehensive multidisciplinary program that combines various components, such as exercises, mindfulness-based practices, and psychosocial support, in a series of community workshops. These workshops can be facilitated by a team of healthcare professionals including physical therapists, psychologists, and pain specialists. The program can include tailored exercise regimens that focus on improving core strength, flexibility, and posture, which have been shown to be effective in managing CLBP (Oliveira et al., 2012). Besides, the women who are in risk zone can be invited to workshops for preventative measures of CLBP.

The workshops should include classes educating and empowering women about the problem overall and specific solutions, as well as information of facilities, organizations and closest medical hospitals that can help addressing CLBP along with associated challenges. Workshop series must include at least one class where women come with the family. Choice can be partner, parents, friends or any other close personal surrounding woman feel comfortable with or feel need to educate about CLBP and support associated with it. This addition can help educate not only women, but family and close community about the challenges and problems women suffering from CLBP face. This will also help to break a chain of cultural norms affecting the development or exaggeration of CLBP. Moreover, the intervention such as workshop will possibly increase social support among women and help develop new connections based on the mutual problem, therefore empowering women and increasing confidence.

Next, proposing and teaching a variety of exercises during the workshops, such as aerobic activities, strengthening exercises, and mind-body practices like yoga and Pilates, can
provide women with a range of options that suit their individual preferences and capabilities. Those exercises should be developed in a way when women do not need to spend too much time for workout and can easily incorporate it in the everyday life, choosing what of the options of the exercises work best for each person. Additionally, this type of exercises are know to be a part of Indian culture and will go along with cultural norms (Naik et al., 2018).

Finally, the workshops can have an option of joining online, which will help to increase the accessibility to intervention. Furthermore, for distanced areas workshops should be recorded. Next, with a collaboration of local community workers, recordings can be shown on the more rural areas among the communities of women who has no access to new technologies, devises or the internet.

In addition to physical interventions, incorporating mindfulness-based interventions can be beneficial in managing CLBP among women. Mindfulness-based stress reduction (MBSR) programs, which combine mindfulness meditation, body awareness, and yoga, have demonstrated effectiveness in reducing pain intensity, improving functional status, and enhancing psychological well-being in individuals with CLBP (Cherkin et al., 2016). These interventions can help women develop self-awareness, relaxation skills, and coping mechanisms to manage pain, reduce stress, and improve overall well-being.

Collaboration with non-governmental organizations (NGOs) that focus on women's support and empowerment is crucial in addressing CLBP among women in India. For example, partnering with organizations such as the Self-Employed Women’s Association (SEWA) and the Women’s India Trust (WIT) can provide access to resources, advocacy, and support specifically tailored to women with CLBP. These NGOs have extensive experience in addressing women's health issues and can contribute to the development and implementation of community-based
workshops, peer support groups, and educational initiatives that focus on CLBP management (SEWA, n.d.; WIT, n.d.). These collaboration should also raise awareness of women rights and bring up women voices regarding violence and inequalities not only in the family or community but importantly in work environment as well.

Advocating for policy changes is another important aspect of addressing CLBP among women. This can involve advocating for the inclusion of ergonomic practices in workplaces to prevent and manage CLBP. Raising awareness among employers about the importance of providing ergonomic workstations, promoting regular breaks, and implementing measures to reduce prolonged sitting or standing can help alleviate the physical stress on the lower back. Furthermore, employees should include a break for exercise where all the workers collectively can do exercises or stretching before coming back to work. This intervention can include a collaboration with community worker as well who will lead the exercises or teach work team leader to provide guidance during the exercises time. Additionally, advocating for flexible work arrangements, such as the option to alternate between sitting and standing, can contribute to the prevention and management of CLBP among working women. Collaborating with policymakers, labor unions, and occupational health organizations can help drive policy changes that prioritize the well-being and rights of women in the workforce. Also, advocating for CLBP should bring up the issue of formalizing a protocol of treating chronic pain among women, and CLBP specifically, as chronic pain should be managed in a tailored way for women specifically.

Furthermore, advocating for an increased number of female policy makers in the Indian government can have a significant impact on addressing women’s health issues, including CLBP. Having women in decision-making positions can bring a gender-sensitive perspective to policy development and implementation, leading to better recognition and support for women’s health
concerns. For example, women perspective on health policies can change gender inequities in insurance pricing. Also, using an Affordable Care Act example which significantly increased population health coverage (Patient Protection and Affordable Care Act, 2009), Indian policies of excluding preexisting conditions need a change. Collaborating with other countries and international organizations can facilitate knowledge exchange and the adoption of best practices in CLBP management, leading to improved interventions and policies.

The comprehensive, multidisciplinary intervention program proposed to address chronic lower back pain (CLBP) among women in India promises broad and potentially transformative public health impacts. At the individual level, such an intervention can lead to a significant improvement in the physical and mental well-being of the affected women. By teaching effective exercise routines, mindfulness practices, and providing psychosocial support, women would gain tools and skills to manage their pain effectively and improve their quality of life. The improved physical health can also reduce the risk of obesity and subsequent related health issues such as cardiovascular diseases and diabetes, given that regular exercise is a key preventive measure for these conditions (Fletcher et al., 2018).

Beyond individual health benefits, the intervention can create positive ripple effects at the interpersonal level. Involving family members and close friends in workshops can enhance understanding, empathy, and support within families and social circles. This approach can also help shift societal norms and attitudes regarding CLBP, fostering a more supportive environment for women with this condition. Additionally, by creating a space for women to connect over shared experiences, the workshops can contribute to building supportive networks and community solidarity, thereby further enhancing psychological well-being (Sturgeon, 2014).
At the community level, interventions aimed at reducing CLBP can lead to significant economic and productivity gains. Chronic pain conditions, including CLBP, often result in reduced work productivity and increased absenteeism (Dagenais et al., 2008). By helping women manage their CLBP more effectively, the intervention could potentially increase workforce participation and productivity, thereby contributing to the broader economic development of the community and the country. Furthermore, advocating for ergonomic practices and flexible work arrangements can improve the working environment, making it more appealing for potential employees and reducing the physical stress experienced by workers.

The promotion of gender equality is another critical impact of the proposed intervention. By advocating for more female representation in policymaking, the intervention contributes to fostering a more inclusive, gender-sensitive approach to public health policy. Women in decision-making roles can bring unique insights and advocate for policies that directly address women's health issues, including CLBP. For instance, the issue of gender inequity in insurance pricing can be addressed more effectively with women's input. This will also set the stage for future research, policy changes, and program developments that can continue to address CLBP and other women's health issues effectively (World Health Organization, 2019).

However, while the potential benefits of the intervention are substantial, there are also important challenges and limitations to consider. Firstly, the accessibility and implementation of the program may be affected by various factors such as regional disparities in healthcare infrastructure, literacy rates, and socio-cultural attitudes towards women's health. It's also worth noting that while online workshops increase accessibility for some, digital divides in certain areas could limit the reach of these interventions (Fitzpatrick et al., 2020). Similarly, addressing structural issues like workplace ergonomics and policy changes may involve overcoming
resistance from employers or dealing with slow-moving bureaucratic processes. Additionally, interventions require careful planning in terms of cultural topics while aim to address some changes in this area not to harm authenticity and avoid westernizing of Indian women. Finally, intervention implementation needs to include multilevel evaluation which involving program evaluation specialist.

Despite these challenges, the proposed intervention can make a significant contribution to alleviating the public health issue of CLBP more generally. The multidisciplinary and holistic approach not only addresses the physical aspects of CLBP but also considers psychological, social, and structural factors that contribute to the condition. In this way, the intervention can help to reduce the prevalence of CLBP, improve the health and well-being of affected women, and create more supportive and inclusive environments for them.

Ultimately, the impacts of this intervention could pave the way for further research, policy, and programmatic developments. Future research can build upon this intervention by assessing its effectiveness, exploring ways to enhance its reach and impact, and adapting it to address other health conditions. On the policy front, the success of this intervention can encourage the development of more gender-responsive health policies and workplace practices. Programmatic next steps may involve expanding the scope of the intervention, such as incorporating additional components like nutritional education, and replicating the program in other regions or countries.

Overall, the multidisciplinary intervention recommended for addressing CLBP among women in India holds significant potential for improving individual and community health, promoting gender equality, and inspiring further research, policy changes, and programmatic developments. Despite potential challenges in implementation and access, the broad-reaching
impacts of the intervention make it a promising approach for managing CLBP and improving women's health in India.

**Conclusion**

This paper has addressed the significant public health issue of chronic lower back pain (CLBP) among women in India. The analysis through SEM identified several gaps and challenges related to the prevalence, healthcare services, awareness, policy, socio-cultural barriers, interventions, and technology surrounding CLBP. These gaps highlighted the need for a comprehensive, multi-level approach to address the complex nature of CLBP among women in India.

To address the identified gaps and implement these recommendations, collaboration among various stakeholders is essential. Healthcare providers, policymakers, NGOs, researchers, and community leaders must work together to overcome barriers and ensure the successful implementation of interventions. Monitoring and evaluation of the interventions' effectiveness are crucial to continuously improve and adapt the programs. Scaling up successful interventions to reach a larger population, addressing regional disparities, and promoting inclusivity and accessibility should be key considerations in the next steps.

The recommendations put forth in this paper propose a multidisciplinary intervention program that considers individual, interpersonal, community, and policy factors. The interventions aim to improve the well-being of women, reduce the risks of obesity and related diseases, strengthen family connections, enhance work productivity, and promote gender equality. The potential impacts of these recommendations are far-reaching at each level of SEM – individual, interpersonal, community and public policy level.
In conclusion, this paper highlights the urgency of addressing CLBP among women in India. Continued research, policy changes, and programmatic developments are essential to ensure the sustainability and effectiveness of these interventions and to further advance the understanding and management of CLBP among women in India.
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https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight

Appendix 1

Socio Ecological Model

Factors that directly influence health and well-being at the personal level. Age, parity, obesity, physical inactivity, stress, and depression.

Influence of social relationships and interactions on health. Lack of social support, family dynamics, and gender roles are key factors at this level.

Influence of the social and physical environment on health. Workplace conditions, occupational hazards, and healthcare access are critical factors at this level.

Broader societal factors that shape health outcomes. Socioeconomic disparities, gender inequality, and cultural norms are key factors at this level.
Appendix 2

Rural population (% of total population)


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Appendix 3

Frequency of food ordering or eating out among millennials in India as of 2019

- Less than once in 3 months: 21.2%
- Once in 2–3 months: 17.5%
- Once a month: 28.3%
- 2–3 times a week: 18.5%
- Once a week: 11.1%
- More than once a week: 3.4%
Appendix 4

Proportion of women subjected to physical and/or sexual violence in the last 12 months (% of ever-partnered women ages 15-49) - India

United Nations Statistics Division (UNSD)
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Map

2016
Appendix 5

People living in poverty in India in 2022, by gender (in millions)

© Statista 2023
Appendix 6

Proportion of seats held by women in national parliaments (%) - India

Inter-Parliamentary Union (IPU) (ipu.org). For the year of 1998, the data is as of August 10, 1998.
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**MPH Competencies Checklist**

**Integrative Learning Experience – ILEX**

**Aelita Matosova**

### CEPH Foundational Competencies

<table>
<thead>
<tr>
<th>Competency</th>
<th>Choose at least 2 foundational competencies and briefly note why you feel it is relevant to your ILEX paper or presentation. (Note: all students can choose Competency #19, and mention your specific audience)</th>
</tr>
</thead>
</table>

#### Evidence-based Approaches to Public Health

1. Apply epidemiological methods to the breadth of settings and situations in public health practice

2. Select quantitative and qualitative data collection methods appropriate for a given public health context

3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software as appropriate

4. Interpret results of data analysis for public health research, policy and practice
   
   Will be used when doing literature review and interview analysis to understand the background of health issue

#### Public Health & Health Care Systems
| 5. | Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings |
| 6. | Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels | Will be used when researching, analyzing and discussing risk factors of CLBP among women in India |

**Planning & Management to Promote Health**

| 7. | Assess population needs, assets and capacities that affect communities' health | Will be used when doing gap analysis and proposing interventions |
| 8. | Apply awareness of cultural values and practices to the design or implementation of public health policies or programs |
| 9. | Design a population-based policy, program, project or intervention |
| 10. | Explain basic principles and tools of budget and resource management |
| 11. | Select methods to evaluate public health programs |

**Policy in Public Health**

| 12. | Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence |
| 13. | Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes |
| 14. | Advocate for political, social and economic policies and programs that will improve health in diverse populations |
| 15. | Evaluate policies for their impact on public health and health equity |

**Leadership**

| 16. | Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making |
| 17. | Apply negotiation and mediation skills to address organizational or community challenges |

**Communication**

| 18. | Select communication strategies for different audiences and sectors |
19. Communicate audience-appropriate public health content, both in writing and through oral presentation

Will be used in final presentation and writing ILEX paper about women health in India

20. Describe the importance of cultural competence in communicating public health content

Interprofessional Practice*

21. Perform effectively on interprofessional teams

Systems Thinking

22. Apply systems thinking tools to a public health issue

Will be used when creating/suggesting intervention for women in India

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**MPH - Community and Public Health Practice Competencies**

<table>
<thead>
<tr>
<th>Competency</th>
<th>If CPHC is your program concentration, choose at least 2 competencies you plan to draw on and mention how it is relevant.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Apply qualitative methods to assess community assets for addressing public health and environmental issues</td>
<td>Will be used when analyzing existing intervention and programs for women in India</td>
</tr>
<tr>
<td>2. Analyze how issues of power, race and ethnicity, sex and gender identify, and socioeconomic factors affect the development, implementation, and evaluation of community-based projects</td>
<td>Since I will work with specific population – women in India I will be using sex, race and socioeconomic factors when analyzing the issue and suggesting changes</td>
</tr>
<tr>
<td>3. Develop a research project proposal using mixed methods to address a public health problem</td>
<td></td>
</tr>
<tr>
<td>4. Apply project management strategies to improve the quality of programs and services in public health settings</td>
<td></td>
</tr>
<tr>
<td>5. Identify environmental health risks in vulnerable communities and examine strategies to reduce exposures</td>
<td></td>
</tr>
</tbody>
</table>

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**MPH – Health Policy Leadership Competencies**
### Competency

<table>
<thead>
<tr>
<th><strong>Competency</strong></th>
<th><strong>If HPL is your program concentration, choose at least 2 competencies you plan to draw on and mention how it is relevant.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Predict how health policies may impact risks and drivers of health outcomes at the health system and public health sector level</td>
<td></td>
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<tr>
<td>2. Synthesize evidence from literature review and/or databases to write a policy paper for a specific audience, identifying a problem and proposing alternative approaches to meet health needs in underserved communities</td>
<td></td>
</tr>
<tr>
<td>3. Design a leadership plan and strategies to manage stakeholders and related political processes, addressing conflict, resistance, and cooperation in the implementation process</td>
<td></td>
</tr>
<tr>
<td>4. Communicate recommendations to improve organizational strategies and capacity to implement health policy</td>
<td></td>
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<tr>
<td>5. Advocate and make recommendations on legislation or regulation related to a current environmental health issue, drawing on risk assessment evidence</td>
<td></td>
</tr>
</tbody>
</table>

### MPH – Behavioral Health Competencies

<table>
<thead>
<tr>
<th><strong>Competency</strong></th>
<th><strong>If BH is your program concentration, choose at least 2 competencies you plan to draw on and mention how it is relevant.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Plan a health education training, curriculum, or workshop including stakeholder identification, resource planning and timeline, volunteer recruitment and marketing, strategy selection, and monitoring process.</td>
<td></td>
</tr>
<tr>
<td>2. Effectively deliver evidence-based health education and behavior change intervention skills such as motivational interviewing, health coaching, peer education, mindfulness, or social media messages to individuals or groups.</td>
<td></td>
</tr>
<tr>
<td>3. Analyze the impact of chronic conditions and propose strategies to address prevention and management across all levels of the Socioecological Model.</td>
<td>I will work on chronic pain among women in India and use this competency to analyze the impact of this condition on my population and propose a solution</td>
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<tr>
<td>5. Develop a data collection and analysis plan including measures and methods for research on behavioral health.</td>
<td></td>
</tr>
</tbody>
</table>