Overview of the Importance of Occupational Medicine, Road Safety, and Injury Prevention

Road Safety

Through the years, injuries remain a significant yet preventable threat to public health worldwide, contributing to illness and death across communities, workplaces, and road systems. The World Health Organization (WHO) emphasizes that more than 1.19 million people die each year due to road traffic injuries, and more than 50 million people across the world experience non-fatal injuries annually, negatively affecting not only the healthcare system but also the countries' economy.[1] Mulugeta et al. reported that around 90% of deaths caused by injuries are typically observed in low- and middle-income countries.[2] In ASEAN countries, comprising Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam, and Timor-Leste, around 35.5 million cases of injury were recorded in 2021, accounting for around 317,000 deaths.[3] Road injuries are considered the primary contributor to mortality and morbidity in the said countries, particularly in Thailand and Malaysia, where the highest age-standardized Disability-Adjusted Life Year (DALY) rates were observed.[3] This burden is also influenced by demographic and socioeconomic factors across different countries. Around two-thirds of road traffic injuries involve working-age individuals aged 18 to 59 years, with men having a three times higher likelihood of death in such incidents compared to females.[1] Moreover, individuals in low- to middle-income countries are more likely to be affected by road traffic deaths, accounting for more than 90% of such fatalities.[1] Specifically, individuals of working age with lower socioeconomic status, even in more progressive countries, have a higher likelihood of being involved in road traffic accidents.[1] In particular, Gu et al. mentioned that the common cause of fatal road injuries is work-related (coming from and to work; and along the route of work destinations), 72.2% among males and 41.4% among females (41.4%).[4] These findings highlight the important role of both occupational and environmental factors in the occurrence of injuries, emphasizing the relevance of occupational health in addressing injury-related issues and public safety, particularly in workplace settings.

Occupational Medicine, Safety and Health

According to the World Health Organization, occupational health primarily focuses on promoting health in the workplace, particularly the physical, mental, and social well-being of workers across different occupations.[5] It also aims to improve workplace conditions and environments to make them more favorable to safety and health.[5] Specifically, focusing on this aspect reduces the likelihood of workplace accidents or injuries through hazard identification and mitigation, while also improving the productivity of employees, as they are able to work better in a safe and secure work environment.[6] While occupational health is a broad and multidisciplinary field in public health focused on the preventive and promotive aspects of ensuring safe work environments, occupational medicine, on the other hand, is a more specific medical specialty that is concerned with the clinical domains, including the diagnosis and treatment of work-related injuries and illnesses, and by any standards, it should be practiced by trained physicians or medical specialists. The World Health Organization classifies occupational medicine under the umbrella of occupational health along with several other disciplines like nursing, ergonomics, psychology, hygiene, safety, and many others.[5] It is focused on the assessment of the health of workers, connecting workplace conditions and processes to health, supporting the management of health, skills, and the working capacity of the entire workforce, and addressing individual cases with regard to the working ability and productivity. Occupational medicine, which is under the domain of occupational health, encompasses the primary, secondary, and tertiary prevention of health issues in the workforce, which may also impact the health of the whole population.[7]

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However, the concept of occupational medicine has been defined in various ways in the literature, reflecting the differences in perspectives and scope among authors and institutions. da Cunha et al. define occupational medicine as an interdisciplinary field that integrates the knowledge from public health, organizational psychology, and human resource management to create initiatives to mitigate the adverse effects of work activities while promoting healthier and more productive workplaces.[8] For Chen, the terms occupational medicine and occupational health are interchangeable, pertaining to a branch of medicine that centers on the health and welfare of individuals with regard to their work environment, encompassing various medical specialties such as preventive medicine, epidemiology, toxicology, and rehabilitation medicine, among others.[9] Walker-Bone and Hollick emphasize that occupational medicine is not simply workplace healthcare, but it is a discipline that supports a fundamental determinant of health, as work can support social mobility, encourage inclusivity, and should be viewed as a fundamental human right.[10] According to studies, the significance of work in relation to health is most evident among individuals with no jobs, as it was found that they experience a higher prevalence of mental health issues, worse poverty, a higher likelihood of self-harm, and a 20-30% increased risk of suicide. These findings strongly demonstrate how work and health are "inextricably linked" and the reason why occupational medicine exists.[10] Ultimately, despite the various definitions of occupational medicine, the core objective remains to be aimed at the protection and promotion of the workers' health.

Globally, 2.9 million deaths are attributed to work, with 2.58 million deaths due to work-related diseases and 0.32 million related to occupational injuries.[11] Globally, work-related diseases with a long latency period are increasing, while the number of occupational injuries has decreased. Work-related circulatory diseases are the major cause of 912 000 deaths globally, followed by 843 000 work-related malignant neoplasms.[12] In high-income, American, Eastern European, and Western Pacific World Health Organization regions, work-related malignant neoplasms comprise the biggest disease group.[12] DALYs attributable to work are estimated to be 180 million in 2019, with an associated economic loss of 5.8% of global GDP.[12] This is aggravated by the lack of OSH services, specifically in informal sectors. The Philippine workforce structure is composed of the formal and informal sectors, wherein only about one-third of workers are in formal employment with complete social and labor market protections, while the remaining workers, which comprise the larger fraction, are informal and only have limited protections.[13] This means that workers in informal settings are less covered by occupational health systems, more exposed to hazardous work conditions, and, for aging workers who are vulnerable to chronic diseases, become more susceptible.

In the Philippines, the Constitution provides that the state shall afford full protection to labor, local and overseas, organized and unorganized, and promote full employment and equality of employment opportunities for all. Moreover, the state shall guarantee the rights of all workers to self-organization, collective bargaining and negotiations, and peaceful concerted activities, including the right to strike in accordance with law.[14] They shall be entitled to security of tenure, humane conditions of work, and a living wage. They shall also participate in policy and decision-making processes affecting their rights and benefits as may be provided by law. The state shall also promote the principle of shared responsibility between workers and employers and the preferential use of voluntary modes in settling disputes, including conciliation, and shall enforce their mutual compliance to foster industrial peace. Finally, the state shall regulate the relations between workers and employers, recognizing the right of labor to its just share in the fruits of production and the right of enterprises to reasonable returns to investments and to expansion and growth.[15]

Injury Prevention

The burden of injury is felt globally, as injuries continue to be among the leading causes of mortality and disability across populations worldwide, affecting all ages, sectors, and socioeconomic backgrounds.[16] Approximately 16,000 people die from injuries each day worldwide, and among the vulnerable populations affected are children.[17] More than 2,600 children below age 18 die every day from injuries globally, and the leading causes are road traffic injuries, drowning, and fire-related burns.[17] In the United States, 33 children die every day from preventable injuries, and 1 in 4 children experiences an injury severe enough to require medical attention, bed rest, and missing school.[17] It was also found that for every child injury death, there are 19 hospitalizations, 233 emergency department visits, and 450 physician visits, emphasizing the significant burden of injury.[17] In recent data, injuries are reported to cause 4.34 million deaths worldwide in 2021 and account for 247.8 million disability-adjusted life-years (DALYs).[3] Over 85% of injury-related deaths occur in low- and middle-income countries where preventive measures are scarce, and where emergency medical services and surgical care systems are often limited.[3] Regional estimates for the ASEAN countries are also available. In 2021, the ASEAN recorded 35.5 million injury incident cases, which resulted in about 317,000 injury-related deaths and 18.4 million DALYs lost due to injuries.[3] These numbers translate into injuries accounting for 5.9% of all deaths and 8.1% of all DALYs across the ASEAN region.[3] The ASEAN countries with the highest injury deaths in 2021 include Indonesia (12.3 million), Vietnam (6.16 million), Philippines (5.5 million), Myanmar (4.31 million), and Thailand (3.67 million), whereas the lowest number of injury cases was in Brunei, with only about 64,000 cases.[3] Historically, injuries were viewed as unavoidable "accidents" or random events, which led to their neglect

within the public health realm when, in fact, injuries are avoidable. Various pieces of evidence demonstrate that most injuries are indeed predictable and preventable through systematic interventions, including injury surveillance, identification of risk factors, development and implementation of preventive measures, and the dissemination of effective and evidence-based strategies, which lay the conceptual foundation for injury prevention and safety promotion and their important role in public health frameworks.[17] This is also the underlying framework of the International Safe Community program that is recognized by the World Health Organization as an important initiative to promot safety in local governments and communities. The Safe Community framework focuses on protecting at-risk groups and dangerous environments by using proven interventions, tracking injury data, and encouraging local ownership. The model's global success highlights the power of localized safety initiatives. Localities can earn an official "Safe Community" designation by fulfilling specific benchmarks. According to the International Safe Community Certifying Centre (ISCCC), this title applies to any municipality, county, or district that actively prevents injuries, violence, suicide, and natural disaster impacts across all demographics while participating in a global network of accredited programs.[18] Data shows that this program typically cuts injury rates by 25% to 30%.[16] For instance, China's Youth Park Safe Community achieved a 34.2% drop in total injuries alongside a major boost in public safety awareness.[16] Similarly, initiatives in South Korea successfully lowered fatal injuries among children and seniors, notably driving down elderly mortality from falls by 63% (dropping from 32.0 to 11.7 deaths post-intervention).[16] In Iran, the Kashmar Safe Community saw injury fatalities plummet compared to areas without the program.[16] Beyond saving lives, the model is highly economical.

The traditional injury prevention areas include child safety, elderly safety, traffic safety, home safety, leisure safety, occupational safety, sport safety, school safety, and violence and crime prevention. In addition to this, the Safe Community programs have identified several emerging areas in injury prevention, which now include first aid, alcohol consumption, tobacco restrictions, disaster preparedness, food hygiene, environmental health, water supply, healthy nutrition, and physical activity.[16]

Integration

A typical health approach would manage road safety, occupational medicine, and injury prevention as separate entities, as these fields vary in nature, although they can be closely related through one theme, which is safety promotion – be it on the road, at the workplace, at home, or any place where injuries are possible. There is growing evidence suggesting that an integrated approach to health – that is, bringing together occupational safety and health, workplace health promotion, and safety culture in a single system – results in increased worker participation in safety and health promotion initiatives, decreased occupational injury and disability rates, and decreased health care and societal costs.[19]

An integrated worker health approach is described as "the coordination of goals and activities between the occupational health and safety and the health promotion functions of organizations."[19] The fundamental concept of an integrated approach involves coordinating OSH and health promotion activities that would allow both to coexist and to mutually inform and influence each other, instead of treating them as separate matters.[19] The primary focus of an integrated worker health approach is placed on organizations, both public and private, including as well those outside of the government, highlighting the need to take accountability for road safety as an aspect of occupational and public health duties. Moreover, both the public and private sectors should prioritize road safety within the systematic management of the work environment as mandated by OSH laws.[20] Applying the integrated worker health approach changes the landscape for road safety, which should now be a shared responsibility of both occupational health and public health. The link of road safety to occupational and public health is now increasingly recognized, as data on work-related road crashes emerge. Studies found that nearly 40% of fatal road crashes involved drivers at work, and approximately 10% involved commuters, and this was the same for a recent study.[20] This shows that work-related fatal road crashes are a significant concern and therefore this highlights the importance of integrating road safety into occupational health and public health as a whole.

Biswas et al. identified several extraorganizational, organizational, worker-level, and program-level barriers and facilitators to implementing an integrated worker health approach.[19] One notable organizational barrier is the lack of management/leadership support. Moreover, the study revealed that limited resources (finances, time, downsizing, high staff turnover); poor organizational culture (resistance to change, top-down decision-making, poor fit with company culture and mission, weak existing OSH infrastructure); worker-level barriers (low participation, privacy concerns, distrust in management's intentions in protecting health and safety, work demands, unpredictable work schedules, lack of workplace champions), and many others are big challenges to integration. On the other hand, the facilitators of successful integration include support from leadership and management; a strong health and well-being culture; advocacy by senior leadership, middle managers, and worksite health promotion practitioners; existing policies, programs, and practices focused on flexible and supportive working conditions; existing health promotion practices; union support; workplace champions; adequate resources; and collaboration with external stakeholders, among others.[19]

Furthermore, Biswas et al. provided ten recommendations for implementing integrated worker health approaches as follows: (1) Legislation, policies, and incentives protect and promote worker health; (2) Gain leadership support; (3) Demonstrate leadership commitment; (4) Needs assessment and worker-centered approach to program implementation; (5) Establish a healthy workplace committee; (6) Identify and utilize workforce "champions"; (7) Create awareness and provide training; (8) Build capacity for workers to make healthy decisions and being flexible to participate in integrated efforts; (9) Develop privacy measures; and (10) Evaluate the program.[19]

Occupational health can be viewed as a domain, discipline, and framework for prevention of injuries and diseases, promotion of physical health and mental health, improvement of well-being, and building of resilience against disasters and emergencies. Occupational health can provide a framework through which all of these - road safety initiatives, occupational medicine, injury prevention strategies, and workplace health promotion can be coordinated into a comprehensive worker health system.

Jinky Leilanie Lu, MOH, PhD

Road Safety Program, and Injury Prevention and Control Study Group, National Institutes of Health, University of the Philippines Manila, Manila, Philippines

Raymond Francis R. Sarmiento, MD

Metro Pacific Health Tech Corporation Pasig City, Philippines

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