The state of youth health in Ghana's construction industry

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Samuel Yaw Frimpong • Abena Bemah Antwi • Ethel Seiwaa Boateng
Jonathan Antwi Hagan • Peter Annor Mensah

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About the authors

Samuel Yaw Frimpong is a construction management consultant and researcher with over 10 years' experience in the construction industry. He is the current chair of NOVUS, the youth group of the Chartered Institute of Building (CIOB) in Ghana. Samuel's research interests cut across construction health and safety management (physical and mental), construction stakeholder management, and teaching and learning in the built environment.

Abena Bemah Antwi is a Valuation and Estate Management Surveying Consultant. Her research interests include construction mental health and safety management, property valuation and asset management, and professional practice in the built environment.

Ethel Seiwaa Boateng is Youth Forward's Learning Partnership Coordinator in Ghana at Participatory Development Associates Ltd. She is a development practitioner with experience in youth employment and skills development, community mobilization and stakeholder engagement, project design and implementation, monitoring and evaluation and learning and socio-economic research. She is passionate about mitigating poverty and inequality and promoting sustained social and economic development. Her research interest is in youth aspirations, employment and positive development and policy issues that concerns children and youth.

Jonathan Antwi Hagan is an international development expert and a former Senior Project Officer at the Community Driven Development (CDD) Unit at Participatory Development Associates Ltd. He has over four years' experience in community development and advocacy and has been involved in a number of poverty and wellbeing research initiatives in Ghana such as the Youth Forward Learning Partnership (Overseas Development Institute and partners) and the Community Voice Articulation project (World Vision International and Rural Research and Advocacy Group). Jonathan's research interests span poverty, rural development, sustainable human wellbeing, and agrarian change.

Peter Annor Mensah is an Assistant Project Officer with Participatory Development Associate. He works directly with Advocacy and Communications Unit and assists in coordinating activities of the Youth Forward Learning Partnership. His research interests span areas of child rights and child protection, as well as youth development.

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Executive Summary

Research shows that the rapid and dynamic pace of work, the high-risk nature of tasks, the use of harmful materials and dangerous equipment, and other issues such as personality conflicts and heavy workload expose the construction workforce to significant physical and psychosocial risks which significantly affect their health. Notable among this group are the young people aged 18 to 35 years who work in the construction industry. If left unchecked, the health impacts of construction work can have devastating consequences on the quality of life of many young people and the economy at large. In recent years, the issue of youth health and safety in the construction industry has begun receiving attention by researchers, the media, policymakers, and other stakeholders. However, much of this has happened in the Global North[1]. Very little is known and understood about the health and safety of young people in the construction industries of the Global South[2]. Using Ghana as a specific case, this research seeks to explore three key questions:

- What physical and mental health conditions exist among young construction workers?
- Who are the stakeholders of young construction workers' health and what roles do they play?
- Which stakeholders are preferred by young construction workers to help address their health conditions?

This report explored the current state of youth health in Ghana's construction industry. The study found that the multi-component strain that young people are subjected to at work, causes physical (i.e., musculoskeletal disorders and skin-related problems) and mental health problems (i.e., mood disorders, somatic symptoms, substance use disorders, poor sleep, and schizophrenia) for a significant number of young people in Ghana. The study also found that, the poor health of young construction workers significantly contributed to reduced work ability and days away from work. These outcomes have the potential to end in low quality life and ultimately suicide.

Nine categories of stakeholders of young construction workers' health were identified, viz.: health group, occupational health and safety agencies, construction industry actors, government, academia, media, youth health activists and promoters, community, and construction employees. Among these, young construction workers' most preferred stakeholders for addressing their health issues were the media, academia, and youth health activists and promoters. The least preferred stakeholders were government, and occupational health and safety agencies.

To successfully tackle the problem of poor youth health in the construction industry, all stakeholder roles should be clearly defined. Furthermore, a collaborative and coordinated effort should be directed to undertake more research, develop policy frameworks, design and implement workplace wellbeing interventions, and increase health and safety literacy.

1 The "Global North", or "developed countries", refers to regions mainly in Europe, North America, and Australia with developed economies.

2 The term "Global South" is used interchangeably with "developing countries", "lower-and-middle income countries (LMIC)", and the "third world", and refers broadly to countries with non-Western cultural backgrounds that have suffered from colonization and its attendant consequences such as under-development, neo-imperialism, political and cultural marginalization, and inadequate access to resources (Dados and Connell 2012; Fernando and Moodley 2018).

1.0 Introduction

Construction work ranks among the three most dangerous occupations in the world (Safe Work Australia 2012). The rapid and dynamic pace of work, high-risk nature of tasks, use of harmful materials and dangerous equipment, and other issues such as personality conflicts and heavy workload expose the construction workforce to significant physical and psychosocial risks (Gunasekaran et al. 2016). Included in this group are young people who are employed in various sectors of the construction industry (International Labour Organization [ILO] 2018). The case of young construction workers is especially crucial because they are still undergoing physical, emotional, mental, social, and professional development (ILO 2018). Additionally, they have less "decision authority" over their job conditions (Zaniboni et al. 2016). Thus, when exposed to the hazardous nature of construction work, young workers are more likely than older ones to experience a high rate of negative physical and mental health outcomes such as permanent physical injury and disability, substance abuse, depression, and suicide among other things (Dong et al. 2015; Kines et al. 2013; Spencer-Thomas 2016). This has made it imperative to seek a deeper understanding of health and safety issues among young construction workers. Correspondingly, a growing scholarly literature about the subject is emerging on both the general physical health and mental health of construction workers.

In the case of physical health, studies have been conducted on issues such as the relationship between working hours, work-life balance, and mental health (Kotera et al. 2019); the relationship between occupational accidents and workplace psychological factors (van der Klauw et al. 2015); the role of stakeholders in safety improvement (Donkoh and Aboagye Nimo 2017); and the effectiveness of health and safety regulations (Eyiah et al. 2019). In the area of mental health, issues that have been explored include mental health conditions such as stress, anxiety, depression, and suicide (Heller et al. 2007; Scott-Young et al. 2018); mental health interventions for young construction workers (Broadbent and Papadopoulos 2014); the relationship between physical injury and mental health (Dong et al. 2015); and effects of the workplace psychosocial environment (Pidd et al. 2017).

The current body of literature on youth health and safety in the construction sector is limited to the young people in developed countries such as Australia and the US. Only few studies have been conducted in the Global South[3], with much of what is available being skewed toward physical health and safety issues. This shortfall indicates a paucity of reference material specific to the situation of young construction workers in the Global South, a situation that can potentially make it difficult to develop appropriate preventive physical and psychological health and safety interventions that are responsive to the situation of young construction workers in this part of the world (Fernando and Moodley 2018).

Almost 90% of young people under the age of 24 years reside in the Global South (Index Mundi 2019). Additionally, the Global South accounts for about 70% of burden of mental ill-health (Alloh et al. 2018). It is therefore important to give priority to any issues that affect the health of young people in this part of the world if improvements are to be made in the management of construction health and safety both locally and globally. By giving attention to the health of a significant group of people (i.e., young construction workers in the Global South) this study has the potential to provide insights that can help accelerate construction safety performance towards achieving the

3 See e.g., Adhikary et al. 2018; Fung et al. 2016.

"zero harm" goal (Sunindijo and Zou 2013) and Sustainable Development Goal (SDG) number 3 (good health and well-being).

As is the case in many Global South countries, Ghana's construction industry is attracting an increasing number of young people (ILO 2017). Both young male and female workers below and above the legal working age are entering the construction industry at a faster rate than older workers (International Programme on the Elimination of Child Labour [IPEC] 2011). This is facilitated by industry conditions such as a high number of small construction firms; the project-based nature of construction work; extended procurement chains; multiemployer worksites; high worker turnover and the extensive use of casual and inexperienced workers (Boadu et al. 2020; Dansoh et al 2017). Within the last decade, the construction industry in Ghana has received both foreign and local investment to tackle youth challenges such as unemployment, inadequate technical training, and poor health and safety (Darko and Löwe 2016).

This study therefore explores the subject in-depth from the context of Ghana's construction industry.

The aim of this study was to explore the health condition of young construction workers and to identify the key stakeholders responsible for managing youth health and safety in Ghana's construction industry. Consistent with the definition of "youth" (Organization for Economic Co-operation and Development [OECD] 2018), this study focuses on young construction workers from 18 to 35 years of age. Attention is given to both on- and off-site construction professionals, artisans, apprentices, and academic trainees.

Using a mixed-methods approach, this study sought to answer the following research questions:

- *RQ 1: What physical and mental health conditions exist among young construction workers?*
- *RQ 2: Who are the stakeholders of young construction workers' health and what roles do they play?*
- *RQ 3: Which stakeholders are preferred by young construction workers to help address their health conditions?*

This report begins with a presentation on the background and characteristics of Ghana's construction industry (Section 2). In Section 3, the literature on construction health and safety is reviewed. Attention is given to both the broader literature on physical and mental health as well as the literature specific to the case of young construction workers. Next, the methods employed in this study are outlined in Section 4, after which the results of the study are presented in Section 5. Subsequently, the implications of the findings are discussed in Section 6. Next, practical recommendations are outlined for different stakeholders in Section 7. Finally, in Section 8, the conclusions of the research are presented, and recommendations are made for the improvement of research and practice on youth health and safety management in the construction industry.

2.0 The construction industry in Ghana: characteristics and contributions

Rapid population growth and urbanization have resulted in an increased demand for the services of the construction industry in Ghana. The industry is made up of building project consultants, engineers, architects, quantity surveyors, building contractors, and artisans. In the absence of a unified governing authority to oversee the activities of the sector, the Ministry of Works and Housing and the Ministry of Roads and Highways have assumed the responsibilities of overseeing all building and civil works in the country, and the activities of players in the construction and maintenance of roads, highways, railways, airports, and other structures, respectively (Owoo and Lambon-Quayefio 2018). Registration and classification of contractors within the industry are done by these ministries *(ibid.).*

Contractors in the housing subsector are grouped into four classifications based on the value of projects they undertake. While class 1 contractors (D1K1) have the capacity to execute projects that are above US$500,000 in value, class 2 contractors (D2K2) have the capacity to implement projects that are up to a value of $500,000. Class 3 (D3K3) and 4 (D4K4) contractors have the resources to implement projects with a maximum value of $200,000 and $75,000, respectively (Frimpong and Kwasi 2013; Ahmed et al. 2014; Owoo and Lambon-Quayefio 2018).

Even though the construction sector in Ghana continues to be bedeviled with a lot of operational, systemic, and health challenges including difficulty in accessing funds for projects, insufficient engineering capacity and poor workmanship, political influence in awarding contracts, delay in paying contractors, and the absence of a central body to coordinate and regulate the activities of industry players (Ofori-Kuragu et al. 2016); it is considered one of the most viable sectors that employs a greater chunk of the Ghanaian youth. The majority of the workers in the construction sector are youth, and they are mostly found in the informal sectors of the industry (Darko and Löwe 2016).

Notwithstanding the numerous challenges it is faced with, the construction sector has contributed enormously to economic growth and reduction in the rate of youth unemployment in the country. Records show that the construction sector recorded a growth rate of 8% in 2006 which made it the fastest-growing sector of the economy at the time. In 2013, even when Ghana's economy registered its lowest growth rates, the construction sector's growth was higher than the national average (Darko and Löwe 2016). The sector's growth rate was 8.4% while the national economy grew only at 5.4% in 2013 (Institute of Statistical, Social, and Economic Research 2015; Ghana Statistical Service [GSS] 2019).

The construction industry is dominated by physical infrastructure and asset-based-lending as a means for growth and development (Songwe 2014). Over the past two decades, Ghana's construction sector has both contributed to and benefited from a rapidly growing economy and continues to be one of the fastest growing of the 21 sub-sectors of the economy, (GSS 2019). There has been significant investment into rail, road and property projects by successive governments

over the years[4]. Asamoah and Decardi-Nelson (2014) observe that the construction industry contributes about 5% to 10% of Gross Domestic Product (GDP) to the country. In 2016 and 2017, construction contributed 13.7% to GDP (GSS 2019).

As a contributor to youth employment, the construction industry in Ghana offers training and apprenticeship opportunities to many young people (Asamoah and Decardi-Nelson 2014). Given a projected increase in infrastructure deficit in Ghana, it is imperative for stakeholders to develop strategies to help improve the industry's capacity to provide more infrastructure, while contributing to youth unemployment, wellbeing, and national economic growth.

4 The Conversation. Ghana's Construction Industry is lively but needs regulation https://theconversation.com/ghanas-construction-industry-is-lively-but-needs-regulation-124733)

3.0 Occupational health and safety in the construction industry

Occupational health and safety (OHS) focuses on the promotion and maintenance of the physiological and psychological status of workers (Kheni 2008). In the construction industry, OHS management is a cross-disciplinary concept that is concerned with protecting the health, safety, and well-being of the construction workforce (Lingard and Rowlinson 2005). It has been argued that the concept of OHS should be expanded to cover the environmental impact of construction activities (Liu et al. 2014). The concept of OHS therefore broadly covers the effects of construction work on the health and safety of construction workers, the environment (HSE), and the situation of those outside the construction workforce who might be affected by construction activities. In this study however, we limit our attention to the construction workforce only.

Construction health and safety is an issue of global concern, and within the last decade, the industry has gained special research attention (Safe Work Australia 2015). Nonetheless, the attention has been skewed towards issues of general safety and environment, and less on the management of workers' health (Yuan et al. 2018). The literature on workers' health focuses on the two broad aspects of physical and mental health. In the area of physical health, research (e.g., Rowlinson et al. 2014) has mostly examined the critical factors affecting physical health and the management of workplace safety. Other issues studied include the link between physical health and safety, and how OHS performance can be incorporated in construction management practice (Kartam 1997; Sousa et al. 2014). The mental health management literature can be categorized into four main themes, viz.: impacts of workers' relationships; influence of workers' lifestyle, effect of work content and environment characteristics; and construction workers' mental health attitudes (Boschman et al. 2013; Yuan et al. 2018). In the sections that follow, the literature on physical and mental health management of the general construction workforce is each reviewed.

3.1 Physical health

Worldwide, the problems associated with construction hazards and accidents (e.g., claims, illnesses, injuries, deaths, low productivity, etc.) continue to soar despite persistent and focused efforts to improve construction health and safety (Yuan et al. 2018). Recent studies of the construction industry in Ghana and elsewhere (e.g., ILO 2018; Williams et al. 2019; Moyce and Schenker 2018) suggest that the physical health of construction workers is usually poor because they are simultaneously subjected to a host of hazards. This makes construction workers susceptible to long-term disability (Stover et al. 2007).

Construction hazards have been categorized into five main groups, viz.: safety, physical, biological, chemical, and ergonomic. Physical hazards comprise different conditions such as noise and vibration, extreme temperatures, different types of lighting, and radiation (e.g., ultraviolet radiation from the sun and welding) that are capable of causing physical harm (ILO 2018; Williams et al. 2019). Safety hazards arise from the use of dangerous equipment, tools, and machinery; working in trenches, slippery surfaces, and at heights; working near or

operating vehicles; and working with or close to flammable or explosive substances (ILO 2018). These hazards often cause immediate injuries such as strains, suffocation, burns, and internal damage. Worldwide, falls from heights cause almost half of fatal injuries among construction workers (Dong et al. 2017). Ergonomic hazards include lifting and carrying heavy loads; working with poorly designed machines and tools; adopting awkward postures and engaging in fast or repetitive movements. This type of hazard usually results in musculoskeletal disorders (MSDs) such as "back pain, tendinitis, herniated discs, and carpal tunnel syndrome" (ILO 2018). Chemical hazards include gases, dusts, fumes, vapours and liquids and are very common in the construction sector. Construction workers are exposed to chemicals from paints, solvents, adhesives, welding fumes, and cleaning agents (ILO 2018). The toxic effects of these substances depend on the amount, duration of exposure, and individual characteristics (e.g., age and gender) (ibid.). Chemical hazards have been linked with long term respiratory diseases and health conditions such as chronic obstructive pulmonary disease, lung cancer, silicosis, asbestosis, and hearing loss in construction workers (Dong et al. 2015).

3.1.1 Conditions, outcomes, and risk factors affecting young workers

A review of the extant literature indicates that young people suffer the same types of physical health conditions as their older counterparts. Nonetheless, reports by the IPEC (2002) and the ILO (2018) indicate that young construction workers stand a higher risk of adverse health conditions resulting from five main risk factors - low level of safety education; stage of physical development; limited job skills and work experience; and a combination of other "cross-cutting factors" such as gender, discrimination, and lack of supervision. Many young construction workers are either seasonal workers or immigrants with low levels of education, training, and experience and have little understanding of safety issues. This makes them less compliant with safety procedures and more likely to take unreasonable risks (Gyekye and Salminen 2009). Also, due to the stage of their physical development, many young workers have higher respiratory and metabolic rates per unit of body weight than older adults, and this makes their bodies absorb more toxins and undergo extreme reactions in the process. Young people are therefore more likely to suffer impairment of their hormonal systems, reproductive systems, and brain functions (Gerry 2005). Other studies by the IPEC (2011) have reported that young people stand a higher health risk when operating construction machinery and equipment because they are designed for older adults. The noise rating for many machines, for example, although safe for adults, are unsafe for young people and can cause hearing loss (Forastieri 2002).

3.1.2 Stakeholders, roles, and interventions

Previous studies have sought to identify the stakeholders of OHS in the construction industry. The ILO (2018), for instance, has suggested four stakeholder groups viz.: governments, employers, workers, and young workers. In Ghana, stakeholders have been identified to include the government, employers (i.e., clients and contractors), and consultants (Donkoh and Aboagye-Nimo 2017; Fugar and Agyakwah-Baah 2010; Kheni et al. 2006). Among these, contractors have received the most attention in the literature. There is however a lack of in-depth research on other stakeholders, as well as the roles of stakeholders in the management of the physical health of young construction workers.

Government's responsibilities include the development, implementation, and enforcement of a national safety framework to support the development of preventive strategies, the design of appropriate and effective workers' compensation schemes, and the notification, recording, and publishing of OHS incidents and diseases at the firm, sectoral, and national levels (Donkoh and Aboagye-Nimo 2017; ILO 2018). Employers are responsible for ensuring that employees are trained and have access to OHS guidelines (Kheni et al. 2006). Employers are also responsible for recording and reporting OHS incidents to the appropriate authorities. Consultants can augment the

work of employers by developing contract conditions that are detailed enough to respond to specific and important OHS issues (Donkoh and Aboagye-Nimo 2017; Laryea and Mensah 2010). Employees can serve as part of an early warning system by providing OHS information - workplace accidents including potential accidents and near-misses - about themselves and other workers in a timely manner (ILO 2018). Consistently, the literature indicates that stakeholders are not effective in the management of OHS (Donkoh and Aboagye-Nimo 2017; Eyiah et al. 2019). This calls for in-depth studies on stakeholder management practices and performance of construction health and safety.

OHS interventions in the construction industry exist mainly in the form of government legislation (Eyiah et al. 2019). According to Agyekum et al. (2018), exception for the Factories, Offices and Shops Act (1970) which has a few provisions for on-site construction work, there are no direct interventions for construction OHS. The construction industry has therefore had to rely on a several generic legislations to manage OHS (Annan et al. 2015). These include the Labour Act, 2003; the Workmen's Compensation Act, 1987; among others[5]. Besides these, there are international conventions developed by the ILO for addressing OHS issues like labour inspection, weekly rest, paid leave and night work, hours of work, etc.[6]

3.2 Mental health

Mental ill health in the construction industry is increasing worldwide (Milner and Law 2017). In the United Kingdom (UK), almost one-fifth of occupational health problems in construction industry are linked to mental health conditions such as stress, anxiety, and depression (Mates in Mind 2017). Furthermore, over half of the UK construction workforce have experienced some form of mental health problems, with almost half of mentally ill workers still at work. Suicide rate among UK construction workers is reported to be about ten times higher than work-related fatalities. In Australia, it is reported that compared to other workers, suicide is on the increase among construction workers, especially labourers, with incidents being significantly more than suicide among the general male population (Martin et al. 2016; Milner et al. 2014). The situation is not very different in Ghana where mental health conditions such as anxiety, stress, and depression are prevalent (Fordjour and Chan 2019).

The literature indicates that the management of construction mental health is challenging at best. Milner and Law (2017) for instance indicate that only few "systematic and evaluated" workplace mental well-being programs" exist, with what is available focusing mainly on the symptoms of poor mental health and less on "the positive aspects of mental health, such as well-being". Construction workers, especially males, are less likely to take advantage of mental healthcare interventions because of factors such as a "tough guy" attitude and stigmatization (Hon 2017). Others, such as Oude et al. (2013) and Taimela et al. (2008), have indicated that unlike in other industries, mental health programs do not produce any significant effects on "self-reported depression and mental health symptoms". Additionally, "programs involving smoking cessation, health promotion, and psychosocial skills training" do not produce any significant effects on construction workers (Lingard and Turner 2015; Milner and Law 2017).

3.2.1 Mental health conditions, outcomes, and risk factors

As in the case of physical health, young construction workers experience adverse mental health outcomes compared to their senior counterparts (ILO 2018). Common mental health conditions explored among young people include depression, anxiety, stress, suicide, and substance abuse disorders. Heller et al. (2007) examined the incidence and causes of suicide among young male construction workers (15 - 24 years) in Australia and observed that while construction workers in general had a higher

5 See Eyiah et al. 2019 for a detailed discussion.

6 See ILO 2018 for a detailed discussion.

risk of suicide compared to the general male population, young construction workers in particular had an overly heightened risk of suicide, which was about twice that of youth of a similar age in other industries. This was noteworthy considering that suicide rates for older construction workers were very similar to or slightly higher than the general Australian male population.

There is evidence that young entrants into the construction workforce are at a higher risk of substance abuse disorders, especially those related to alcohol and its adverse outcomes such as suicide and poor-quality life (Milner et al. 2014). Pidd et al. (2017) have examined the relationship between alcohol and drug use, psychological well-being, and workplace psychosocial environment among young apprentices in their first year of training in the Australian construction industry. The mean score for psychological distress reported was considerably higher than the national score for Australians of a similar age and gender. Additionally, Pidd et al. (2017) found that the use of drugs such as cannabis (44.4%) and methamphetamine (8.3%) in the past 12 months was significantly above the national prevalence data (25.3% cannabis; 3.3% methamphetamine) levels for Australians of similar age and gender.

Both academic[7] and non-academic construction training has also been found to be psychologically challenging period for young people. While studies have reported a higher rate of normal mental health and a lower rate of mental ill-health among built environment students, compared with students from other disciplines at the tertiary level, undergraduate built environment students in Australia have been identified to have levels of depression, stress, and anxiety, that are within the ranges for the general youth population (Scott-Young et al. 2018). Although no significant difference was reported between depression among male and female students, females were found to experience significantly higher levels of stress and anxiety *(ibid.).* Compared to local students, international students were found to experience significantly higher levels of anxiety and depression. Generally, findings for academic trainees were comparable with those for non-academic trainees and the general Australian population *(ibid.).*

Young construction workers are constantly exposed to a host of factors that adversely affect their mental health (Heller et al. 2007; Pidd et al 2017). Commonly identified categories of risk factors include physical conditions, school/training/work-related factors; interpersonal factors; and industry culture. In the case of young male construction workers (15 - 24 years) in Australia, Heller et al. (2007) identified a strong link between substance abuse disorders and individual factors, work-related factors, and industry culture. Heller et al. (2007) noted that these problems emanated from poor work outcomes such as intense financial strain, stressful work life, and a diminished social support system. A similar trend has been reported in the Ghanaian construction industry. A study by Fordjour et al. (2020), although not focusing exclusively on young workers, identified the most critical risk factors to be work related. These include lack of autonomy, pressure from tight deadlines, poor work conditions, overly demanding work supervisors, poor relationships with co-workers, poor communication, and unfair treatment.

3.2.2 Stakeholders of youth mental health

Research on active stakeholders of youth mental health has been limited to Australia, the UK, and the US (e.g., Turner et al. 2107). Those mentioned in the literature include employers, professional bodies, trade unions, and government agencies. Stakeholder activities included building resilience and coping skills of young people and their families; raising community awareness; improving capacity for early identification and referral to appropriate services; improving treatment to be more responsive to the early onset of mental illness among young people; and investing in research to better understand the onset and treatment of mental illnesses (Broadbent and Papadopoulos 2014; Turner et al. 2107). Although stakeholder

7 Kamardeen and Sunindijo (2018) consider this group to be construction employees.

activities are carried out collaboratively, peak professional construction industry bodies provide the impetus and leadership (Turner et al. 2107). Specific industry groups identified include contractors, clients, professional bodies, and trade unions. Although universities have been found to be instrumental in the promotion of mental health, Turner et al. (2017) did not find any evidence of the inclusion of mental health education in built environment academic programs. It appears that much of the effort from academic institutions is in the form of research.

3.3 OHS management approaches and challenges

In terms of research, attention to OHS management approaches and challenges focuses on the general construction workforce and not specifically on different age categories of workers. Also, many of the studies conducted are cross-sectional in nature and have focused predominantly on the case of on-site construction workers. Thus, the samples used are not representative of the overall activity of the construction workforce in different occupations and age groups and does not sufficiently address the consequences of construction work on the long-term health of different ages (Dong et al. 2015; Moyce and Schenker 2018). This notwithstanding, there is an abundance of recommendations aimed at helping firms to prevent construction injuries and promote health and safety. These include improving the work environment, managing work at both the personal and organizational level (e.g., reducing working time, increasing rest and sleep time); increasing the frequency of health examinations; provision of adequate compensation; and promotion of health and safety education (Leung et al. 2012; Fung et al. 2016).

Agyekum et al.'s (2018) study in Ghana revealed that Ghanaian construction firms have in-house OHS programmes that make use of some of the aforementioned recommendations. Notable elements include

> providing written and comprehensive safety and health plans; providing safety managers on site; introducing project-specific training and regular safety meetings; providing safety and health orientation training; involving employees in safety and evaluation, and emergency response planning (Agyekum et al. 2018 p.54)

The implementation of health and safety programmes in Ghana's construction industry is however fraught with many challenges. The most notable challenge is the poor enforcement of OHS regulations (Boadu et al. 2020; Eyiah et al. 2019). This challenge is caused by three main groups of factors viz.: *"employer-related factors"* (lack of employer commitment, lack of funds and high cost of OHS training and implementation, and logistical constraints); *"employee-related factors"* (workers' perceived inconvenience of OHS practices, lack of OHS training and education, laziness and negligence of workers); and *"institutional factors"* (lack of regulatory and supervisory capacity of industry institutions, non-prioritization of OHS by industry influencers, most construction firms operating outside the sphere professional influence) (Agyekum et al. 2018; Boadu et al. 2020; Eyiah et al. 2019). Almost all the monitoring of compliance with OHS standards is done at the firm level and not at the national or industrial level (Boadu et al. 2020; Laryea and Mensah 2010). Consistently, all studies conducted within the last 15 years on OHS management challenges in Ghana (i.e., from Kheni et al. 2006 to Boadu et al. 2020) attribute the persistence of negative performance to the lack of improvement in OHS legislation and enforcement.

4.0 Methods

4.1 Research design

A mixed-methods approach was used to address the research questions in this study. Primarily, mixed methods approaches are underpinned by pragmatism and therefore enable flexibility by allowing the use of different approaches to answer research questions. Secondly, a mixed methods design allows harnessing the advantages of both qualitative methods (i.e., small sample size, in depth data collection, etc.) and quantitative methods (large sample size, generalization, etc.) (Creswell and Plano-Clark 2007). Furthermore, mixed methods approach enables data triangulation, which provides a strong basis for enhancing the reliability of research findings (Hesse-Biber and Leavy 2008). Specifically, an "exploratory sequential" (Creswell and Plano Clark 2007) mixed methods design was employed in this research. This research was thus undertaken in two main phases. In the first phase, qualitative data on the research questions were analysed and used to develop the second (quantitative) phase which involved collecting and analyzing quantitative data.

4.2 Ethical considerations

Ethics approval (No.: 002/20) for this research was granted by the Ethical Review Committee (ERC) of Participatory Development Associates (PDA). The PDA Ethical Review Committee considered this research to have met the ethical requirements for research involving human participants and have low risk as it did not involve minors and did not deceive participants to elicit information. Important ethical considerations such as informed consent was addressed by providing participants with written invitations and information sheets on the nature, purpose, and potential uses of the research. Participants were assured that their anonymity would be ensured both during and after the study. Participants were also made to sign consent forms and made aware of their right to withdraw from the study at any time without any implications.

4.3 Data Collection

A comprehensive review of both academic (e.g., research journal publications) and non-academic literature (e.g., industry reports and policy documents) was undertaken to gain an understanding of the current state of research on youth health and safety in the construction industry. The review also provided secondary data that enabled the formulation of preliminary questions for the development of both qualitative and quantitative data collection instruments. Data for the study was collected during the months of September and October of 2020.

4.3.1 Qualitative data collection

Primary qualitative data was collected through semi-structured in-depth interviews with a purposefully selected sample of 21 different stakeholders of youth health and safety (e.g., construction workers, construction professionals, employers, mental health experts, researchers, etc.). Interview participants were required to provide information on common physical and mental health conditions of young workers as well as key information on stakeholders. All interviews were digitally recorded and lasted between 30 minutes and 1 hour. Interview data was transcribed verbatim, and a preliminary thematic analysis was subsequently carried out. Following this, a focus group comprising eight experts in youth health and safety was conducted to help with the development of a classification of construction youth health and safety stakeholders, refine and validate interview results, and to obtain further insights to augment the interview findings. Data from the interviews and focus group was then

used to develop a survey questionnaire for collecting quantitative data.

4.3.2 Quantitative data collection

The target population for the quantitative study was young people aged 18 to 35 years working in various trades and professions in different sectors of Ghana's construction industry. Questionnaires were initially pilot-tested with a sample of fifteen participants to identify issues in need of revision. Based on participants' concerns, the wording of some questions were revised to make them simpler and to reflect local understanding of concepts. Subsequently, the enumerators administered questionnaires on construction sites, offices, and workshops located in the three largest urban areas in Ghana (i.e., Accra/Tema, Kumasi, and Takoradi/Cape-Coast). These areas have the highest concentration of a wide variety of construction activity. The survey was also posted online to obtain responses from those outside the reach of the enumerators. A link to the online survey was advertised on different social media platforms and posted on construction workers' online groups for easy access. The survey included information on the purpose of the research and the rights of respondents. The questionnaires focused on four main areas: demographics, general health rating, physical health, mental health, and perspectives on stakeholders.

4.4 Data analysis

Qualitative data analysis began with the development of individual verbatim transcripts of all audio recordings from interviews (n=21) and the focus group (n=1). All field notes and debriefing notes were also expanded and attached to their respective transcripts. Transcripts were compared with one another, carefully revised, and combined into a single final report. Subsequently, a thematic content analysis of the final report was undertaken.

After the quantitative survey, 459 questionnaires were retrieved for analysis. A total of 445 useful questionnaires were retained for use[8]. This number is above the sample size used in most previous research (e.g., Fordjour et al. 2019; 2020) on construction health and safety in Ghana. Quantitative data was analyzed using statistical tools from IBM SPSS 23.0 (IBM Corporation 2019). Descriptive statistics were used to describe the study sample and the overall response pattern on study measures. The results from quantitative analysis were supported by qualitative findings.

4.5 Limitations

This study is not without limitations. Firstly, it is typical for self-reported physical and mental health conditions and outcomes to be underestimated by respondents. Given that the quantitative part of this study made use of a self-report survey therefore, the potential for socially attractive responses remains. Secondly, the scales used to measure mental health only estimate the presence of conditions at a superficial level and may require extensive follow-ups for further assessment. An in-depth exploration of the mental health conditions on an individual basis is therefore required to draw more robust conclusions. Also, in an attempt to get a clearer picture of the overall health of young construction workers, the presence of pre-existing conditions was not controlled for in the final prevalence analysis. This has the potential to obscure the real impact of construction on young workers' health. Thirdly, the study focused predominantly on young construction workers in urban and peri-urban areas of the three most populated regions in Ghana. The

8 The sample size calculation was based on the 2015 Labour Force Report published by the GSS in 2016. The figures captured by GSS 2016 for the construction industry are for on-site construction activities only. Off-site professional construction workers (e.g., architectural and engineering services) are captured under the services sector and elsewhere. GSS figures also exclude construction trainees, both in the formal and informal sectors. To make up for these gaps, an attempt was made to capture the overall number of young people employed in the construction and allied industries (e.g., real estate; professional, scientific, and technical sub-sector; water supply, sewage, and waste management; and electricity, gas, stream and A/C). This yielded a total population of 333,592 workers under 35 years of age. For such a largely heterogeneous population, given a sampling error of 5% (e = 0.05) and a variability of 50% (p=0.5), the minimum sample size calculation using Cochran's formula yielded 384 workers (95% confidence interval).

findings may therefore not reflect the situation of young construction workers in other parts of Ghana. Finally, considering that the sample was predominantly male, the findings may not reflect the true situation of female workers who are known to have somewhat different work-related health outcomes. These limitations notwithstanding, this study contributes novel findings and comparative understandings into the health of young construction workers in Ghana. Overall, the findings have direct relevance to young workers in other industries and countries with similar characteristics as Ghana's construction industry.

5.0 Results

5.1 Participants

Twenty-one participants with different backgrounds took part in the interviews. Participants were grouped into 6 main categories of construction youth health and safety stakeholders predetermined from the literature review (Table 1). A total of 8 participants were included in the focus group discussion. Details of the focus group composition is given in Table 2.

Table 1: Details of interview participants (n=21)

Stakeholder Group	Occupations	Number of participants
Young construction workers	Architect	1
	Trainee/apprentice	3
	Carpenter	1
	Steel bender	1
Healthcare	Medical doctor (public/occupational health)	1
	Nurse (mental health)	1
	Physician assistant (mental health)	1
	Pharmacist (traditional/herbal)	1
Health and safety regulatory agencies	Public health manager (physical and mental health)	1
	Factories safety authority inspector	1
	Construction safety authority inspector	2
Youth health activist/media	Journalist	1
Client/employer	Contractor	1
	Project manager	1
	Construction health and safety manager	1
Construction youth training institutions	Lecturer/researcher	1
	Health and safety trainer	1
	Construction workers association leader	1
Total		21

Table 2: Composition of expert focus group (n=8)

Stakeholder Group	Number of representatives	Affiliation/expertise
Youth health activists	1	CEO of private health innovation organization/public health expert
Construction youth trainers	1	University lecturer and researcher/ construction health and safety expert
Healthcare	1 1 1	Deputy director of public health management authority/ mental and physical health Principal physician assistant at regional mental health facility/ mental health Manager of medical services at a mining company/ occupational health and safety specialist
Construction Client, Employer, and Professional Group	1	Vice president of construction professional association/ construction management professional
Construction H&S Officer	1	Health and safety officer at manufacturing facility/ occupational health and safety specialist
Young construction workers	1	Recent graduate and quantity surveyor at municipal authority/ construction management and quantity surveying
Total	8	

The general characteristics of the entire sample (n = 445) from the quantitative survey are displayed in Table 3. Respondents' age ranged from 18 to 35 years, with the mean age of 26.3 years (SD = 5). Typical of the construction industry's male-dominated workforce in many countries (Turner and Lingard 2020), majority of the survey respondents were male (94.4%). Almost a third of the respondents reported being in a partnered relationship, and under 1% reported their marital status as either separated or divorced. More than half of the respondents (61.8%) reported having dependents, with the average number of dependents reported being two. The majority of respondents (97%) reported having received some form of formal education. It is important to note that 10 out of the 12 respondents who reported having no formal education had either informal or semi-formal education. This is somewhat reflective of the high youth literacy rate (92.49%: World Bank [2021]) in Ghana.

Table 3: Characteristics of the survey respondents (n=445)

Variable and category	N	Summary statistic (%)
Demographic characteristics		
Age		
18-23 years	153	34.4
24-29 years	159	35.7
30-35 years	133	29.9
Sex		
Female	25	5.6
Male	420	94.4
Marital status		
Never married	306	68.8
Cohabiting	43	9.7
Married	90	20.2
Separated	2	0.4
Divorced	4	0.9
Number of dependents		
None	170	38.2
1-5	244	54.8
6-10	28	6.3
>10	3	0.7
Education		
Primary	25	5.6
Junior high school	147	33.0
Senior high school/vocational/technical	145	32.6
Tertiary (university/polytechnic)	116	26.1
Non-academic (informal/semi-formal)	10	2.2
None	2	0.5

Table 3: Characteristics of the survey respondents (n=445) (contd.)

Variable and category	N	Summary statistic (%)
Occupation and socio-economic characteristics		
Work experience in construction		
≤ 1 year	109	24.5
2-5 years	189	42.5
6-10 years	96	21.6
>10 years	51	11.4
Primary occupation category		
Construction trades worker (mason; labourer; carpenter; etc.)	314	70.6
Construction professional (architect; engineer; construction manager; quantity surveyor; etc.)	131	29.4
Secondary occupation		
Yes	273	61.3
No	172	38.7
Work location		
On-site	174	39.1
Off-site	97	21.8
Both on and off-site	174	39.1
Work hours (per week)		
≤ 20 hours	10	2.2
21-40 hours	81	18.2
41-60 hours	271	60.9
>60 hours	83	18.7
Health and lifestyle characteristics		
Drug use without doctor's prescription		
No	131	29.4
Yes	314	70.6
Substance/alcohol abuse		
No	356	80.0
Yes	80	20.0

Table 3: Characteristics of the survey respondents (n=445) (contd.)

Variable and category	N	Summary statistic (%)
Health outcomes		
Overall physical health status at baseline		
Very poor	3	0.7
Poor	7	1.6
Fair	58	13.0
Good	194	43.6
Very good	183	41.1
Pre-existing/past physical ailments		
No	318	71.5
Yes	127	28.5
Overall mental health status at baseline		
Very poor	0	0.0
Poor	8	1.8
Fair	48	10.8
Good	183	41.1
Very good	206	46.3
Pre-existing/past mental ailments		
No	245	55.0
Yes	200	45.0

5.2 The physical health of young construction workers

5.2.1 Physical health at baseline

Most of the respondents (84.7%) reported having good physical health. About one-third of the respondents (n=127) however indicated that they had at least one existing condition or had suffered some significant physical ailments prior to entering into construction. The five main conditions reported were stomach problems, skin problems, sexual weakness, hypertension, and heart problems. No respondent reported ever having a stroke. Table 4 provides an overview of the prevalence levels of the respective physical health conditions reported.

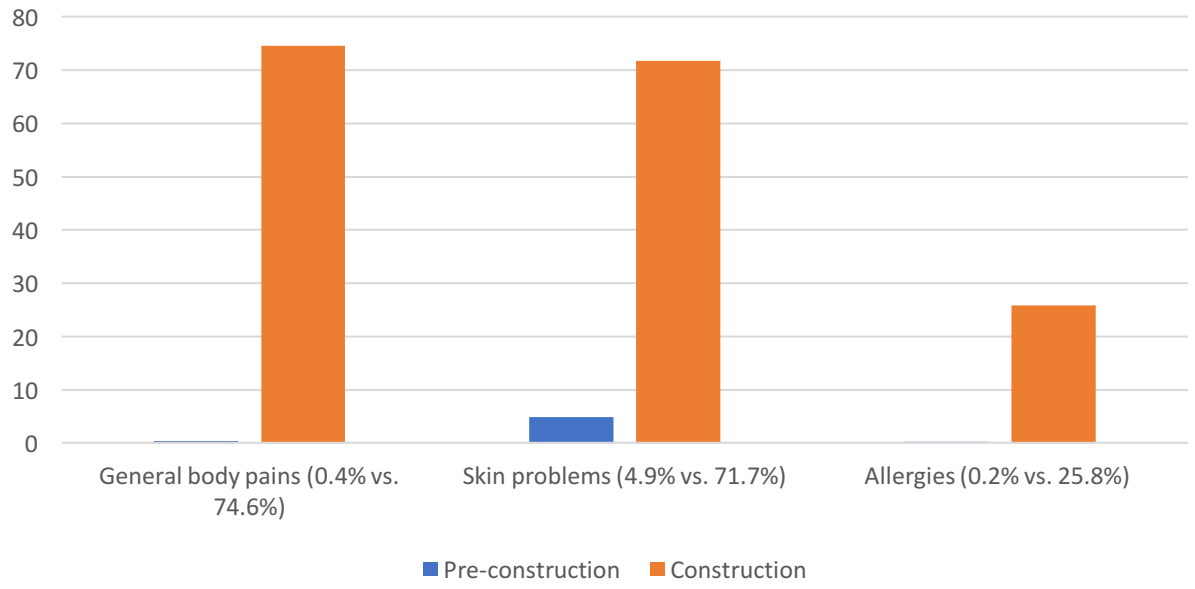
5.2.2 Work-related physical health conditions and outcomes

Common work-related physical health problems affecting young construction workers were problems related to the chest, eyes, skin, ear, sinus, headaches, allergies, and musculoskeletal disorders (general body pains, waist pain, back pain, joint pain, feet/leg pain, broken bones), and fatigue. The prevalence of these conditions among respondents was deduced from the question, “Have you ever had any physical health problem because of your work in construction?”. Almost all (99.6%) of respondents answered “Yes” to this question. Following this question, respondents had to answer the question “Do you have any of the

following physical health problems because of your work in construction"? Respondents were also asked whether their current physical health status affected activities such as lifting items and climbing heights. Details of the specific self-reported work-related physical health conditions and outcomes are presented in Table 5.

The main physical health conditions reported by the majority (above 50%) of workers were general body pains, extreme tiredness, skin abrasions and cuts, waist pain, back pain, and joint pain. Hearing problems and broken bones were the least reported problems. This indicates that the majority of the workers had multiple physical health conditions as a result of the work in construction. When pre-construction and construction prevalence levels are compared, three conditions which increased dramatically among workers are general body pains (0.4% vs. 74.6%), skin problems (4.9 vs. 71.7%), and allergies (0.2% vs. 25.8%) (See Figure 1).

Figure 1: Pre-construction versus construction prevalence levels for general body pains, skin problems, and allergies.



Although more than a quarter of the respondents reported that they had suffered eye-related problems, only a few reported having poor eyesight as a result. Incidents of ear-related problems and their attendant adverse consequences remained low among the respondents (8.4% vs. 1.8%).

Table 4: Pre-existing physical health conditions at baseline (N= 127)

Condition	N	Summary statistic (%)
Stomach problems		
No	74	58.3
Yes	53	41.7
Skin problems (excluding skin cancer)		
No	105	82.7
Yes	22	17.3
Sexual weakness		
No	108	85.0
Yes	19	15.0
Hypertension		
No	113	89.0
Yes	14	11.0
Heart problems		
No	117	92.1
Yes	10	7.9
Physical disability		
No	118	93.0
Yes	9	7.0
Liver problems (hepatitis/jaundice)		
No	121	95.3
Yes	6	4.7
Arthritis		
No	121	95.3
Yes	6	4.7
Chronic lung disease		
No	124	97.6
Yes	3	2.4
Kidney/bladder problems		
No	125	98.4
Yes	2	1.6
Diabetes		
No	125	98.4
Yes	2	1.6
High cholesterol		
No	125	98.4
Yes	2	1.6
Low blood pressure		
No	126	99.2
Yes	1	0.8
Cancers		
No	126	99.2
Yes	1	0.8
Others (including allergies, piles, sickle cell, eye problems, and anemia)		
No	104	81.9
Yes	22	18.1

Note: Some respondents had multiple conditions.

Table 5: Work-related physical health conditions and outcomes (n=445)

Variable and category	N	Summary statistic (%)
Health condition*		
General body pains	332	74.6
Extreme tiredness	330	74.2
Skin abrasions and cuts	319	71.7
Waist pain	270	59.3
Back pain	259	58.2
Joint pain	247	55.5
Frequent headaches	206	46.3
Sinus problems	195	43.8
Feet/leg pain	181	40.7
Chest pain	132	29.7
Eye problems	118	26.5
Allergies	115	25.8
Broken bones	43	9.5
Hearing problems	38	8.4
Health outcome		
Hearing status		
Poor	8	1.8
Fair	23	5.2
Good	148	33.3
Very good	266	59.8
Sight status		
Poor	15	3.4
Fair	59	13.3
Good	147	33.0
Very good	224	50.3
My health limits moderate activities (lifting items, etc.)	125	28.1
My health limits climbing stair, ladders, and other heights	89	20.0

Note: *Percentages do not sum up to 100 because some respondents had multiple conditions. Pre-existing conditions included. Frequencies shown are for respondents answering "Yes" to having each respective health condition.

Noteworthy however, are the proportions of workers whose physical activity were affected by their physical health. Almost one-third of the respondents reported that their physical health imposed some limitation on their engagement in moderate activities such as lifting items. One in five of the respondents reported that their physical health limited climbing stairs and ladders.

Figure 1: Pre-construction versus construction prevalence levels for general body pains, skin problems, and allergies

The focus group discussion revealed that the poor physical health conditions suffered by young construction workers were largely because many of them tend to be "casual workers who are mostly inexperienced and lack the pre-requisite training for ensuring their personal safety at work". Long working hours and falls from heights were also cited as common causes of extreme fatigue and musculoskeletal disorders, respectively. In addition to the prevalence rates for the different poor physical health conditions being of significant concern, a participant from the health group indicated that the prevalence rates and impacts of poor physical health among young construction workers *"are bound to worsen in later years because of the poor lifestyle of the general youth population", and specifically "the poor eating habits and help-seeking behaviour"* of young construction workers.

5.3 The mental health of young construction workers

5.3.1 Mental health at baseline

Most of the respondents (87.7%) reported having good mental health. Nonetheless, about 1 out of every 10 respondents indicated that they had multiple pre-existing mental health conditions (i.e., depression, anxiety disorder, and substance abuse disorder) which were current at the time of conducting this study. Table 6 provides an overview of respondents' mental health conditions at baseline and the sources of diagnosis.

Table 6: Pre-existing mental health conditions at baseline (n=445)

Condition	N	Summary statistic (%)
Depression	101	22.7
Source of diagnosis*		
Self	87	86.1
Family member	3	2.9
Friend	4	3.9
Workmate	1	1.0
Medical staff	6	6.1
Anxiety disorder	83	18.7
Source of diagnosis		
Self	80	96.4
Family member	1	1.2
Friend	1	1.2
Workmate	0	0.0
Medical staff	1	1.2
Substance use disorder	80	18.0
Source of diagnosis		
Self	75	93.7
Family member	2	2.5
Friend	2	2.5
Workmate	0	0.0
Medical staff	1	1.3

Note: Conditions reported by a few respondents are omitted. Percentages may not sum up to 100 because some respondents had multiple conditions. *Percentages for source of diagnosis are calculated based on total number reporting a specific condition.

5.3.2 Work-related mental health conditions and outcomes

The most prevalent mental health conditions among young construction workers were depression, anxiety, substance abuse disorders (abuse and addiction of cannabis, crack cocaine, tramadol, codeine, marijuana, other sedatives), and sleep problems. However, considering the scarcity of research on the mental health conditions of young construction workers in Ghana and elsewhere, it was deemed necessary to estimate the prevalence of a wide range of work-related mental health conditions. The adult version of the American Psychiatric Association (APA) DSM-5-Self-Rated Level 1 Cross-Cutting Symptom Measure was used to assess respondents for conditions including depression, mania, anxiety, somatic symptoms, suicidal ideation, schizophrenia, sleep problems, memory problems, repetitive thoughts and behaviours, dissociation, personality disorder,

and substance abuse disorder. Respondents were asked to indicate on a scale of 0 (not at all [none]) to 4 (nearly every day [severe]) how often they had been bothered by each of the stated problems during the past two weeks. Respondents were also asked whether their current metal health status limited the amount of work they were able to do. Table 7 provides an overview of the specific self-reported work-related mental health conditions and outcomes.

Table 7: Work-related mental health conditions and outcomes (n=445)

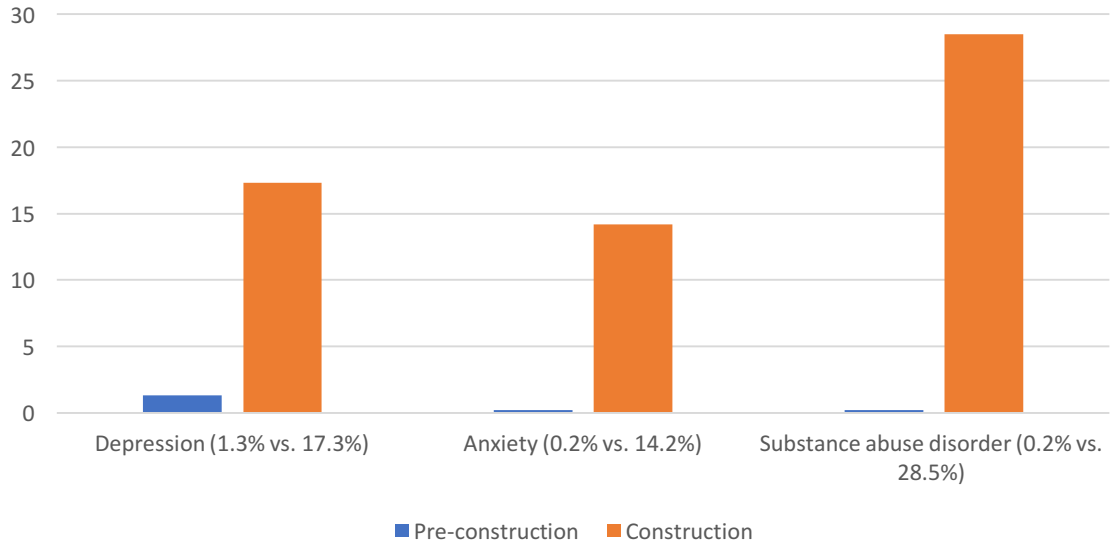
Variable and category	N	Summary statistic (%)
Health condition		
Mania	129	29.0
Substance abuse disorders	127	28.5
Somatic symptoms	81	18.2
Sleep problems	78	17.5
Depression	77	17.3
Anxiety disorder	63	14.2
Schizophrenia	62	13.9
Memory problems	50	11.2
Dissociation	50	11.2
Personality disorder	49	11.0
Repetitive thoughts and behaviours	40	9.0
Suicidal thoughts	28	6.3
Health outcome		
My health limits amount of work I am able to do	44	10.0
Number of days (during the past 30 days) I was unable to work or undertake normal activities because of my health*		
< 5 days	30	68.2
5-10 days	11	25.0
>10 days	3	6.8
(Not counting the above); number of days (during the past 30 days) I was able to do only half of what I would normally have been able to do because of my health*		
< 5 days	35	79.5
5-10 days	6	13.6
>10 days	3	6.9

Note: Percentages may not sum up to 100 because some respondents had multiple conditions. *Pre-existing conditions included. *Calculated out of (n=44) respondents reporting work limitations.

Many respondents reported that they had some form of work-related mental health problem. Conditions such as mania (an unusually high and excitable mood), substance abuse/addiction disorder, somatic symptoms (significant physical symptoms associated with poor mental health), sleep problems, depression, and anxiety disorder were in the top half of the list of prevalent mental health conditions. A comparison of medically diagnosed pre-construction and construction (work-related) prevalence levels indicates

a sharp rise in the cases of depression (1.3% vs. 17.3%), anxiety (0.2% vs. 14.2%), and substance abuse disorder (0.2% vs. 28.5%) (See Figure 2). One in every 10 of the respondents reported that their mental health limits how much work they are able to do, with the majority of these people (93.2%) not being able to work or engage in normal activities from one up to ten days in a month. Majority (79.5%) of these same respondents also indicated that for up to 5 days out of the remaining days in a month, they were only able to do half of what they would normally have been able to do if they were mentally healthy.

Figure 2: Construction versus pre-construction prevalence levels for specific mental health conditions



Common manic symptoms among the respondents included having more than normal energy despite little sleep (38%), being happier than usual, and having an unusually strong desire to engage in high-risk activities (33.2%). The most common substances abused by respondents were stimulants (sleeping pills: 28.5%). This could have a link with sleep problems which was among the top conditions reported by the respondents. Respondents reported low levels of use for pain killers (tramadol: 6.3%), alcohol (4.94%), and drugs such as marijuana, cocaine, or crack, heroin (1.3%). This was in line with findings from the focus group which suggested that workers generally do not self-report for illicit drugs because of the fear of being incriminated. According to an expert on the focus group panel:

"It is typical for workers who come for medical screening as part of their job application process to self-report that they do not use illegal drugs. However, when their blood samples are screened, most test positive for marijuana, crack cocaine, and heroin". [Occupational health specialist].

Somatic such as symptoms (i.e., unexplained aches and pains in the head, joints, abdomen, back, and legs) were common. Depressive symptoms included (feeling down and hopeless, feeling like a failure, and having little interest in doing things). Anxiety disorder (14.2%) and schizophrenia (13.9%), although not the highest, were reported among the respondents. Only a small number of respondents reported that they had experienced having suicidal thoughts (6.3%).

5.4 Stakeholders, roles, and young workers' preferences

Nine categories of active stakeholders of youth health in the construction industry were identified. Figure 3 presents the nine stakeholder groups, their respective components, and their roles.

Figure 3: Key stakeholders of youth health and safety in Ghana's construction industry

To ascertain respondents' stakeholder preferences, they were asked to indicate their level of agreement (i.e., from "1 = Strongly Disagree" to "7 = Strongly Agree") with a series of questions about each component under a stakeholder category (e.g., "Orthodox healthcare practitioners are the most authentic providers of occupational healthcare"). Positive responses for each component were summed up and used to calculate the mean score for each stakeholder category. Mean scores were then ranked to determine respondents' preferences for stakeholders (Table 8).

5.4.1 Health group

The healthcare group comprises regulatory agencies, public and private healthcare institutions, and individual practitioners who are responsible for the control and delivery of orthodox, traditional, and religious healthcare. This stakeholder category is also responsible for the development and implementation of wellbeing interventions for addressing youth health issues.

The orthodox component is the main state-approved stakeholder and is therefore backed by the most robust regulatory frameworks, well-established practice centers, and a large number of practitioners. Key statutory bodies in this domain include the Ministry of Health (MoH) and the Ghana Health Service (GHS).

Table 8: Young construction workers' stakeholder preferences (n=445)

Category and component	N	Summary statistic (%)	Mean Score (trimmed)	Rank
Health group				
Orthodox	390	87.6		
Public health agencies	246	55.3		
Spiritualists	75	16.8	268.0	7th
Herbalists	210	47.2		
Religious leaders and faith healers	226	50.8		
Occupational health and safety (OHS) agencies				
Regulatory bodies	187	42.0		
Training institutions	129	30.0	158.0	9th
Construction industry actors				
Project clients	319	71.7		
Employers/contractors/master craftsmen/trainers	380	85.4	350.3	5th
Professional associations and youth groups	327	73.5		
Workplace OHS practitioners	375	84.3		
Government				
Central government	161	36.2		
MMDAs and social welfare agencies	206	46.3	186.0	8th
Law enforcement agencies	191	42.9		
Academia				
Educational institutions	399	87.2	395.0	2nd
Teachers/lecturers/researchers	391	87.9		
Media				
Radio	404	90.1		
Information centers	393	88.3		
Television	399	89.7	395.5	1st
Newspapers and books	284	63.8		
Social media	386	86.7		
Youth health activists and promoters				
NGOs and other private organizations	411	92.4		
Social groups	387	87.0	369.3	3rd
Youth influencers	310	69.7		
Community				
Traditional leaders	324	72.8		
Community volunteers	395	88.8	332.3	6th
Families	322	72.4		
Friends	288	64.7		
Construction employees				
Individual workers	423	95.1	355.0	4th
Co-workers	287	64.5		

Note: Percentages do not sum up to 100 because all respondents had to separately rate each component. Mean scores are determined by summing up the total frequencies for the different components in each category and dividing the total by the number of components in the category.

Orthodox therapies are based on westernized medical practice, and they form state-approved interventions administered in the provision of mainstream medical care or physical ailments,

psychotherapy, counselling services, health and safety education, and workplace health support programs. Majority (87.6%) of the respondents felt that orthodox healthcare interventions were the most authentic in this category as far as the promotion of youth health was concerned. This notwithstanding, one of the focus group experts intimated that:

> *"After thoroughly assessing a client, you often find out that you are the last healthcare provider they are coming to seek help from"* [Occupational health specialist].

This statement gives credence to the fact that despite the popularity of orthodox medicine, traditional and religious components (e.g., herbalists [47.2%] and religious leaders and faith healers [50.8%]) are well entrenched and preferred by a significant number of young people. According to one interview participant, the level of acceptance for traditional remedies is revealed by statements such as *"if you can't help us, then no one else can"*, that are often uttered by clients during the administration of treatment. Key statutory bodies in this domain include the Traditional Medical Practitioners Council of Ghana, the Traditional Medical Directorate at the MoH, and the Ghana Federation of Traditional Medical Practitioners. Although healthcare provision by the religious and faith healers lacks proper regulation, many respondents agreed that they are important and should be made a key component of the youth OHS management system. A general challenge shared by this stakeholder group was "lack of adequate funding". "Apathy" on the part of regulatory agencies was a key challenge faced by traditional and religious stakeholders in particular.

5.4.2 Occupational health and safety agencies

This category includes regulatory bodies such as the Factories Inspectorate Division (FID) of Ghana and private OHS training institutions. The main role of the FID is to ensure compliance with public OHS legislation. Private OHS training institutions on the other hand are responsible for training and certification of OHS practitioners. Both stakeholders bear a measure of responsibility in providing public education on OHS issues. Irrespective of their legislative significance, our analysis revealed the presence of strong negative perceptions about this stakeholder category. According to one focus group participant:

> *"The [OHS regulatory bodies] are the least effective. Their offices are always empty, and people do not even know they exist. I visited their offices on several occasions to collect data for research but there was no one available to attend to me. If you do not believe me, try it yourself and see". [Construction OHS researcher].*

The validity of this observation was confirmed by the respective low ratings received by the stakeholders in this category and the fact that they were the least preferred (9th; mean = 158) category.

5.4.3 Construction industry actors

Construction industry actors comprise project clients, employers (contractors and consultants), master craftsmen/trainers, professional associations, construction youth groups, and workplace OHS practitioners. The most highly ranked component was employers (contractors and consultants) [85.4%], followed by workplace OHS practitioners (84.3%). This outcome supports the idea advanced by some interview and focus group participants that *"although there are no specific groups dedicated to managing"* the OHS of young construction workers, *"employers"* have direct oversight of construction workers and should be deemed the de-facto managers of the health and safety of young construction workers. Respondents believed that project clients, professional associations, and construction youth groups can promote the management of young construction workers OHS through advocacy and holding employers accountable.

5.4.4 Government

This stakeholder group is responsible for making laws, formulating policies for the protection of young people's health, providing funding for interventions (central government),

management of public healthcare resources (metropolitan, municipal, and district assemblies [MMDAs] and social welfare agencies), and ensuring that all stakeholders, especially individuals and construction firms, comply with broader and workplace safety legislation (law enforcement agencies e.g., Police, Narcotics Control Commission). The courts are also responsible for ensuring that adequate compensation agreements for workers are duly honoured. Although the government is seen as the main stakeholder of youth health and safety, it was among the least preferred categories (8th; mean = 186). The qualitative study indicated that negative perceptions exist about the government because of government agencies' "reputation for mismanagement of resources":

> *"Government agencies are over-reliant on funding from foreign donors. However, some of the foreign donors are now reluctant to help the government because they have begun realizing that government agencies consistently mismanage resources".* [Public health expert].

5.4.5 Academia

This stakeholder category includes educational institutions (both secondary and tertiary) and individual teachers, lecturers, and researchers. This group has the direct responsibility for OHS research and the training of construction workers and professionals. Stakeholders in this category face two key challenges in the performance of their roles. The first, according to one interviewee, is that *"courses on health and safety, especially mental health are not included in the school curriculum"*. Additionally, according to one focus group participant, *"research funding is low"*, resulting in *"low OHS research output compared to what is produced by institutions in developed countries"*. Despite this challenge, academia was the second most preferred (mean = 395.0) stakeholder. Many respondents felt that the school environment was the best place to learn about construction health and safety.

5.4.6 Media

The six components under media are radio, information centers, television, newspapers and electronic books, and social media. The role of the media is to contribute to public education through the dissemination of relevant information on health issues. The media was the top ranked (1st; mean = 395.5) stakeholder. Respondents however indicated that their least preferred media platform was newspapers and electronic books (63.8%). One interviewee noted that the mass media has very wide coverage and it is relatively easy to prepare media content on OHS because health consultants are always ready to provide help. Nonetheless, the interviewee lamented that producing OHS-related media content is beset with challenges such as "fake news" and "lack of sponsorship". Specifically:

> *"It is difficult to control what is going out, and fake news sells faster. Also, even though health is an important subject, there is poor sponsorship for health and safety programs because sponsors and the general public lack interest in it. I have found it easier raising massive sponsorship for programs related to sex and relationships than I have for health issues"*. [Journalist and youth health activist].

5.4.7 Youth health activists and promoters

This stakeholder was the third most preferred among the nine stakeholder categories. Non-governmental organizations (NGOs), other private organizations, and social groups play a very active and visible role in the promotion of youth-based health issues and have therefore earned the trust of young people and foreign donors. As a result, they have become one of the main vehicles through which foreign organizations are implementing youth-based health programs. Locally, NGOs and private organizations are making advances in sourcing of funding, business incubation, and undertaking research and development into youth-led health interventions (e.g., innovative digital technologies, formation of special interest groups, etc.).

The third component in this category, i.e., "youth influencers (celebrities/pace-setters/ etc.)" was not as highly preferred (69.7%) as the remaining components. One interviewee indicated that although they are popular and have wide appeal among young people, youth influencers tend to see advocacy programs as *"opportunities to make money and promote their personal brand"*. She noted that "this makes them less committed to the real task of positively influencing young people's health decisions".

5.4.8 Community

Community stakeholders such as traditional leaders, community volunteers, families and friends of young people play a crucial role by facilitating the activities of the health group, especially through spearheading intervention programs. Traditional leaders *"provide community resources and organize young people to benefit from public health and safety education campaigns"*. Community volunteers, friends, and family also play the role of caregivers. This stakeholder category was 6th (mean = 332.3) on the preference list of respondents. One interview participant indicated:

> *"This group is effective in the management of the health and safety of young people because they form the key part of young peoples' social network outside the workplace. The challenge faced by this group however is that they are self-funded and therefore limited in their impact both within and beyond their communities."*

5.4.9 Construction employees

Construction employees were the fourth (mean = 355.0) preferred stakeholder category. Main roles of this stakeholder category include ensuring personal and group compliance with OHS procedures, and assisting other stakeholders, especially employers to ensure a safe work environment. The qualitative data analysis revealed that young construction workers considered that they ought to be regarded as key stakeholders. Similarly, from the survey results, most respondents (95.1%) felt that if their health and safety were to see any relevant improvement, they ought to be given more opportunities and resources to determine their job conditions and how their health and safety was managed.

6.0 Discussion

6.1 The physical and mental health condition of young construction workers

6.1.1 Physical health

The findings of this study confirm that the pressures that young people face in construction has to multiple physical effects on their bodies. The most common physical health issues affecting most young construction workers were general body pains (74.7%), followed closely by extreme tiredness (74.2%), skin abrasions and cuts (71.7), waist pain (59.3%), back pain (58.2%), and joint pain (55.5%). This indicates that musculoskeletal bodily pains and injuries are the most prevalent physical health conditions suffered by young construction workers in Ghana's construction industry.

The prevalence levels of poor physical health conditions reported in this study are higher than those reported in recent studies conducted in construction industries of other countries in the Global South (c.f. Adhikary et al. 2018). This discrepancy could be influenced by differences in sample characteristics such as age or educational background on the quality of responses obtained. The findings of this study are however consistent with prevalence levels in the construction industries of developed economies such as the USA (Anton et al. 2020; Dong et al. 2015) and Australia (Turner and Lingard 2020). In their study of new masonry apprentices, Anton et al. (2020) for example, found that more than 70% of the respondents reported musculoskeletal disorders (MSDs) in several body regions including the lower back and the hands. Considering that it is common for many construction workers to underreport their injuries (Dong et al. 2011), the possibility exists that prevalence levels of poor physical health among young construction workers reported in this study and others could be worse.

The findings of this study have a number of implications. First, they give an indication of the kind of hazards that young construction workers are subjected to at work. The high prevalence of MSDs and skin-related problems reported in this study could indicate that young construction workers are mostly subjected to safety hazards emanating from a lack or non-use of proper protective clothing, use of dangerous equipment and machinery, working in trenches and at high levels, working near or operating machinery, and working with sharp objects, abrasive or flammable substances (ILO 2018). With many Ghanaian construction employers not providing the necessary tools and equipment for workers, and the construction industry's overreliance on "labour intensive methods" (Boadu et al. 2020), it is also highly possible that young workers could be exposed to ergonomic hazards originating from lifting and carrying heavy loads, putting down objects, working with old or poorly designed equipment, assuming awkward postures, and undertaking activities that require fast or repetitive movements (ILO 2018). Further research is required to confirm these.

Second, the findings of this study give an indication of the possible health outcomes for many young construction workers in Ghana. Recent studies have shown that poor work-related physical health, if left unchecked, can lead to death among young people. For example, in the US alone, an average of 770 deaths occur annually from ergonomic hazards associated with the use of heavy construction machinery and equipment (Moyce and Schenker 2018). In this study, it was identified that due to poor work-related physical health conditions, between 1 to 3 out of 10 workers had difficulty engaging in moderate activities such as climbing and lifting objects. Since these are

typical activities done by almost all construction workers (Safe Work Australia 2019), failure to fulfill them may make construction workers have to struggle with simple work tasks, deal with constant pain, and engage in absenteeism, thus ultimately making them unemployable. Having to grapple with reduced "work ability" and its potential consequences of stigma and poor-quality life can be secondary psychosocial risk factors which may lead to diminished mental health and ultimately suicide (Turner and Lingard 2020).

6.1.2 Mental health

The most common mental health problems suffered by young construction works in the recent past were mania (29%), followed closely by substance abuse/addiction disorder (28.5%), somatic symptoms (18.2%), sleep problems (17.5%), depression (17.3%), anxiety disorder (14.2%), and schizophrenia (13.9%). These prevalence levels reported are similar to results from recent studies in other Global South countries (e.g., about an average of 25% for Nepal; and some countries in the Middle East: Adhikary et al. 2018). When compared with a recent study from Australia (i.e., Ross et al. 2020), aside depression which is higher (30%), overall prevalence levels identified for a number of conditions are similar or slightly higher for Ghana (e.g., severe mental illness [13%] vs schizophrenia [13.9%]).

These results have some implications for the management of the mental health of young construction workers. First, the high prevalence of mania among the respondents could have a link with substance use and abuse. Most of those reporting substance abuse indicated they used drugs to deal with work-related challenges such as sleep problems, bodily pains, and to boost energy levels required to work for long hours (about 80% of the respondents worked between 41 to above 60 hours a week). Nonetheless, the evidence base in this study for making a firm conclusion on this matter is rather tenuous and considering that there is still conflicting evidence on the association between workplace stress and substance use (compare Chapman et al. 2020 with Bowen et al., 2014; Pidd et al. 2017), further research is required to fully understand the issue of drug use among young construction workers.

Additionally, besides depression, anxiety, stress, substance abuse, and suicide which have often been the major talking points of the mental health discourse, there are other severe mental health conditions affecting young construction workers that ought to be given critical attention. Somatic disorders (physical health disorders associated with poor mental health), for example, ranked third in terms of prevalence among young construction workers. Past studies indicate that somatic problems are common among young construction workers in other countries. Dong (2018), for example, found a significant prevalence among migrant male workers in the Chinese construction industry. Dong (2018) indicated that the prevalence of somatic disorders was linked with psychological distress brought about by poor living conditions, malnutrition, and low "urban fitness". Similar prevalence levels have been reported in the broader mental health literature on young people in countries of Sub-Saharan Africa (e.g., Nyundo et al. 2020) and Asia (e.g., Samuels et al. 2018). This could indicate that the issues of malnutrition and poor working and living conditions, which are typical in Global South countries, could be strong underlying issues for the high prevalence of somatic disorders. To get a clearer picture of the situation however, more studies are required. More research should also be conducted on conditions such as sleep problems and schizophrenia which have been described as severe mental health conditions common among young people in Sub-Saharan Africa (Demming et al. 2009).

Moreover, over 80% of the respondents resorted to self-diagnosis in the determination of their mental health problems, with some others resorting to either close family or close friends (6%). Only 1% and 6.1% of respondents made use of workmates or medical professionals for diagnosis, respectively. Medical professionals were often the last point of contact during the help-seeking process. These findings are consistent with other studies that have reported on the help-seeking behaviour of young workers in construction industries of both the Global

North and South. Adhikary et al. (2018) for instance reported that male migrant Nepalese construction workers in Malaysia, Saudi Arabia, and Qatar preferred to rely on their social group for support to deal with mental health problems. Studies in Australia (e.g., King et al. 2019) have shown that many young construction workers with mental health problems do not seek formal or professional help, but rather prefer self-help or in the worst-case resort to the use of informal sources such as family and friends. In explaining the cause of this phenomenon, the focus group discussion revealed financial problems as a key cause. Research from other jurisdictions, for example Australia, suggests that many young construction workers perceive their employers or superiors at the workplace to care less about mental health problems and more about physical health. They also see seeking help from a co-worker as "embarrassing and drawing unwanted attention" (the Australian Institute for Suicide Research and Prevention [AISRP] 2018). Nonetheless, the process of help-seeking is a complex one which is influenced by a host of factors including "salient age differences in approaches" (Farrer et al. 2008; King et al.2019). Further research is therefore required to fully understand the patterns of help-seeking among young people and the complex decision-making processes involved therein.

Finally, poor work-related mental health conditions had an adverse effect on the work ability of about 1 in 10 of the respondents, keeping most of them out of work for up to 5 days every month. Thus, just as in the case of poor physical health, workers with mental ill-health suffer reduced "work ability" which can lead to poor employment outcomes, and consequently low-quality life and suicide (Turner and Lingard 2020).

6.2 Stakeholders of youth health and young construction workers' preferences

While previous studies (e.g., Donkoh and Aboagye-Nimo 2017; Fugar and Agyakwah-Baah 2010; Turner et al. 2017) have looked at the issue of stakeholders separately in terms of mental and physical health, this study, guided by the fact that young construction workers are exposed to both physical and mental strains at work, extends previous work by presenting a combined stakeholder classification. Nine stakeholder groups were identified, viz.: (in order of preference) media, academia, youth health activists and promoters, construction employees, construction industry actors, community, health group, government, OHS agencies. This is consistent with stakeholder compositions in the broader literature on youth health in the Global South (Goodman 1997; Lee et al. 2009). The physical and mental health conditions identified, as well as young workers' stakeholder preferences have some implications for the activities of stakeholders in the industry and beyond.

Firstly, significant numbers of respondents indicated that they had work-related physical and mental health problems. This notwithstanding, many of the respondents, despite having poor physical and mental health, rated their physical and mental health status to be good at the beginning of the survey. A similar trend has been reported in other studies (e.g., Pidd et al. 2017; Adhikary et al. 2018), and this could indicate that many young construction workers have poor health literacy and are thus oblivious of the symptoms of poor health (Pidd et al. 2017). It is therefore imperative for stakeholders, especially the health group, the media, academia, and youth health activists and promoters to develop and implement programs aimed at boosting the OHS literacy among young workers. A key focal point should be on the preferences of young people and how to encourage them to use available support based on their preferences. The media, academia, and youth health activists and promoters can get leverage through the use of non-print media such as social media platforms and other online sources since these resources

are rapidly emerging as the main help-seeking avenues preferred by young people (Odgers and Jensen 2020).

Secondly, this study includes young construction workers (they are in the top half of the stakeholder ranking and are categorized under construction employees) as stakeholders and indicates that they play several key roles (e.g., ensuring personal compliance, as well as compliance of other youth, to safety regulations; offering support for their peers in terms of health and safety literacy, emotional, and physical support; and providing vital feedback to those responsible for health and safety management). The consideration of young workers as key stakeholders is in conflict with some views in the literature about the inclusion of young construction employees as stakeholders. Turner et al. (2017), for instance, although acknowledging the critical role played by young workers, did not classify them as key stakeholders because of the issue of "low" job autonomy. The ILO (2018) on the other hand classified young construction workers as stakeholders, albeit not clearly specifying their roles in the health and safety management process. Despite the issues of low job autonomy and their poor rates of OHS literacy, the inclusion of young workers as stakeholders is plausible because past research has shown that they have a higher capacity than older workers to respond positively to workplace health interventions (e.g., suicide prevention programs [Ross et al. 2020]). Young workers for instance seriously consider mental health to be a workplace health issue and therefore have a better potential for supporting themselves and others to achieve greater "intervention-associated change" (King et al. 2019). This is an indication that for interventions to be successful, they ought to be developed and implemented such that they are largely driven by young people themselves.

Thirdly, the respondents' perception that the government is not serious and the consequent low preference for the government is a matter of serious concern since the government is invariably the overarching stakeholder of youth health. Respondents' low preference for the government could be because stakeholder activity in many Global South countries is constrained by governments' inadequate fulfillment their responsibility toward youth health and safety (Kieling et al. 2011). In most Global South countries, there is an absence of a dedicated government agency responsible for managing young people's health (ibid.). Furthermore, it has been reported that most Global South governments do not allocate any funding for the promotion of youth health (Belfer and Saxena 2006). Consistent with the extant literature (see e.g., Belfer and Saxena 2006; Miller 2006), this study confirmed the government's overdependence on support from external donors and non-governmental organizations. This study also confirmed the government's posture to have a knock-on effect on mental healthcare in two areas, viz.: health professionals, especially those in the public sector, often have to use their personal resources to support young people's mental health initiatives (Belfer and Saxena 2006); and there is a low prioritization of mental health research (Kieling et al. 2011) in Ghana's construction industry. These findings give a strong indication that the government needs to take practical steps to shore up its image as far the management of youth health within and without the construction industry is concerned.

7.0 Recommendations

Following the rapid economic growth (as in many emerging economies of the Global South), Ghana's construction industry is growing steadily and employing many young people. It is therefore crucial to address the problem of poor youth health in the construction industry if the real benefits of construction work to youth employment and to the economy are to be achieved. As a direct response to this issue, the following recommendations are outlined for the different stakeholders:

7.1 Construction industry actors, academia, and OHS agencies

- Considering that industry actors have a high level of preference among young workers it is imperative for the Ghana Chamber of Construction Industry to set up a special committee to provide the co-ordination and monitoring required for all stakeholders to play their roles effectively.
- Construction workers associations and industry unions (e.g., Ghana Chamber of Construction Industry, Ghana Institution of Surveyors, Ghana Institution of Engineers, The Chartered Institute of Building, Association of Building and Civil Engineering Contractors, etc.) must take the first step in collaborating with government and academia to ensure the inclusion of health and safety training, especially mental health, in the education curriculum (i.e., built environments courses; technical and vocational courses) of secondary and tertiary institutions. Informal training for artisans and craftsmen should also include health and safety education. Furthermore, this group should advocate for the training and licensing of non-specialist workforce dedicated to helping young people at the workplace.
- Academic institutions (e.g., built environment and health faculties in universities) and built environment research organizations (Building and Road Research Institute) should increase research output on the health and safety of young construction workers (e.g., development of a common and locally acceptable language for communicating about health and safety conditions; development of workplace wellbeing programs; exploration of issues affecting students and apprentices; suicide prevention; substance abuse; coping mechanisms; etc.).
- Academic institutions and OHS agencies should collaborate with construction employers to redesign working processes and improve the workplace environment to be responsive to the critical issues (i.e., such as stage of physical development, limited job skills and work experience, discrimination, stigma, lack of supervision, and poor understanding of safety issues) affecting young people's health and safety.
- When engaging young construction workers, recruiters and employers should be open about the real working conditions in the industry and what they can realistically offer young people in terms of their rights and responsibilities, wages, amount of work time, prescribed employee conduct, etc. In this regard, particular attention should be paid to the role of master craftsmen who are responsible for the training of a significant portion of young construction workers in the construction industry who work in the informal sector of the construction industry.

7.2 Government

- Lawmakers should review current OHS legislation to address the specific case of young workers' health and safety in the construction industry and strengthen mechanisms for ensuring compliance with OHS regulations.
- Develop and implement a common policy framework for managing youth health and safety in the construction industry. The framework should seek to achieve a coordinated stakeholder effort through the promotion of multi-stakeholder collaboration. The framework should also seek to bolster young construction workers' involvement in the management of their health by recognizing them as key stakeholders and addressing any ethical and logistical challenges to research involving young people.
- Increase support and approval for the dissemination of knowledge on the viability and availability of non-orthodox alternative healthcare options for the management of work-related health problems.
- Increase funding available to academia for research and development of innovative mechanisms for improving the management of youth health in the construction industry.

7.3 Health group, community, and construction employees

- All members of this stakeholder group should collaborate to develop community-based approaches for promoting good youth health and safety practices. Approaches should seek to develop the skills of parents, young people, community leaders, volunteers, and others in the development of confidence for interacting with health professionals. Community and construction employees should be helped to develop confidence for engaging other stakeholders, and the skills for providing emotional support, early identification of poor health symptoms, and encouraging young people to seek appropriate for help-seeking services.
- Public health regulatory agencies (e.g., Ministry of Health, Ghana Health Service, Mental Health Authority, etc.) should collaborate with construction industry actors, academia, and OHS agencies by granting accreditation and licensing for the development and implementation of training programs for non-specialist health and safety workforce (e.g., mental health first aiders).
- All healthcare providers must learn the skills required to properly engage young construction workers in order to provide treatment and support that adequately responds to their needs. They must also collaborate with other stakeholders to train and supervise non-specialist health and safety workforce (e.g., mental health first aiders).
- The orthodox healthcare group must contribute to governments' effort of increasing support and approval of non-orthodox healthcare options as alternatives for the management of work-related health problems.

7.4 Youth health activists and promoters, and media organizations

- Youth influencers, youth-focused NGOs, and other private organizations (e.g., Participatory Development Associates, Global Communities, the Youth Sector Engagement Group) must collaborate with construction industry actors (especially youth groups of the construction workers associations) to spearhead the formation of a special interest group for encouraging networking and health communication among young people.
- NGOs and other private organizations should team up with construction industry actors, academia, and OHS agencies in the research and development of wellbeing programs (web-based, mobile apps, workplace-implemented, etc.) that

can guide and support young construction workers throughout their training and as they move into construction work.

- Youth influencers and the media should develop and use non-print digital media platforms (e.g., social media, mobile apps, radio, etc.) to disseminate vital information required to improve health and safety literacy, especially mental health, among employers, young workers, and any other relevant groups.
- All stakeholders in this group should identify and promote influential people who can champion youth health and safety at the local level and influence national and international policy direction on the subject of youth health and safety in the construction industry.

8.0 Conclusion

Construction work serves as an important source of livelihood for many young people. Nonetheless, engaging in construction can adversely affect the health of young people. The aim of this study was therefore to explore the health conditions of young construction workers in Ghana and to identify the stakeholders responsible for youth health and safety in Ghana's construction industry. Through a mixed methods approach, the study led to obtaining results that point to a high prevalence of poor physical health conditions (general body pains, extreme tiredness, skin abrasions and cuts, waist pain, back pain, and joint pain) and poor mental health conditions (mania, substance abuse/addiction disorder, somatic symptoms, sleep problems, depression, and anxiety disorder).

Based on the findings, it can be concluded that young construction workers suffer multiple physical and mental conditions as they have to endure both physical and mental strain at work. The high prevalence levels of the identified conditions leave significant potential concerns around the poor physical and mental health and their impacts such substance abuse, low work-ability, poor quality life, and in the long run suicide among the youth population in Ghana's construction industry. Considering that a substantial proportion of the respondents did not readily recognize the symptoms of poor physical and mental health, and the adverse effects of construction work on their overall health, young construction workers need more guidance and support throughout their training and working years. To adequately address this task therefore, the nine stakeholder groups, with leadership from the Ghana Chamber of Construction Industry must collaborate to develop specific frameworks for guiding research and practice in the management of youth health in the construction industry.

9.0 Areas for further study

Several questions surface in the light of the conclusions and the limitations of this study. For instance, what are the effects of each of the identified health conditions on the health outcomes and general well-being of young construction workers? What specific physical and psychosocial risk factors give rise to the health conditions identified and how do young people cope with them? What are the specific supportive or inhibitory factors that affect young peoples' coping? What are the costs to construction businesses and the economy of the poor health of young construction workers? In scarce resource environments like Ghana and other Global South countries, what specific configuration and prioritization of the identified stakeholders and stakeholder roles should be at play to manage youth health efficiently and effectively in the construction industry? Only when these questions and other related ones have received fuller consideration will it be possible to further validate, refine, and expand this study. Future research should therefore aim to address these questions.

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Data availability statement

All data used in the study and any additional information from this study may be obtained by contacting the authors.

Notes

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Participatory Development Associates Ltd.
... everyone matters

Youth Sector Engagement Group

30, Asafoatse Oman Street
(near Central View Hotel),
Kokomlemle, Accra
+233 (0)32 2061090/9

PDA GHANA @pdaghana