

# Impact of Ageism on the Mental and Physical Health of Construction Workforce

James O. Kereri<sup>1</sup> and Getrude K. Nyang'au<sup>2</sup>

<sup>1</sup>Assistant Teaching Professor, Department of Civil Engineering, University of Missouri, E2437Q Lafferre Hall, Columbia, MO 65211, E-mail: jkereri@missouri.edu (corresponding author).

<sup>2</sup>Graduate Instructor, Department of Human Development and Family Science, University of Missouri, Gwynn Hall, Columbia, MO 65211, E-mail: gknhq@missouri.edu

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**Abstract:** Despite the growing emphasis on workplace diversity and inclusion, ageism remains prevalent in various industries, including construction. Through an extensive review of literature and a United States national-level survey, this paper investigates the adverse impacts of ageism on the overall well-being of the construction workforce, focusing on their mental and physical health. The questionnaire was distributed among individuals working in the construction industry sector who were randomly selected and received 72 responses. The data obtained were analyzed statistically using binomial logistic regression in modeling the relationship between ageism, and mental and physical health of the construction workforce. The research results indicate that ageism has a statistically significant ( $p < .001$ ) positive relationship between both the mental and physical health of the construction workforce. The results, therefore, show that ageism has an impact on the mental and physical well-being of workers in the construction industry. Furthermore, the results show that individuals in the construction workforce who experience ageism are more likely to have their mental health and physical well-being impacted compared to those who don't experience ageism. Consequently, the results highlight the need for proactive measures to combat age discrimination and promote a healthier and more inclusive work environment for construction workers of all ages.

**Keywords:** Ageism, mental health, physical health, construction workforce, construction industry.

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## 1. Introduction

Ageism is defined as prejudicial attitudes, stereotypes, and discriminatory practices based on age (Bae and Choi, 2023; Gvili and Bodner, 2023; Nelson, 2016). Ageism is a social issue that affects various aspects of the lives of both young and old individuals. Of consideration is workplace ageism which can be experienced in any sector of the economy. As such, individuals working in the construction industry can also experience detrimental effects of ageism. The construction industry is characterized by unique challenges such as physically demanding labor (Zhang and Lin, 2023), experience, and technology use (Brell-Cokcan et al., 2023). These characteristics are often associated with youth and vitality while on the other end lies the question of experience.

Most existing research approaches ageism as a problem encountered by individuals aged 50 and above (e.g., Previtali et al., 2022; Berger, 2021; Cebola et al., 2021). However, varied research has also shown that ageism is a problem experienced by millennials as well. For example, younger employees are perceived to be disloyal, inexperienced, unmotivated, irresponsible, and immature (Marchiondo et al., 2016) while older employees are described as inactive, forgetful, and old-fashioned (Raymer et al., 2017). Statistics show that between 1997 and 2018, an approximated number of 423,000 U.S. workers filed age discrimination claims with the Equal Employment Opportunity Commission (EEOC), which is 22% of the workplace discrimination claims (Joe, 2019). Out of this, 205,000 cases were reported between 2010 and 2018 showing an upward trend in ageism cases (Kolmer, 2021). Furthermore, from the arguments presented in the existing literature, it is evident that ageism research focusing on workers over 50 years is the most common. This research, therefore, is limited to ageism against older workers.

Research by Levy (2001) introduced a clear admission regarding the existence of ageism not solely on how one age group is treated by another but also as the "enemy within". This implies that ageism is often implicit and aimed at oneself.

It happens without our knowledge or intention, and it has a direct impact on our social interactions and lives. Ageism, according to this definition, has attitudinal, behavioral, and components of emotion founded on chronological age. It is often argued that ageism influences the majority of interactions older adults face at the workplace. Additionally, research has shown that negative ageist messages have been instilled in older adults throughout their lives. This affects their perception of themselves and those around them (Levy and Banaji, 2002; Levy, 2001). Everyone who ages is prone to some form of ageist acts at some instance in their lives. This is distinct from other forms of discrimination (such as race, gender, and disability), which are unlikely to affect all members of society (Palmore, 2001). As a result, the extent and magnitude of ageism are immense (Ayalon, 2014; Ayalon, 2015).

Most implicit age-related biases are considered normal (Levy and Banaji, 2002). The perpetrators consider their actions and behaviors justified, while the victims do not consider themselves victims (Ojala et al., 2016). Just like any other workplace, it is becoming common that the construction industry has continued treating older adults with the same prejudicial attitudes towards old age and the entire aging process. Older workers are victims of discriminatory practices, including institutional policies and practices that perpetuate stereotypic beliefs about older employees, reducing their opportunities for a satisfactory life in employment, and undermining their dignity (Kimmel, 1988).

A growing number of research has linked ageism to adverse effects on the mental and physical health of older adults (e.g., Ribeiro-Gonçalves et al., 2023; Kang and Kim, 2022; Ayalon, et al., 2019). However, most of these articles are systematic reviews focusing on the general population and not specifically workplace ageism. Particularly, a focus on ageism and its impact on the mental and physical health of the construction workforce is deficient. Consequently, quantitative empirical studies in this area are timely. The aim of this paper, therefore, is to explore the impact of ageism on the mental and physical health of the construction workforce using data collected through a United States national-level survey. The survey was used to collect respondent views on the ageist practices experienced by themselves or observed ageism directed at their colleagues by their employers or fellow colleagues, and the impact that this has on their mental and physical health. These were used as variables in the study. The contribution of this research is to provide a novel understanding of ageism in the construction industry and its impact on the mental and physical health of the construction workforce. These findings will be helpful to construction safety managers and other safety practitioners in the construction industry to better understand the emerging issue of ageism and incorporate it into their safety protocols within their organizations.

## **2. Methods**

### **2.1. Survey Development**

In this study, a cross-sectional survey design was employed to investigate the state of ageism in the construction industry. A survey was conducted in the United States among individuals working in the construction industry sector. The development of the survey questionnaire was based on an in-depth review of the literature that guided the establishment of relevant variables. To ensure the questionnaire's validity, it was tested and piloted with experts in ageism and quantitative research, incorporating their feedback to make necessary improvements. The revised questionnaire was then administered online through Google Forms.

The questionnaire consisted of two sections: 1) included questions on general participant information, including age, gender, ethnicity, and department within their organization, and 2) focused on participants' opinions and experiences of ageism in the workplace, including instances of personal experiences, and witnessed ageist practices from employers or colleagues. Survey participants were also asked to assess how colleagues treated each other based on age. Additionally, survey participants provided information on their perceived impact of ageism and ageist practices on the mental and physical well-being of older workers.

### **2.2. Data Collection**

Data collection involved the administration of 285 online survey questionnaires using Google Forms. Cluster sampling was done through a Google search of construction companies based on the four census bureau-designated regions (i.e., Northeast, Midwest, South, and West). Then 15 companies from each region were randomly selected and contacted via email and asked for their willingness to ask their employees to participate in the study. The researchers used the contact list provided by companies who showed a willingness to participate in the research to contact the participants and then provided a link to the survey. The survey was conducted in January 2023 and was open for three weeks. At the end of the survey period, 72 participants completed the survey, resulting in a response rate of 25%. This response rate falls within the acceptable range for construction management research. According to Root and Blismas (2003), the normal response rate in construction research is around 20-30 percent. It is also important to note that statistical analysis of the data won't be a problem for any sample size greater than 30 because the central limit theorem is not violated (Hwang, et al., 2014). Top of Form

### **2.3. Data Analysis**

The collected data were analyzed using appropriate statistical methods to explore the relationship between ageism and its impact on the mental and physical health of the construction workforce. Data analysis utilizes binomial logistic regression in modeling the relationship between ageism and, mental and physical health of the construction workforce. In Eq. (1), MH is mental health modeled as a function of Ag which is ageism. Similarly, in Eq. (2), PH is physical health modeled as a function of Ag which is ageism. The ageism variable has only two possible values, with a 0 value representing a situation where ageism is not manifested and a value of 1 representing where it is manifested. The probability  $P(MH = 1)$  and  $P(PH = 1)$  is the probability of experiencing mental and physical health issues respectively, contrary to a 0 value, which indicates

no mental and physical health impacts. Logistic regression coefficients for single predictor variables in this paper  $\beta_0$  and  $\beta_1$  are established by fitting the logistic regression model shown in Eqs (1) and (2) to the collected data.

$$P(MH=1) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 Ag)}} \tag{1}$$

$$P(PH=1) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 Ag)}} \tag{2}$$

The statistical significance of the overall models and logistic regression coefficients were tested after fitting the data to Eqs (1) and (2). This was done by examining the standard errors for the logistic coefficients and using  $p$ -values to test the null hypothesis that the logistic coefficient is zero. A coefficient of zero would indicate no correlation of statistical significance exists between ageism and mental and physical health.

### 2.4. Model Interpretation

Logistic regression coefficients, unlike regular ordinary least squares (OLS) coefficients, are in log-odds units and require a different interpretation. To address this challenge, regression coefficients are often converted to odds (Kereri, 2020). When  $Ag = 1$  (indicating experienced ageism), the odds are computed using Eq. (3) and Eq. (5) for mental health and physical health respectfully. On the other hand, when  $Ag = 0$  (indicating no ageism), the odds are calculated using Eq. (4) and Eq. (6) for mental health and physical health respectfully.

To compare the odds of the two situations (i.e.,  $Ag = 0$  and  $Ag = 1$ ), the odds ratio (OR) is calculated using Eq. (7). This ratio is an indication of how much more likely it is for either the mental or physical health of the construction workforce to be impacted when one experiences ageism, compared to when it is not experienced. Importantly, the formula for calculating OR can also be computed by exponentiating the logistic coefficient,  $\beta_1$ .

$$\text{Odds}(MH=1)_{Ag=1} = e^{(\beta_0 + \beta_1)} \tag{3}$$

$$\text{Odds}(MH=1)_{Ag=0} = e^{\beta_0} \tag{4}$$

$$\text{Odds}(PH=1)_{Ag=1} = e^{(\beta_0 + \beta_1)} \tag{5}$$

$$\text{Odds}(PH=1)_{Ag=0} = e^{\beta_0} \tag{6}$$

$$\text{OR} = \frac{e^{(\beta_0 + \beta_1)}}{e^{\beta_0}} \tag{7}$$

## 3. Results and Discussion

### 3.1. Sample Characteristics

The demographic profiles of the respondents indicate that the majority of the respondents (78%) were over 50 years old, as shown in figure 1. This is the age group that tends to experience ageism in the older adults category. Therefore, the respondents were in a good position to answer the questions of whether they have been subjected to any form of ageism. Furthermore, they are experienced enough to have seen either their colleagues or employers practice any form of ageism. On the other hand, the younger respondents (49 years and below) were also well positioned to give their opinions about the existence and impact of ageism in the construction industry.

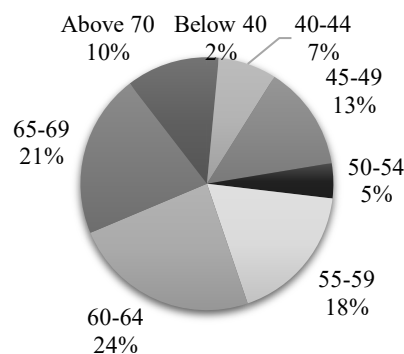


Fig. 1. Age of respondents

In terms of ethnicity, a majority of the respondents were Non-Hispanic white (81%), Asian (6%), Black or African American (5%), Hispanic and Latino (4%), and others (4%). The survey respondents were distributed across the four regions with the Midwest accounting for the majority (36%), Northeast (29%), South (19%), and West (16%). Respondents were asked whether they had ever been treated less favorably than others in a similar situation because of their age or assumptions about age. Out of those surveyed, 43 per cent reported to have been treated less favorably because of their age or assumptions about age. This ageism prevalence rate is slightly lower than the national average in all sectors of those who have either experienced or seen ageism which stands at 60 per cent (Kolmer, 2023) percentage. Additionally, respondents were asked

to give their opinions on whether they thought that they were treated less favorably than others in a similar situation although not directly told. The data show that 58 per cent of those surveyed thought that they were treated less favorably than others in a similar situation although not directly told compared to 42 per cent who did not.

Table 1 shows the work environment of the respondents. Although most respondents (49%) spend 50-89 per cent of their time on the jobsite, ageism occurs both at the jobsite and in the office. Therefore, with the mixed view of the respondents, the data collected gave a true picture in terms of the workings of the construction industry where work is conducted at the jobsite and supported from the office. This gives both the perceived physical demands at the jobsite and the technical, and technology requirements at the office setting.

**Table 1.** Respondent’s work environment

Frequency on the job site	Percentage of respondents
90 - 100 % on the job site	26%
50 - 89 % on the job site	49%
10 - 49 % on the job site	22%
90 - 100 % in the office	3%

**3.2. Model Fitting**

Table 2 shows the logistic regression output results for the fitted model of the impact of ageism on the mental health of construction workforce. The results show that Logistic coefficient is positive and significant ( $p < .001$ ), revealing a statistically significant relationship between mental health and ageism. What this therefore means is that ageism experienced by individuals has an impact on their mental wellbeing.

**Table 2.** Fitted mental health model coefficients, standard errors, and  $p$  values

Model	$B_0$	Std. Error	$p$ value	$\beta_1$	Std. Error	$p$ value
$P(MH=1) = \frac{1}{1+e^{-(\beta_0 + \beta_1 Ag)}}$	-0.123	0.135	0.365	0.155	0.039	< .001*

The logistic regression output in Table 3 reveals that the logistic coefficient for ageism is positive and significant. This indicates a statistically significant ( $p < .001$ ) positive relationship between ageism and the physical health of the construction workforce. This means that the experience of ageism by individuals has a significant impact on their physical well-being.

**Table 3.** Fitted physical health model coefficients, standard errors, and  $p$  values

Model	$B_0$	Std. Error	$p$ value	$\beta_1$	Std. Error	$p$ value
$P(PH=1) = \frac{1}{1+e^{-(\beta_0 + \beta_1 Ag)}}$	-0.105	0.153	0.495	0.153	0.046	< .001*

Table 4 shows the odds of  $MH = 1$  when  $Ag = 0$  and  $Ag = 1$  and  $PH = 1$  when  $Ag = 0$  and  $Ag = 1$ , as well as odds ratios for the mental and physical health models. From the computations, the OR values for the logistic regression are greater than 1. Therefore, OR values as presented in this study mean that when the construction workforce experience ageism, the chance of their mental and physical health being impacted rises by the value of that OR.

What these results mean is that compared to individuals in the construction workforce who do not experience ageism, those that do are 1.168 times more likely to have their mental health impacted. Similarly, compared to individuals in the construction workforce who do not experience ageism, those that do are 1.165 times more likely to have their physical health impacted.

**Table 4.** Fitted model odds ratios

Model	Odds ( $Ag = 0$ )	Odds ( $Ag = 1$ )	Odds Ratio
$P(MH=1) = \frac{1}{1+e^{-(\beta_0 + \beta_1 Ag)}}$	0.884	1.012	1.168
$P(PH=1) = \frac{1}{1+e^{-(\beta_0 + \beta_1 Ag)}}$	0.900	1.049	1.165

These findings are consistent with previous studies that have been conducted on the general population of older adults aged 50 years and above. These studies consistently show that ageism contributes to negative mental health outcomes among older adults. For example, a study conducted among over 60-year-olds in Portugal found moderate to high levels of psychological distress in moderate levels of ageism (Ribeiro-Gonçalves et al., 2023). Lyons et al. (2018), also conducted a nationwide survey on the general population and found a strong relationship between ageism and mental health. The difference between these studies and the current study is that previous studies did not focus on workplace ageism, leave

alone a study in the construction industry. In as much as these findings are consistent with the previous studies, the current study contributes to the body of knowledge through the focus on workplace ageism and specifically the construction industry.

The experience of ageism is associated with increased levels of stress, anxiety, and depression. The persistent exposure to ageist attitudes and behaviors in the workplace erodes self-esteem and contributes to feelings of marginalization and exclusion. These psychological distresses can exacerbate mental health disorders and have long-term implications for workers' well-being. Moreover, chronic stress resulting from ageism weakens the immune system, making workers more susceptible to various health conditions such as cardiovascular diseases (Steptoe and Kivimäki, 2012). These findings reveal that the impact of ageism on the mental health of the construction workforce has far-reaching implications. Depending on how different people respond to the induced psychological distress, some are likely to internalize mental health problems, whereas others are likely to resort to alcohol and drug abuse and thus externalize mental health issues (Vogt Yuan, 2007).

Regarding ageism and physical health, the current literature lacks quantitative studies addressing the subject. However, some studies based on systematic reviews (e.g., Donizzetti and Capone, 2023; Carr, 2023; JD and Alan, 2023) have pointed out the impact of ageism on the physical health of older adults. These findings are consistent with the current study. Ageism can impact the physical health of the construction workforce in several ways. It can lead to increased risk of workplace injuries because of the existing bias that older workers are not physically fit as compared to their younger counterparts. In some cases, workers can be assigned to tasks which are more physically demanding without considering their abilities or limitations. Therefore, older workers will be prone to workplace injuries. Furthermore, ageism can contribute to a lack of work related accommodations and support such as equal access to medical care and insurance, rehabilitation services, and any other necessary support for the full recovery of the injured workers. Ageism can also lead to increased prevalence of chronic diseases due to lack of opportunities to engage in preventative health measures. Specifically, older construction workforce may lack access to training programs aimed at reducing injury risks such rest breaks, and ergonomic modifications which in turn will lead to chronic health conditions.

Addressing ageism in the construction industry is crucial for promoting the well-being of workers. Organizations should strive to create inclusive work environments that value and respect individuals of all ages. Diversity and inclusion training programs can raise awareness about ageism and its impact, while policies and practices should ensure equal opportunities for career development and advancement. Top of Form

#### **4. Conclusion**

The aim of this paper was to investigate the impact of ageism on the mental and physical health of the construction workforce. Ageism, which has been defined as stereotypes, prejudices or discrimination based on age, was found to have an impact on the mental and physical health of individuals working in the construction industry. These findings are consistent with past research conducted on the general population for adults aged 60 years and older.

Ageism has been linked to higher stress, higher anxiety, and higher levels of depression in construction workers. Research has shown that ageism increases the risk of developing more serious mental health problems over time. The constant exposure of ageism in the workplace leads to an erosion of self-confidence and self-esteem. This in turn leads to feelings of exclusion and marginalization. These psychological setbacks can have a long-term impact on one's mental health.

Ageism also has a negative impact on workers' physical health. Studies have shown that age discrimination leads to higher levels of stress and strain for workers. Ageism can also increase the risk of work-related injury and illness among older workers. Older workers may be exposed to more physically challenging tasks or be denied adequate accommodation. It is essential to address ageism in the construction sector in order to protect workers' physical and mental health.

Employers and organizations need to create an inclusive work environment that values and respects workers of all age groups. Diversity and Inclusion training programs should help raise awareness of ageism and work-related issues. Employers should implement policies and practices that promote equal opportunity for career growth and advancement for all employees. To foster a healthier and more supportive work environment for all employees, it is crucial to implement initiatives that combat ageism and promote inclusiveness within the construction sector. Top of Form

This study has some limitations. First of all, in as much as the response rate for the individuals surveyed falls within the acceptable range, a larger sample size would be beneficial to give more conclusive results. Furthermore, this research is limited to respondent opinions on the impact of ageism on older workers, and does not include direct measures of mental and physical health to ascertain the prevalence of mental and physical cases in the sector. This would be beneficial especially on how those individuals whose mental health is affected deal with the psychological distress.

#### **Author Contributions**

James Kereri contributes to research idea development and conceptualization, methodology design, validation, data collection, draft preparation, and supervision. Getrude Nyang'au contributes to methodology, data analysis, draft preparation, and manuscript editing. All authors have read and agreed with the manuscript before its submission and publication.

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James Ogechi Kereri holds a Ph.D. in Engineering Science with a concentration in Construction Management. Dr. Kereri is an assistant teaching professor at the University of Missouri. James has previously worked as a construction manager with a five-year record of success overseeing all phases of multimillion-dollar construction of residential and commercial projects, as well as infrastructure and environmental projects for government and private-sector clients. Dr. Kereri's research interests are in relationship management, relational contracting, construction project team behaviors, relationship quality, and labor issues including safety and other emerging workforce related topics. Dr. Kereri also holds the Associate Safety Professional (ASP) certification issued by the Board of Certified Safety Professionals (BCSP).



Getrude Kemunto Nyang'au is a doctoral student in Human Development and Family Science at the University of Missouri. As a graduate instructor, she actively contributes to the department's academic environment. Her research revolves around ageism and its profound influence on the mental health of older adults. Additionally, Ms. Getrude investigates the role of ageism in shaping sexual behaviors and romantic relationships among older individuals, aiming to promote understanding of the complexities of aging and interpersonal dynamics in later stages of life and improve the well-being of this population.