Research Article

Workplace Loneliness Among Public-Sector Doctors in Assam: Examining Age and Gender Differences

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Abstract

This study conducted among 528 physicians from public healthcare of 10 districts in Assam, India, evaluates the differences in workplace loneliness according to age and gender. Workplace loneliness was measured using an adaptation of the three-item scale developed by Hughes et al. (2004). The internal consistency of the short three-item scale was acceptable (Cronbach's $\alpha = .707$; standardized $\alpha = .712$), which supports the reliability of the measure for further analysis. Since the assumption of equal variances was not met, gender differences were tested with an independent-samples t-test including Welch's correction. For the age-group differences, since the homogeneity-of-variance assumption was violated, Welch's ANOVA was carried out, followed by Games–Howell post-hoc comparisons. Spearman's rank-order correlation was applied in order to examine the association between age and workplace loneliness. There were significant differences in workplace loneliness among the various age groups, the result indicated Welch's $F(3, 220.75) = 88.38$, $p < .001$. The average level of workplace loneliness was lower among older physicians, ranging from 4.47 (aged 22-30 years) to 3.11 (aged 51 to 60 years), and the Games–Howell comparisons showed that all of the six comparisons between age groups were statistically significant. Men also reported significantly greater workplace loneliness than women, with $t(253.01) = -4.44$, $p < .001$, and Hedges' $g = -.469$, which shows a moderate standardized difference. Age was negatively correlated with workplace loneliness (Spearman's $\rho = -.517$, $p < .001$).

Keywords: physicians, workplace loneliness, age, gender, health

1. Introduction

Loneliness has degrading effects on health and relationships. It is the gap between the relationships we want and the ones we actually have. It is not influenced solely by the frequency of social relationships; it is more about meaningfulness and quality (Cacioppo et al., 2006a; Cacioppo et al., 2006b; Hawkley & Cacioppo, 2010). Long-term research shows that the intensity of loneliness is not limited to one stage but varies throughout different phases of life (Mund et al., 2020; Qualter et al., 2015). It causes personal distress, damaging mental well-being and physical health (Cacioppo et al., 2015; Holt-Lunstad et al., 2015).

A systematic review and meta-analysis covering 113 countries stated that loneliness is a public global health emergency (Surkalim et al., 2022). Building on this foundation, broader investigations into loneliness within specific social contexts, such as the workplace, are now possible. The workplace is a critical environment because it requires individuals to engage in ongoing interactions with colleagues, supervisors, teams, and the organizational structure as part of daily routines. Consequently, deficiencies in workplace relationships may result in individuals experiencing loneliness, despite frequent opportunities for social interaction. Recent research on organizational relationships has recognized that the quality of interpersonal connections at work significantly influences employees' attitudes, well-being, and overall organizational functioning (Chiaburu & Harrison, 2008; Grant & Parker, 2009). Workplace loneliness is defined as the subjective perception of lacking sufficient meaningful interpersonal relationships within the work environment. Wright et al. (2006) were among the first researchers to regard workplace loneliness as a separate organizational construct and created a measure specific to the workplace which included both emotional deprivation and social companionship. They proposed that loneliness felt at work should not be seen merely as general loneliness that occurs in an organizational context. Since then, organizational scholars have emphasized the distinctiveness of loneliness in the workplace. Wright and Silard (2021) presented a process-based model that suggests that workplace loneliness may occur when a person's characteristics interact with their interpersonal relationships, the workplace environment, and their perceptions of their relationships. Objective social isolation is the extent and frequency of social contact and subjective social isolation is the individual's judgment about the satisfaction of their social relationships. In the same way, ostracism at work is the feeling

of being cut off or ignored by others while loneliness can occur even without intentional ostracism. Therefore, it should have implications for organizational research because loneliness can persist in what is perceived as a "highly social" workplace (Wright & Silard, 2021). The field of workplace loneliness is also in its relative infancy, with research on the phenomenon of loneliness in the workplace revealing that it is a relatively new area of study. Research published between 2006 and 2019 indicated that there has been a significant expansion of the field of workplace loneliness, as well as gaps that needed to be addressed with regards to conceptualisation, measurement and methodology (Anand & Mishra, 2019). More recently, Bryan et al. (2024), in a mixed-method systematic review and meta-analysis of 49 studies involving over 14,000 workers in 23 countries, stated that workplace loneliness is linked to occupational functioning and well-being, while at the same time stressing the limitations of the current cross-sectional evidence base. The latest evidence still shows that loneliness in the workplace is not limited to traditional office settings. Studies into remote work have found that loneliness is a significant issue due to reduced interpersonal contact, even though autonomy and social support can influence these experiences (Wang et al., 2021; Wax et al., 2022). Becker et al. (2022) have also shown that loneliness became especially pertinent to employees' well-being and work behavior when they were forced to make the switch to working from home. Longitudinal studies show that the relationship between working from home and loneliness may vary according to the intensity of the work and the amount of social support (Fostervold et al., 2024). The need to examine workplace loneliness is increased by the fact that it is associated with a range of occupational and organizational outcomes. Lam and Lau (2012), after analyzing data from schoolteachers, found that workplace loneliness was linked to poorer leader–member and organization–member interactions as well as to lower in-role and extra-role performance. Similarly, Ozcelik and Barsade (2018), in a large field study, discovered that greater levels of workplace loneliness were associated with worse job performance, primarily due to reduced affective commitment and approachability. It also affects employees' relationship with the organization (Firoz & Chaudhary, 2022).

Employee attitudes have also been connected with feelings of loneliness in the workplace. Ayazlar and Güzel (2014) found a negative relationship between loneliness in the workplace and organizational commitment among employees working in hotels, and in a comparable way, Yilmaz (2008), in a study concerning employee loneliness, found that loneliness was associated with a weaker sense of organizational attachment and a greater intention to leave. These findings indicate that workplace loneliness may affect not only the employees' personal experiences but also their relationship with the organization. Moreover, research carried out in Indian organizations has looked into both workplace loneliness and employee well-being. According to Mohapatra et al. (2023), who looked at 264 middle-level managers in the Delhi–NCR area, workplace loneliness was found to be positively linked with work alienation and negatively linked with psychological well-being, perceived organizational support, and self-esteem. There is also evidence showing a connection between workplace loneliness and both work engagement and job satisfaction. Jung et al. (2021) discovered that workplace loneliness was negatively linked to work engagement and organizational commitment, positive relationships with colleagues and leaders serving as a significant contextual factor. Similarly, Basit and Nauman (2023) found that workplace loneliness led to lower levels of work engagement, and this engagement was then linked to higher job dissatisfaction. It is especially noteworthy that these effects persist. Lowman et al. (2024), who used longitudinal data from Dutch employees, discovered that loneliness continued to have a negative association with job satisfaction over time, even when taking into account established job-related predictors. The fact that they found this indicates that loneliness may influence employees' work experiences rather than simply reflecting a short-lived emotion in the workplace. Bryan et al. (2024) summarize the wider evidence, showing that workplace loneliness is linked to poorer job performance, reduced job satisfaction, weaker worker–manager relationships, and higher levels of burnout.

The authors, however, stressed that since most of the existing studies were cross-sectional, any conclusions about causality were limited. More recent research carried out in Spain has likewise found associations between workplace loneliness, absenteeism, and adverse mental-health outcomes (Domènech-Abella et al., 2025). The evidence from the literature indicates that workplace loneliness is not simply an individual emotional experience; it may have effects on employee well-being, work attitudes, interpersonal relationships, performance, engagement, absenteeism, and organizational functioning. Yet, these outcomes should not be seen as universally causal since a great deal of the literature on workplace loneliness is cross-sectional.

2.Review of literature

2.1Age and Workplace Loneliness

Age is a significant demographic feature that allows workplace loneliness to be studied since employees at various stages of their lives usually have different career positions, amounts of experience within the organization, workplace networks, social resources, and occupational identities. Research shows that loneliness exhibits different patterns at different stages of life rather than staying the same throughout adulthood (Qualter et al., 2015). Mund et al. (2020), in a meta-analysis of 75 longitudinal studies with more than 83,000 participants, found that loneliness exhibits systematic changes during the course of the life span. Evidence from research involving adult populations as a whole also questions the view that loneliness is primarily a problem experienced by older people. In a study of adults across a wide age range in the United Kingdom, Victor and Yang (2012) found that loneliness varies from age group to age group and so cannot be regarded simply as an issue of later life. Furthermore, Hawkley and Cacioppo (2007) stated that even if loneliness stays fairly steady throughout most of adulthood, the factors associated with loneliness do change as people age. These results provide a theoretical basis for considering age in the context of the workplace. Younger employees may have few well-established relationships at work, know relatively little about the organization, and have less developed professional networks; they might also be going through changes in their professional identity and in their occupational status. By contrast, older employees might have greater knowledge of the organization and a larger number of established professional relationships, even though this does not mean that they are free from feeling lonely. Nevertheless, evidence that is specific to the workplace is still inconsistent. In a study involving 934 employees in Indian manufacturing and service organizations, Firoz et al. (2022) found that there were significant differences in workplace loneliness depending on age, whereas gender and length of time in an organization did not have a significant influence on loneliness. On the other hand, Brady et al. (2022), in their comprehensive meta-analytic review, found no significant overall association between age and workplace loneliness. This suggests that age may not be a universal determining factor and that the occupational context may influence the presence of age differences. There are newer data available to support the notion of considering age rather than assuming a relationship. Hajek and König (2026) conducted a systematic review and meta-analysis and identified that the prevalence of workplace loneliness decreased with age, with younger workers reporting a higher prevalence of workplace loneliness than older age groups. The authors also pointed out that the number of eligible studies was small and stressed the importance of having research carried out in underrepresented geographical areas. There are, therefore, a number of empirical discrepancies among the evidence: some indicate differences related to age, others do not. This is particularly important in the Indian healthcare context because the professional hierarchy, workload, career stage, organizational structure and interpersonal networks may vary significantly across the various groups of occupations that were examined in previous studies. Hence, this study looks at whether there is a significant difference in workplace loneliness among four age groups rather than supposing that there is a linear relationship between age and loneliness.

2.2Gender and Workplace Loneliness:

Gender is also a demographic variable of interest because social interactions, position in the hierarchy, professional networks, social inclusion, and access to support may differ across genders. Nevertheless, there is no theoretical basis for the assumption that the experience of loneliness is universally higher among women or men in the workplace. Studies on the phenomenon of loneliness rarely revealed significant differences between the two genders. Such differences were found to be dependent on age, relationships, cultural norms, and other factors related to the methodology. Therefore, it is necessary to study the phenomenon of loneliness based on actual data rather than relying on potentially biased assumptions about gender-specific social experiences. Workplace literature provides inconsistent evidence on the topic. Brady et al. (2022) found no significant overall gender difference with regard to workplace loneliness, just as the more recent evidence is generally in agreement with this conclusion. Meanwhile, wider studies of the workplace show that demographic and occupational characteristics can interact with working conditions. For example, a study on the causes of loneliness in the workplace and in non-workplace settings in Spain found that demographic and occupational risk factors are not necessarily associated with similar effect sizes in the two types of loneliness (Domènech-Abella et al., 2025). This outcome suggests that a researcher investigating workplace loneliness cannot simply apply findings obtained in general populations to the workplace, as these outcomes may not be generalized. The study now seeks to investigate whether there is a significant difference in workplace loneliness between male and female respondents within the group of selected physicians working in public healthcare organizations in Assam.

3.Research Gap

The level of research on loneliness in the workplace is still relatively recent. As revealed in the Firoz et al. (2021) review,

workplace loneliness did not emerge as a significant systematic area of study until the mid-2000s; and as noted in several subsequent reviews, conceptual and methodological issues remain. The most comprehensive systematic review carried out so far found only 49 eligible studies from 23 countries, showing that the empirical evidence base is still considerably smaller than that available for general loneliness. The demographic findings are inconsistent. In some studies age has been found to be significant whereas in others it has not been; gender, on the other hand, has generally exhibited weak or inconsistent relationships with workplace loneliness. At this time, the bulk of evidence is from research on the general workforce, and there are fewer studies focusing on health care workers. This is important because healthcare professionals have specific inter- and intra-personal and occupational relationships and requirements, including a heavy workload, hierarchical relationships, emotional requirements, teamwork, shift schedules, and close contact with patients, coworkers, etc. For instance, O'Hare et al. (2024) looked at loneliness, workplace isolation, well-being, and social support among healthcare workers, while Çağatay (2026) specifically examined workplace loneliness and the communication climate among healthcare workers. Fourth, there is scarce evidence regarding doctors working in public healthcare institutions in India's northeastern area. Current research among the Indian population has mainly looked at employees in general organizational settings or at specific samples from the managerial and business sectors. Anand and Mishra (2019) studied the employees in manufacturing and service organizations, whereas Mohapatra et al. (2023) concentrated on middle-level managers in the Delhi–NCR region. This study offers three main contributions. The first of these is to apply research on workplace loneliness to physicians in public healthcare institutions, an occupational group which has until now been relatively underrepresented in demographic studies of workplace loneliness. The second contribution is to look at whether workplace loneliness varies in a systematic way among different age groups and between the male and female physicians, rather than treating demographic characteristics just as control variables. The third contribution is to combine group-comparison analyses with a rank-based association analysis in order to assess whether the observed age pattern shows both differences between the age groups and an ordered association between age and loneliness. Taken together, these methods allow for a more thorough evaluation of the demographic diversity in workplace loneliness. The study addresses the following research objectives:

Objective 1: To find out if there is a significant difference in workplace loneliness between male and female respondents.
Objective 2: To look at whether there are significant differences in workplace loneliness among different age groups.
Objective 3: To examine the association between age and feelings of loneliness at work.

4.Formulation of Hypotheses

H1: There is a significant gender gap in workplace loneliness among the selected physicians.
H2: There is a significant age gap in the workplace among the selected physicians.
H3: Age is significantly associated to loneliness at work among the selected physicians.

5.Population and Sampling

This was done by means of non-probability sampling methods which included purposive sampling of districts and snowball sampling of eligible physicians. The subjects of the study were registered and working physicians in government health care institutions in the state of Assam, in India. To ensure that participants come from different Public Healthcare Institutions distributed across the regions of Assam. The state has five such regions, namely Barak Valley, Central Assam, Lower Assam, North Assam and Upper Assam. From each of these regions two districts were deliberately chosen, which led to the selection of 10 district-level sampling areas: Karimganj and Cachar (in Barak Valley); Nagaon and Morigaon (in Central Assam); Kamrup Rural and Barpeta–Bajali (in Lower Assam); Darrang and Udalguri (in North Assam); and Golaghat and Dibrugarh (in Upper Assam). Recruitment of participants then consisted of making direct field contract and using snowball sampling. The researcher went personally to the chosen districts and first contacted the physicians who were working in the public health care institutions. The eligible participants were then recruited via referrals from the participating physicians, as it was practically impossible to obtain a full list of the eligible doctors. Data collection went on until a sufficient number of eligible responses had been secured for the intended statistical analyses. Workplace Loneliness measurement scale was adapted from the three-item scale developed by Hughes et al. (2004) to assess workplace loneliness. The scale has been widely used in both organizational and health research for evaluating subjective feelings of social disconnection and isolation (for example, "How often do you feel that you lack enough colleagues?", "How often do you feel left out at work?", and "How often do you feel isolated from other people at work?"). The responses were given on a five-point scale (1 = never, 5 = always) with higher scores indicating greater workplace loneliness. The three workplace-loneliness items were averaged to create a composite score ranging from 1 to 5, with higher scores indicating greater workplace loneliness.

6.Participants' inclusion and exclusion criteria

The participants were medical practitioners working in public health care institutions of with a minimum of one year of practice. Interns and physicians who failed to meet the criterion were not included. Data screening excluded 30 responses from the 558 received: 17 did not meet the inclusion criteria for the study and 13 responses were incomplete for analysis. So, the final analytical sample was 528 physicians. The final data set was checked for missing values and the statistical implications of the assumed data for planned analyses. For all statistical analyses the final sample comprised of 528 respondents.

7.Statistical analysis

Table 1 Descriptive statistics and internal consistency of the workplace loneliness

Items	M	SD
How often do you feel you lack enough colleagues in your health center?	4.36	1.002
Do you feel isolated/disconnected from others?	3.79	1.048
How often do you feel left out?	3.61	1.202

Table 2 Reliability statistics for the workplace loneliness scale

Number of items	**3**
Cronbach's α	.707
Standardized Cronbach's α	.712
Scale mean	11.76
Scale variance	6.712
Scale SD	2.591
N	528

(Note: The three-item Workplace Loneliness Scale demonstrated acceptable internal consistency, with Cronbach's α = .707 and standardized Cronbach's α = .712.)

The three workplace loneliness items showed acceptable internal consistency in the current sample. Cronbach's alpha was .707 and the standardized Cronbach's alpha was .712, meaning that the internal consistency is also comparable. The mean scores on the items ranged from 3.61 to 4.36. A perceived lack of enough colleagues in the health center (M = 4.36, SD = 1.002) and feeling separated, alone or disconnected from others (M = 3.79, SD = 1.048) and feeling left out (M = 3.61, SD = 1.202) had the highest mean responses. These descriptive findings suggest moderately high levels of feelings of loneliness in the workplace on each of the three indicators. The scale-level mean was 11.76 (SD = 2.591). All three measures were administered on the same response scale (five-point scale) and three items averaged about 3.92, implying that the response ratings were, on average, higher than the midpoint of the scale. Descriptive statistics were calculated for workplace loneliness across gender and age groups. For the gender comparison an independent-samples t-test was initially taken into account. Levene's test was significant ($F = 47.549$, $p < .001$), indicating that the assumption of equal variances was violated. Therefore, the Welch-adjusted independent-samples t-test was used. Because Levene's test indicated a violation of the homogeneity-of-variance assumption and the groups were unequal in size, a Welch's ANOVA was used to test the overall group difference, followed by Games–Howell post hoc comparisons. Effect sizes were reported for the gender comparison (Hedges' g). For the age-group comparison, effect-size interpretation was based on the magnitude of the group mean differences, given that the eta-squared statistic derived from the standard ANOVA model assumes equal variances. Monotonic relationships between workplace loneliness and age were explored via Spearman's rho.

8.Results

Table 3 Workplace loneliness across age groups

Age group	N	Mean	SD
22–30	144	4.4745	.2107
31–40	157	4.0212	.7760
41–50	130	3.7589	.8154
51–60	97	3.1068	1.1049
Total	528	3.9123	.8891

(Note: Mean scores measured on a five-point scale, with higher scores indicating greater workplace loneliness)

Loneliness at work was seen to significantly differ by age group. Physicians aged 22–30 years reported the highest level of workplace loneliness (M = 4.4745, SD = 0.2107), followed by those aged 31–40 years (M = 4.0212, SD = 0.7760), 41–50 years (M = 3.7589, SD = 0.8154), and 51–60 years (M = 3.1068, SD = 1.1049).

Table 4 One-way ANOVA for workplace loneliness by age (reported for comparison with Welch's test)

Source	SS	df	MS	F	P
Between groups	113.374	3	37.791	65.301	<.001
Within groups	303.252	524	.579	—	—
Total	416.626	527	—	—	—

(Note: P < .001 indicates a statistically significant difference among the groups. SS = Sum of Squares; df = degrees of freedom; MS = Mean Square; F = F-statistic; p = p-value)

Table 5 Welch's test of equality of means for workplace loneliness by age

Test	Statistic	df1	df2	Sig.
Welch	88.378	3	220.750	<.001

(Note: Levene's test indicated that the homogeneity-of-variance assumption was violated; therefore, Welch's F is reported in place of the standard fixed-effects F-test)

Because Levene's test indicated that the homogeneity-of-variance assumption was violated, a Welch's ANOVA was used to test the overall age-group difference. The Welch's test demonstrated a statistically significant difference in workplace loneliness across age groups, Welch's F(3, 220.75) = 88.378, p < .001. The magnitude of the mean difference between the youngest and oldest age groups (4.47 vs. 3.11) further indicates that this was a substantial effect. This supports H2 (workplace loneliness significantly differs across age groups).

Table 6 Games–Howell pairwise comparisons of workplace loneliness across age groups

Age comparison	Mean difference	SE	P
22–30 vs. 31–40	.4533	.0644	<.001
22–30 vs. 41–50	.7157	.0736	<.001
22–30 vs. 51–60	1.3677	.1136	<.001
31–40 vs. 41–50	.2624	.0946	.030
31–40 vs. 51–60	.9144	.1282	<.001
41–50 vs. 51–60	.6520	.1330	<.001

(Note: Every age-group comparison was statistically significant. The ordering of the means was: 22–30 > 31–40 > 41–50 > 51–60)

Thus, the age effect was not attributable to a difference between only one or two age categories; instead, the data showed a consistent gradient across all four groups.

Table 7 Workplace loneliness by gender

Gender	N	Mean	SD	SE
Female	179	3.6426	1.1189	.0836
Male	349	4.0506	.7073	.0379

(Note: Higher mean scores indicate greater workplace loneliness; scores were measured on a five-point scale. Male respondents reported higher workplace loneliness than female respondents)

Table 8 Welch independent-samples t-test

Test	T	Df	P	Mean difference	95% CI
Welch's t	−4.444	253.008	<.001	−.4080	[−.5888, −.2272]

(Note: Welch's t-test was used due to unequal variances. Mean difference = female – male)
Levene's test was significant, F = 47.549, p < .001, indicating that the assumption of homogeneity of variances was violated. Therefore, the Welch-adjusted independent-samples t-test was used. The Welch-adjusted test indicated a statistically significant gender difference in workplace loneliness, t(253.01) = −4.444, p < .001. Because the comparison was calculated as female minus male, the negative mean difference and negative Hedges' g indicate higher workplace-loneliness scores among male respondents. Male respondents reported higher workplace loneliness (M = 4.05) than female respondents (M = 3.64).The magnitude of the standardized difference was moderate (Hedges' g = −0.469, 95% CI [−0.651, −0.287]). Therefore, H1 was supported.

Table 9 Spearman correlation between age and workplace loneliness

Variables	Spearman's ρ	P	N
Age – workplace loneliness	−.517	<.001	528

Spearman's ρ indicates the strength and direction of the monotonic association between age and workplace loneliness. A statistically significant negative association was observed between age and workplace loneliness, Spearman's ρ = −.517, p < .001, N = 528. The negative coefficient indicates that higher age was associated with lower workplace-loneliness scores.

Importantly, the direction and substantive conclusion were consistent across the parametric group-comparison and rank-based correlation analyses. Similarly, the Welch's ANOVA and Games–Howell post-hoc comparisons demonstrated significant differences across all four age groups, workplace loneliness being consistently lower in older age groups compared to younger ones. Thus, despite the different statistical assumptions underlying the procedures, the analyses converged on the same substantive conclusion: workplace loneliness was systematically lower among older physicians in this sample. This supports H3 (Age is associated with workplace loneliness).

9.Discussion

This study examined workplace loneliness in relation to age and gender among 528 physicians. Three principal findings emerged. First, workplace loneliness differed significantly across the four age groups, with the highest level among respondents aged 22–30 years and the lowest among those aged 51–60 years. Second, men reported significantly greater workplace loneliness than women, with a moderate standardized effect. Third, age demonstrated a significant negative association with workplace loneliness (Spearman's ρ = −.517, p < .001). Taken together, the descriptive result, group comparison result and correlational result converge into strong evidence that there is a systematic pattern of the level of loneliness in the workplace by age in the present sample. This is important as the growing body of research

indicates that loneliness in the workplace is not evenly experienced by all workers. The strength and nature of the demographic effects, however, differ among countries, occupations, and methods of measurement. The present findings should be interpreted in the light of both supporting and contradicting evidence. The mean difference between the youngest and the oldest age groups was 1.37 points. Loneliness in the workplace was found to be lower for older individuals (4.47 to 3.11 for ages 22-30 and 51-60 years, respectively). The Games – Howell analysis demonstrated that all age-group comparisons were significant. Because the homogeneity-of-variance assumption was violated across the age groups, a Welch's ANOVA was used to test the overall age-group difference, followed by Games–Howell post-hoc comparisons.

The Spearman analysis provided additional evidence of a systematic relationship, with age category negatively associated with workplace loneliness (ρ = −.517). This finding is strongly consistent with the newest systematic evidence. However, the present monotonic age gradient differs somewhat from evidence from Japan. Kawakami et al. (2025), using a large sample of 24,021 employees, also identified significant age differences in workplace loneliness, but their pattern was more complex than the consistent downward trend observed here. This finding indicates that there is a possibility that the age–loneliness association is affected by work setting and country. The differences are theoretically significant. Age may not be a direct indicator for the sense of loneliness at work. Age may instead signify differences relating to organizational embeddedness, professional networks, work experience, and social capital. Youths may not have built up rapport as they have at earlier ages and may not have gotten to know their coworkers and bosses as they have in the past or have the ability to have peers who work for them. Greater time may have been available for working longer to establish stable networks and professional identity for an older employee. This is in line with the overall conceptualization of workplace loneliness, which refers to a perceived lack of meaningful relationships at work instead of the absence of social interaction. In a systematic review, Bryan et al. (2024) identified 49 studies that revealed a link between workplace loneliness and poor workplace social interaction and various aspects of occupational well-being. However, the present study is cross-sectional and cannot determine if there is an age-related shift regarding a worker's sense of loneliness. Age effects could be partially due to cohort differences, to career choice, or survivor effects.

The question of whether workplace loneliness is gradually declining among older workers over time would thus be better tested with longitudinal studies that track changes over time in employees across the career life cycle. Female physicians reported lower workplace loneliness (M = 3.6426, SD = 1.1189) than male physicians (M = 4.0506, SD = 0.7073). Because Levene's test was significant, $F = 47.549$, $p < .001$, the assumption of equal variances was violated; therefore, the Welch-adjusted independent-samples t-test was used. The difference was statistically significant, $t(253.01) = -4.44$, $p < .001$, with a mean difference of −0.4080 (95% CI [−0.5888, −0.2272]). The magnitude of the standardized difference was moderate (Hedges' $g = -0.469$, 95% CI [−0.651, −0.287]), with the negative sign reflecting the female-minus-male comparison. Thus, male physicians reported significantly higher workplace loneliness than female physicians.

This finding is consistent with the large Japanese study included in the recent systematic literature, in which women had lower odds of workplace loneliness than men. However, this evidence is not universal. Hajek and König (2026) found that pooled workplace-loneliness prevalence was roughly comparable between men and women, while noting that the Japanese study produced a significant gender difference. This contrast is important. It indicates that the present result should not be interpreted as evidence that men are inherently more susceptible to workplace loneliness. Instead, gender may interact with organizational structures, social norms and occupational environments. The divergence from Indian evidence is particularly noteworthy. Firoz et al.'s (2022) study of 934 Indian employees found no significant effect of gender on workplace loneliness, despite finding a significant age effect. Thus the current study presents a different picture of gender-related vulnerability in an Indian professional population. Another explanation is the change in the occupational composition. The Indian study sample consisted of manufacturing and service employees while the present sample is representative of a professional population. The medical profession may have its own unique patterns of hierarchy, responsibility, autonomy and interpersonal interaction. Thus, the social meaning of gender may vary across occupational settings in the workplace. A second possibility is the nature of relationships at work. It's possible to be surrounded by coworkers and still feel a lack of meaningful connection. Thus gender differences may be explained by differences in emotional disclosure, help-seeking, friendship formation and access to informal support. These mechanisms were not directly tested in the current study and should therefore be investigated rather than assumed.

10.Limitations

The use of the cross-sectional approach makes it difficult to prove a cause-and effect relationship among age, gender, and loneliness at work.
The application of purposive and snowball sampling in certain districts may make it hard to generalize the results to all public -doctors in Assam.

Moreover, research was limited only to age and gender without taking into consideration other possible factors of workplace loneliness.

11.Suggestions

Results indicate that rather than 'one-size-fits-all' employee health initiatives, targeted employee connection initiatives should be encouraged in the workplace. To young doctors, formal mentoring programs, peer support, onboarding communities and informal networking can pave the way for relationship building within the healthcare sector. Making connections and providing support to young doctors is important. Fortifying social capital in organizations may be particularly advantageous. In the workplace, as is shown in the recent study of physicians, a trust-based environment, reciprocity measures and professional networks are known to be essential. The most important thing is the quality of interaction, particularly within the public healthcare institutions. It is important to note that simply adding to the number of meetings, group activities or communication does not decrease feelings of loneliness if it does not happen to be meaningful or supportive to the employee.

12.Ethical Consideration

The current study was carried out in an ethical manner aligned with the ethical principles pertaining to research involving human subjects. As all participation was voluntary, and participants were told what the study was, how/what they would be involved in and their right to refuse participation or quit the study at any time. Responses from participants were kept confidential and the data were only used for academic research.

13.Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The authors used ChatGPT as an aid to linguistic accuracy, quality of the grammar and clarity of the text. AI was not used for any other purposes apart from language related assistance. The final copy of the manuscript was reviewed, revised and approved by author whose responsibility it is to ensure the accuracy, originality and honesty in work submitted for publication.

14.Conflict of interest

The authors declare no conflict of interest

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