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ASSESSMENT OF KNOWLEDGE, PRACTICES AND PERCEIVED CHALLENGES REGARDING HAND HYGIENE REPORTED BY NURSES AT DIR DHQ HOSPITAL DIR UPPER

Ijaz Ul Haq[1], Muhammad Anwar[*2], Shehzad Wasim[3], Zohaib Ali[4], Suhail Ahmad[5], Luqman Ahmad[6], Kamran Ullah[7], Kaleem Ullah[8], Sumaira Bibi[9]

[1,3,4,5,6,7,8]Gradulate Nurse BSN Medtec College of Nursing & AHS Dir Upper Wari KPK Pakistan
*[*2]MSN, BSN, RN Assistant Professor/Principal Medtec College of Nursing & AHS Dir Upper Wari KPK Pakistan*
[9]PRN, RN Nursing Lecturer Medtec College of Nursing & AHS Dir Upper Wari KPK Pakistan

[*2]m.anwar.ma528@gmail.com

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Corresponding Author: *
Muhammad Anwar

Abstract

Background: *Hand hygiene is a critical measure to prevent healthcare-associated infections and ensure patient safety. Despite global guidelines, compliance among nurses remains suboptimal, often due to knowledge gaps, workload, and institutional barriers. Understanding nurses' knowledge, practices, and perceived challenges is essential to design effective interventions.*

Aim: *The study aimed to assess knowledge, self-reported hand hygiene practices, and perceived barriers among nurses working at DHQ Hospital Dir Upper, Pakistan.*

Methods: *A descriptive cross-sectional design was employed. The total population of 60 nurses was included using a universal sampling technique. Data were collected through a structured, self-administered questionnaire based on WHO hand hygiene guidelines. The questionnaire covered demographics, knowledge assessment, self-reported practices, and perceived challenges. Data were entered and analyzed using SPSS version 27. Descriptive statistics summarized frequencies, percentages, and means, while Chi-square tests explored associations between demographic/professional variables and knowledge or practices. Statistical significance was set at $p < 0.05$.*

Results: *Most nurses were aged 20–39 years (83.4%) and female (60%). Two-thirds (66.7%) had received formal hand hygiene training in the past two years. Knowledge of WHO hand hygiene guidelines was moderate, with gaps in correct hand rubbing duration and frequently missed hand areas. Self-reported compliance was highest after exposure to body fluids (75%) and lower in routine care, such as after touching patient surroundings (41.7%). Barriers included heavy workload (66.7%), limited availability of hand hygiene supplies (58.3%), and insufficient institutional support.*

Conclusion: *While nurses demonstrated moderate knowledge, adherence to hand hygiene practices was inconsistent, influenced by workload and resource-related barriers. Continuous training, improved resource availability, and supportive institutional policies are recommended to enhance compliance and reduce healthcare-associated infections.*

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INTRODUCTION

The simplest and the most effective solution towards preventing healthcare-associated infections (HAIs) and patient protection is hand hygiene (HH). It entails the use of soap and water or alcohol-based hand rubs (ABHRs) to wash off transient microorganisms [1]. Even though it has been proven to be important, the adherence to recommended hand hygiene practices by healthcare professionals, especially nurses, is not optimal in all parts of the world, and thus it is a major contributor to morbidity, mortality, and high healthcare expenditures [2,3].

HAIs can be considered as a significant source of morbidity, mortality, and financial strain globally. Healthcare-associated infections have an incidence of between 7 and 10 percent in developed countries and more than 20 percent in low- and middle-income nations. Poor hand hygiene behaviors among health care personnel contribute to a significant percentage of such infections. Research that regularly reports compliance with hand hygiene among nurses has consistently not met recommended standards being mostly in the range of 30 to 50. The risk of infection transmission is also increased by high patient turnover and overcrowding. The widespread occurrence of preventable infections shows the greatest need to enhance hand hygiene compliance in hospitals [3,4].

Hand hygiene is understood to be the most practical and cost-efficient intervention that can be used to stop the transmission of infectious diseases in a healthcare setting. Effective handwashing will minimize the spread of the pathogenic organisms that cause bloodstream infections, pneumonia, surgical site infections and urinary tract infections. [5]. It has also been indicated that by increasing hand hygiene compliance, healthcare-associated infections can be reduced by up to 50 percent. Hand hygiene is irregularly adhered to within healthcare facilities even though it is a simple practice. Poor compliance is caused by factors like pressure on work and absence of monitoring. It is a healthcare priority all over the world to strengthen hand hygiene behavior [6].

The nurses are in close and continuous contact with the patients, medical equipment, and hospital settings. The resulting constant exposure exposes nurses to more risk of contracting and spreading infectious agents. Their hand hygiene habits have a direct impact on the dynamics of infections in a healthcare environment [7]. Poor compliance in nurses has been linked with high instances of cross-contamination. Patient safety thus requires the best possible hand hygiene behaviors by the nurses. Nurses play critical roles in the infection control programs. Knowledge base and practice of nurses is a key factor that needs to be assessed to plan effective interventions [8].

Hand hygiene knowledge entails the knowledge of the appropriate methods, time required, and when hand clean is important. The awareness on hand hygiene Five Moments of the World Health Organization is a major aspect of infection prevention education. It has been shown that knowledge gaps are also a major contributor to inadequate hand hygiene. [9]. The wrong beliefs that surround the use of gloves tend to give nurses the idea that they do not have to practice hand hygiene. Constant learning and training are necessary to strengthen the proper knowledge. Determining the level of knowledge can be used to determine gaps in education among nursing personnel [10].

Behavioral, environmental and organizational factors affect hand hygiene practices. It has been observed through observational studies that there is a reduction in compliance in times of emergencies and high workload. Nurses can choose to attend patients in the moment instead of taking care of infection prevention. The lack of access to hand hygiene facilities also undermines the practice compliance. Failure to consistently monitor healthcare workers minimizes levels of accountability. The development of realistic improvement strategies requires the knowledge of real life practice habits [11].

The perceived challenges are important factors that influence the behavior of hand hygiene by nurses. The most frequent obstacles are the lack

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of soap, hand-rubs containing alcohol, and handwashing stations. Irritation of skin due to frequent hand cleansing discourages compliance. Adherence is also low in case of time pressure in busy shifts. The support of the managers is also lacking, which undermines infection control. Perceived challenges should be addressed to facilitate the change of behavior in a sustainable manner [12].

Infection control is a complicated issue in healthcare facilities of low and middle-income countries. Low resources, congested wards, and understaffing make it difficult to implement proper hand hygiene. [13]. The nurses are prone to work under pressure and little institutional support. Poor chain of supply disrupts the unremitting supply of hygiene materials. Such limitations augment the probability of healthcare-associated infections. Local challenges demand context-specific measures that would tackle the challenges [14].

Healthcare-associated infections are still a chronic issue in the context of the public hospitals in Pakistan. Poor outcomes are caused by resource constraints, excessive workload of nurses, and insufficient infection control policies. The compliance of hand hygiene among nurses is very diverse and poorly documented in the district-level hospitals. Available literature is primarily concerned with tertiary care institutions. There is a paucity of evidence in the peripheral healthcare settings. This gap presents the necessity of local research studies in district hospitals [15].

District Headquarter hospitals are hospitals that offer secondary level of care to great masses. The workforce of nurses in these hospitals is characterized by a large number of patients, although they are not well-staffed. The pressure at work denies chances of observing hand hygiene. Such environments have poor infrastructure on infection prevention. Nurses might be unable to access ongoing training programs. These aspects predispose to the spread of infection in hospitals [16].

The culture in an organization has a strong effect on the adherence to hand hygiene practices by nurses. Infection control practices are not adhered to due to the lack of supervision and feedback regularly. Lack of stringent enforcement measures undermines the compliance motivation. The leadership should be supportive to facilitate safe practices. Hospitals of high safety culture record improved hand hygiene results. The assessment of the institutional factors aids in the recognition of gaps at a system level [17].

The psychological and behavioral reasons influence the hand hygiene practice among the nurses. There is the possibility of developing risk perception fatigue with time, which causes complacency. The peer behavior has a significant effect on the individual compliance patterns. Lack of consistency in role modeling by the senior staff intimidates compliance among junior nurses. Attitude and motivation towards infection prevention are significant factors of practice. Treatment of behavioral aspects is effective in improving intervention [18].

Methodology:

Descriptive cross-sectional study was conducted at District Headquarter (DHQ) Hospital Dir Upper, Pakistan, among 60 nurses using a universal sampling technique. Data were collected through a self-administered questionnaire to assess nurses' knowledge, practices, and perceived challenges regarding hand hygiene. The analysis was performed using SPSS version 27, employing descriptive statistics and Chi-square tests, with a p-value of <0.05 considered significant. Ethical approval was obtained, and informed consent was secured from all participants while maintaining anonymity and confidentiality.

Results:

4.1. Demographic Analysis

The table presents the demographic and professional characteristics of the nurses (N=60). Most participants were aged 30–39 years, accounting for 46.7% of the sample, followed by 20–29 years (36.7%). A higher proportion of nurses were female (60%) compared to male (40%). Regarding professional experience, 41.7% had less than five years of nursing experience, while 25% had more than ten years. Two-thirds of the nurses (66.7%) reported receiving formal hand hygiene training within the last two years.

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These findings indicate a relatively young and moderately experienced workforce with a majority being female. The data provide important context for interpreting knowledge, practices, and challenges in hand hygiene compliance.

Table 4.1: Demographic Characteristics of Nurses (n = 60)

Variable	Category	Frequency	Percentage (%)
Age (years)	20–29	22	36.7
	30–39	28	46.7
	40–49	8	13.3
	≥50	2	3.3
Gender	Male	24	40
	Female	36	60
Total Nursing Experience	<5 years	25	41.7
	5–10 years	20	33.3
	>10 years	15	25
Hand hygiene training last 2 years	Yes	40	66.7
	No	20	33.3

The age distribution shows that most nurses were aged 30–39 years (46.7%), followed by those aged 20–29 years (36.7%). Only a small proportion of participants were aged 40 years and above, indicating a predominantly young nursing workforce.

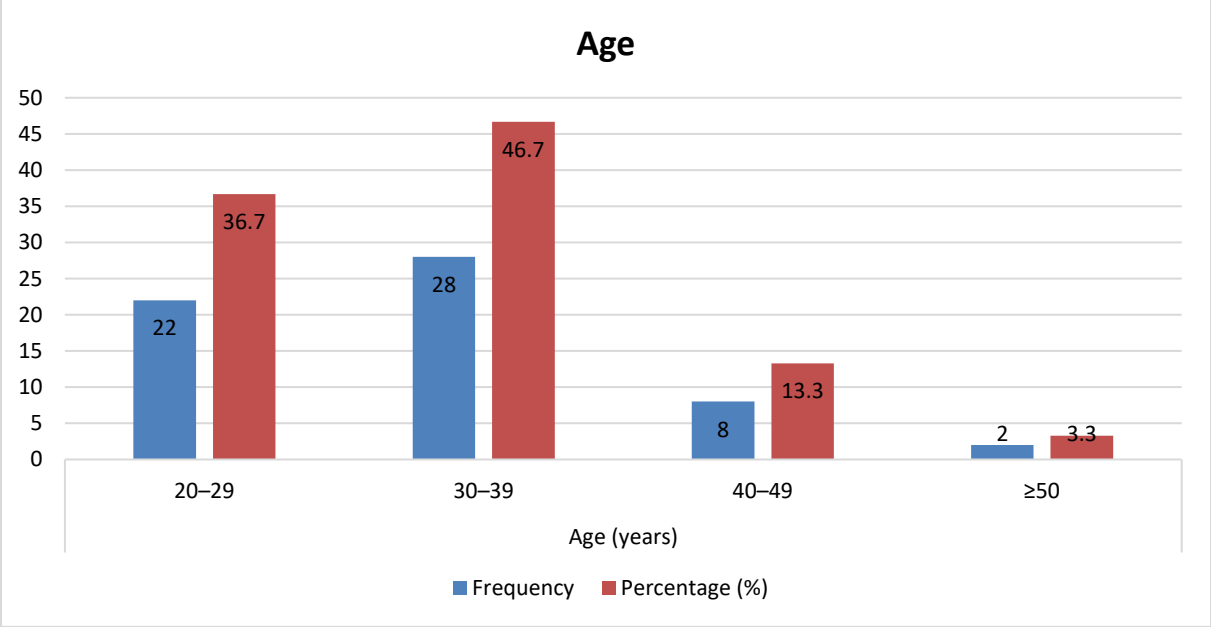


Figure 4.1: Age of Participants

The gender distribution indicates that female nurses constituted the majority of the study participants (60%), while male nurses accounted for 40%. This reflects a female-dominated nursing workforce in the study setting.

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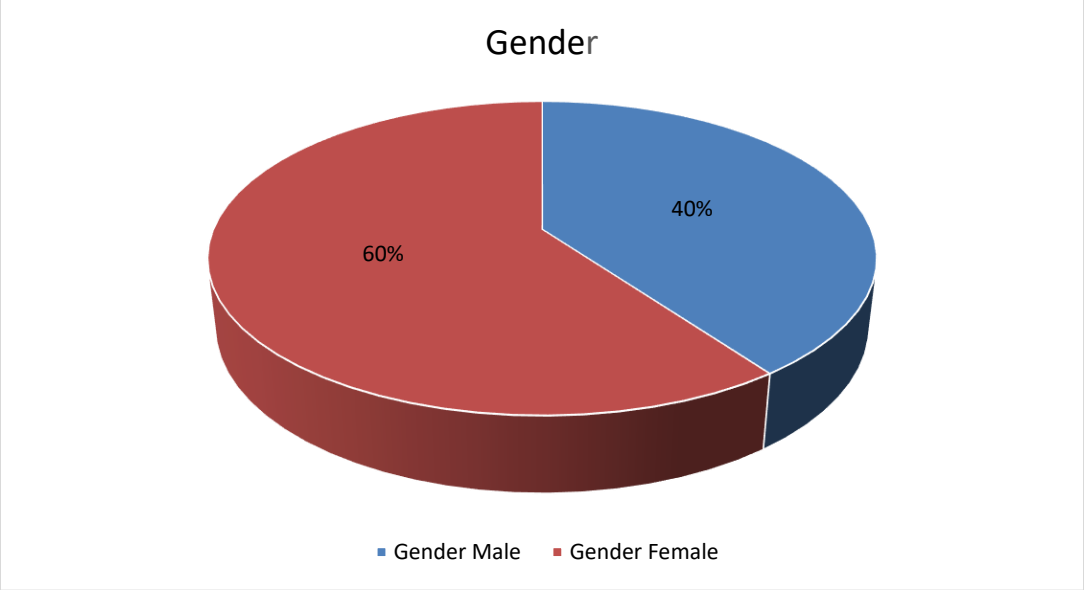


Figure 4.2: Gender of Participants

The results show that most nurses had less than five years of total nursing experience (41.7%), followed by those with 5–10 years of experience (33.3%). Nurses with more than ten years of experience comprised one-quarter of the study population.

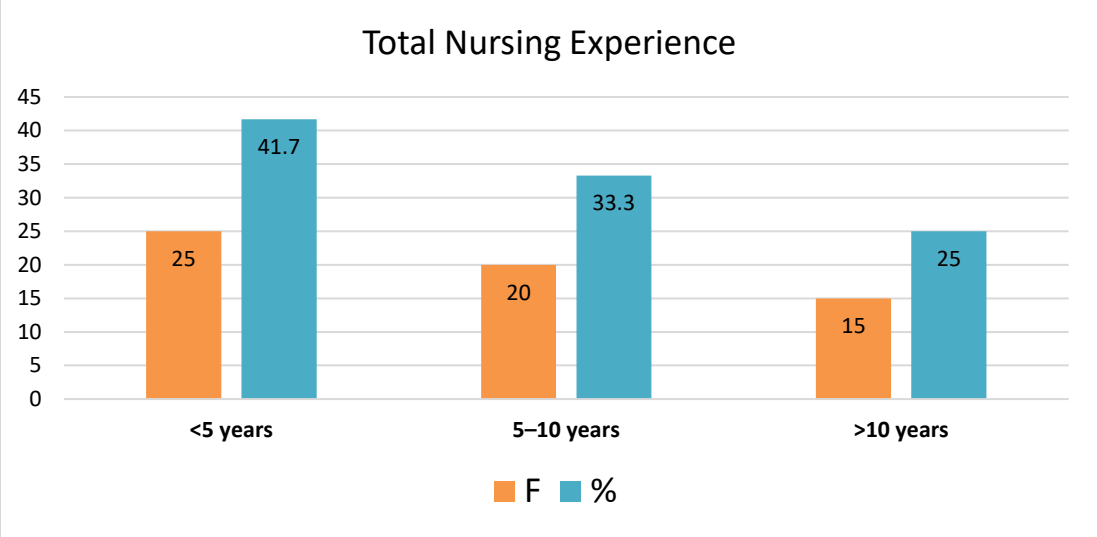


Figure 4.3: Total Nursing Experience of Participants

A majority of nurses (66.7%) reported receiving formal hand hygiene training in the past two years, while 33.3% had not received any recent training. This indicates that most participants had some exposure to updated hand hygiene guidelines.

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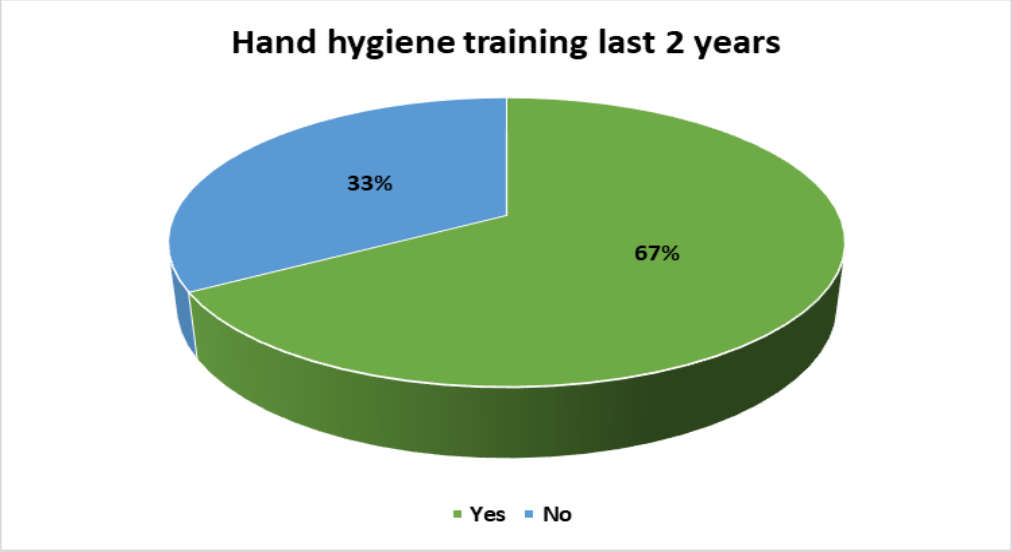


Figure 4.4: Hand hygiene training last 2 years

4.2: Knowledge of Hand Hygiene Among Nurses (N=60)

Table 4.2 summarizes nurses' knowledge regarding WHO hand hygiene guidelines. The majority correctly identified situations requiring hand hygiene, particularly when hands were visibly soiled (91.7%). Most participants (83.3%) could distinguish actions that are not part of the "Five Moments." The correct identification of frequently missed areas of the hands was reported by 70% of nurses. Knowledge gaps were observed in the recommended duration for alcohol-based hand rub, with only 58.3% answering correctly. Overall, the findings indicate moderate to good knowledge among nurses. This suggests that formal training positively influenced awareness of hand hygiene principles. The results highlight areas for targeted educational reinforcement.

Table 4.2: Knowledge of Hand Hygiene Among Nurses (N=60)

Question	Correct Response	Frequency (f)	Percentage (%)
1. Which is NOT one of WHO "Five Moments"?	Before eating	50	83.3
2. Recommended duration for alcohol hand rub	20–30 sec	35	58.3
3. When to use soap & water	When hands visibly soiled	55	91.7
4. Part of hand most missed	Thumbs/fingers	42	70.0
5. Hand hygiene should be performed	At all 5 moments	48	80.0

4.3: Self-Reported Hand Hygiene Practices (N=60)

Table 4.3 illustrates the frequency of self-reported hand hygiene practices among nurses. The highest adherence was observed after exposure to body fluids (75%), while the lowest was after touching patient surroundings (41.7%). About half of the nurses consistently performed hand hygiene before patient contact and after glove removal. A considerable proportion reported "often" practicing hand hygiene in most situations, indicating partial compliance. Some inconsistencies were noted, particularly in non-invasive routine care. These findings reflect the

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influence of workload, availability of supplies, and training on adherence. Overall, nurses demonstrated reasonable but variable compliance with recommended hand hygiene practices.

Table 4.3: Self-Reported Hand Hygiene Practices (N=60)

Situation	Always (f, %)	Often (f, %)	Sometimes (f, %)	Rarely/Never (f, %)
Before touching a patient	30 (50.0)	20 (33.3)	8 (13.3)	2 (3.4)
Before clean/aseptic procedures	28 (46.7)	18 (30.0)	10 (16.7)	4 (6.6)
After exposure to body fluids	45 (75.0)	10 (16.7)	3 (5.0)	2 (3.3)
After touching a patient	35 (58.3)	15 (25.0)	7 (11.7)	3 (5.0)
After touching patient surroundings	25 (41.7)	20 (33.3)	10 (16.7)	5 (8.3)
After removing gloves	30 (50.0)	18 (30.0)	8 (13.3)	4 (6.7)

4.4: Reported Challenges/Barriers to Hand Hygiene (N=60)

Table 4.4 presents the barriers and challenges nurses faced in performing hand hygiene. The most frequently reported barriers were heavy workload (66.7%) and unavailability of alcohol-based hand rub (58.3%). Other common challenges included insufficient training, lack of administrative support, and limited availability of soap and towels. About half of the participants noted peer non-compliance as a factor influencing their practice. Skin irritation from hand hygiene products was also reported by nearly half of the nurses. A smaller proportion believed that gloves eliminate the need for hand hygiene, indicating awareness of correct practice. These findings emphasize the multifactorial nature of challenges affecting compliance.

Table 4.4: Reported Challenges/Barriers to Hand Hygiene (N=60)

Statement	Strongly Agree/Agree f (%)	Neutral f (%)	Disagree/Strongly Disagree f (%)
Alcohol-based hand rub frequently unavailable	35 (58.3)	10 (16.7)	15 (25.0)
Soap/towels not available at sinks	30 (50.0)	12 (20.0)	18 (30.0)
Sinks not conveniently located	25 (41.7)	15 (25.0)	20 (33.3)
Too busy/heavy workload	40 (66.7)	8 (13.3)	12 (20.0)
Skin irritation from hand products	28 (46.7)	12 (20.0)	20 (33.3)
Forget to perform hand hygiene	20 (33.3)	10 (16.7)	30 (50.0)
Insufficient training/reminders	32 (53.3)	10 (16.7)	18 (30.0)
Colleagues non-compliant	30 (50.0)	15 (25.0)	15 (25.0)
Lack of administrative support	28 (46.7)	12 (20.0)	20 (33.3)
Gloves reduce need for hand hygiene	15 (25.0)	10 (16.7)	35 (58.3)

Discussion

The findings of this study reveal a complex duality in the remote work experience. While participants consistently reported higher levels of autonomy and work-life integration, this was often counterbalanced by feelings of professional isolation and the challenge of "switching off" from work. This suggests that the relationship between remote work and well-being is not linear but is instead mediated by individual circumstances and the quality of digital communication infrastructure.(19) These results align with the existing literature on job demands-resources, indicating that while autonomy (a resource) increases, the demands of constant

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connectivity can simultaneously erode the psychological benefits.(20)

Conclusion

In conclusion, this research demonstrates that remote work is a double-edged sword for employee well-being. It confirms that the flexibility offered by working from home can lead to higher job satisfaction, but it also uncovers a significant risk of burnout stemming from digital presenteeism and blurred boundaries. The study underscores the critical need for organisations to move beyond simply offering remote work and to instead proactively design policies that mitigate its psychological drawbacks, ensuring that flexibility does not come at the cost of employee mental health.

Limitations and Recommendations

This study's findings are limited by its cross-sectional design, which captures well-being at a single point in time, and its reliance on self-reported data from a specific industry sector. Consequently, the results may not be generalisable to all populations or account for how well-being fluctuates over the long term. Future research should employ longitudinal methods to track changes in employee well-being as remote work policies evolve. Additionally, it is recommended that subsequent studies investigate the effectiveness of specific interventions, such as virtual team-building exercises or mandatory "offline" hours, in mitigating the isolation and burnout identified here.

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