

Resilience and Hope in Healthcare: A Cluster Analysis of Age, Gender, and Occupation in Medical Workers

Mary Rachelle R Wapano

Xavier University, Philippines

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ABSTRACT

This study examines the relationships among age, gender, job occupation, resilience, and hope in healthcare professionals. This study employs a cross-sectional design to analyze the relationships between resilience, hope, age, gender, and job occupation. Resilience Scale-14 and Hope Scale were employed to measure resilience and hope among diverse healthcare workers. Statistical analyses showed no significant interaction between age and gender on hope.

The study found that hope levels did not significantly differ across age and gender, indicating that hope is a universal psychological construct in healthcare settings. The absence of a moderating effect of job occupation on the resilience-hope relationship indicates that resilience may be a universally beneficial trait for all healthcare roles. Cluster analysis revealed unique patterns within the workforce, highlighting the potential for interventions tailored to specific demographic and occupational profiles. This finding suggests that hope interventions can be applied broadly across demographic groups within healthcare settings. These findings have implications for developing supportive frameworks in healthcare organizations and guiding future policies that aim to enhance resilience and hope among healthcare practitioners.

Keywords: Resilience, Hope, Healthcare Professionals, Age, Gender, Job Occupation

INTRODUCTION

The dynamic relationship, between resilience and hope within the medical field impacts both outcomes and the wellbeing of healthcare providers. Resilience, defined as the capacity to maintain strength and adapt positively in the face of challenges is a quality observed in healthcare professionals as they navigate their demanding roles (Jackson, Firtko, & Edenborough, 2007). Similarly hope, described by Snyder as the ability to envision pathways to achieve goals and motivate oneself through thinking plays a role, in helping individuals overcome stressors in their work environments (Snyder, 2002).

Existing literature lacks exploration of how age and gender intersect with resilience and hope in medical settings. This study aims to fill this gap. The current body of literature lacks an exploration of how factors such, as age and gender intersect with psychological aspects in medical settings (Southwick, Bonanno, Masten, Panter Brick, & Yehuda, 2014). The impact of job roles on resilience and hope in healthcare settings is an area that has not been extensively studied. This gap is significant considering the changing demographics and diverse job roles present, in the healthcare industry.

This study aims to examine the relationships between age, gender, job occupation, resilience, and hope among healthcare professionals. Understanding the interconnected factors that contribute to resilience and hope is essential for developing effective interventions. Interventions aimed at increasing resilience and hope should be tailored to address specific demographic and occupational profiles identified in the study. These insights may lead to enhancing medical professionals' psychological resources, which, in turn, can enhance patient care and practitioner longevity in the field (Luthar, Cicchetti, & Becker, 2000). These findings have the potential to strengthen the psychological well-being of medical professionals, leading to improved patient care and sustained engagement in the field (Luthar, Cicchetti, & Becker, 2000).

The investigation on resilience and hope among healthcare professionals has attracted attention from scholars of late as these concepts are deemed essential for the wellbeing and effectiveness of medical professionals. Resilience is described as a mechanism that supports responses to stress and challenging circumstances important, for individuals working in the demanding healthcare sector (Connor & Davidson 2003). Similarly hope is conceptualized as encompassing the emotional frameworks that empower people to persist in pursuing their objectives despite the uncertainties and pressures of the healthcare setting (Herth, 1992).

Healthcare professionals often struggle to maintain resilience and hope despite recognizing the importance of these internal resources (Mealer, Jones, & Moss, 2012). The widespread issue of burnout and mental health challenges, among staff underscores the need to understand these concepts better (Mealer, Jones, & Moss, 2012). However existing studies have not thoroughly investigated how factors such as age and gender impact resilience and hope. Furthermore the specific effects of healthcare roles, on these aspects have not been adequately explored (Tusaie & Dyer 2004; Luthans, Youssef Morgan, & Avolio, 2015).

This study aims to examine how demographic factors interact with resilience and hope, in healthcare workers. By understanding these relationships, this study may inform the development of strategies and guidelines to improve the wellbeing and satisfaction of healthcare professionals which may lead to patient care quality.

The current body of work, on resilience and hope among healthcare workers is extensive, yet there is a notable gap in research in this area: Specifically there is a lack of studies that explore the diverse aspects of these qualities among groups in the healthcare field (Masten, 2001). Although some studies have offered perspectives they fall short in capturing how resilience and hope change, throughout a healthcare professionals career.

Additionally, the operationalization of resilience and hope suffers from inconsistency, with studies employing a variety of definitions and instruments that challenge the comparability of outcomes (Snyder et al., 1991). This methodological divergence creates barriers to understanding the broader applicability of these constructs across different healthcare settings. Moreover, the specific influences of job roles within healthcare on resilience and hope have been inadequately examined. The current body of knowledge does not adequately reflect the varied experiences of healthcare workers in diverse roles, from frontline clinical staff to support and administrative personnel (Agaibi & Wilson, 2005). Moreover, some studies show inconsistencies in the way resilience and hope are operationalized making it difficult to compare results (Snyder et al., 1991). This difference, makes it hard to understand how widely applicable these concepts are in healthcare environments. Furthermore the specific impact of job positions in healthcare, on resilience and hope has not been thoroughly explored. The existing knowledge does not fully capture the experiences of healthcare workers in roles ranging from frontline clinical staff to support and administrative personnel (Agaibi & Wilson 2005).

To address these limitations, this study investigates how demographic variables such, as age and gender impact the resilience and hope levels of healthcare professionals. Additionally, the present will also investigate the differences of levels resilience and hope among health care professionals.

To investigate the dynamics of resilience and hope within the healthcare profession, this study is guided by the following research questions:

1. Is there an interaction effect between age and gender on hope scores among medical workers?
2. Does job occupation moderate the relationship between resilience and hope?
3. What patterns emerge from cluster analysis?"

The study posits the following hypotheses to explore resilience and hope in the healthcare profession.

H1: There will be a significant interaction effect between age and gender on the hope scores of medical workers, such that the relationship between age and hope will differ by gender.

H2: Job occupation will moderate the relationship between resilience and hope among medical workers, with certain occupations demonstrating stronger associations between these constructs.

H3: Distinct patterns of resilience and hope will be evident when clustering medical workers by age, gender, and job occupation, revealing subgroup-specific profiles that may inform targeted interventions.

METHODS

This study uses a quantitative cross-sectional design to investigate the relationship between resilience, hope, age, gender and job roles among healthcare professionals. A group of 218 healthcare workers is selected from healthcare settings. The participants represent age groups, genders and job positions in the healthcare field meeting the criteria of being employed and participating voluntarily. The tools are used to measure resilience and hope are as follows: Resilience is assessed using the Resilience Scale 14 (RS 14) while hope is measured with the Hope Scale. Demographic information such, as age, gender and job roles are gathered through surveys. Data collection involves distributing surveys to eligible participants. Ethical guidelines ensure consent, voluntary involvement and data confidentiality with approval obtained from the review board.

To examine the data, analysis of variance (ANOVA) is used to evaluate how age and gender interact to impact hope scores, to examine the the effect of job occupation, on the relationship, between resilience and hope a moderation analysis was used. Lastly cluster analysis was used to identify the trends of resilience and hope among healthcare professionals The significance level is established at $p < 0.05$.

RESULTS

The results section discusses the analyses conducted to investigate how resilience and hope interact, among healthcare professionals. The study reveals how age, gender and job type influence resilience and hope. Analysis of Variance (ANOVA) was employed to study how age and gender interact a moderation analysis was used to explore the impact of job type, on resilience and hope and a cluster analysis was conducted to identify patterns of resilience and hope based on factors.

Interaction Effects Between Age and Gender on Hope Scores Among Medical Workers:

The analysis showed no significant main effect of age range on hope scores, $F(1, 214) = 1.53, p = .218$, revealing that the different age did not show significantly different levels of hope. Similarly, there was no significant main effect of gender on hope scores, $F(1, 214) = 0.96, p = .329$, suggesting that males and females did not differ significantly in their levels of hope. The interaction between age range and gender was not significant, $F(1, 214) = 0.18, p = .668$. This shows that the effect of age r on hope scores did not differ significantly between males and females. Table 1 presents the summary of these results

Table 1 Two-Way ANOVA of Hope Scores by Age Range and Gender Among Medical Workers

Source	SS	df	MS	F	p
Age Range	171.81	1	171.81	1.53	.218
Gender	107.65	1	107.65	0.96	.329
Age Range x Gender	20.70	1	20.70	0.18	.668
Residual	24074.30	214	112.50		

Note. SS = Sum of Squares; df = Degrees of Freedom; MS = Mean Square; F = F value; p = p-value.

The lack of significant findings suggests that, within this sample of medical workers, neither age nor gender, alone or in combination, is a determinant of hope scores. These results contribute to the understanding that hope, as a psychological construct, may not be strongly influenced by demographic factors such as age and gender in this population. Further research might explore additional factors that could influence hope, such as work environment, job satisfaction, and personal life circumstances. The analysis did not support the

hypothesis that age and gender would interact to affect hope levels among medical workers. These findings suggest that interventions aimed at increasing hope may not need to be tailored on the basis of age or gender.

The lack of significant findings suggest that among this group of healthcare professionals neither age nor gender whether separately or collectively plays a role, in determining hope scores. These outcomes add to the insight that hope, might not be impacted by demographic variables like age and gender. Other factors might influence levels of hope such as the work environment, job satisfaction and personal life circumstances, not examined in this study. The results did not support the hypothesis that age and gender would interact to affect hope among healthcare professionals.

Job occupation as Moderator between Resilience and Hope among medical workers

A moderation analysis was performed using ordinary least squares regression to investigate whether job occupation moderated the relationship between resilience and hope. The interaction term between resilience (RS-14) and job occupation variable was included in the model.

The results revealed a significant positive relationship between resilience and hope, $\beta = 0.5425$, $t(214) = 5.112$, $p < .001$, with higher resilience linked with greater hope. However, the interaction term between resilience scores and job occupation was not significant, $\beta = 0.0017$, $t(214) = 0.024$, $p = .981$, suggesting that the strength and direction of the relationship between resilience and hope did not vary by job occupation. The coefficients for the categorical variables representing job occupation were not significant, indicating that job occupation, on its own, does not predict hope scores. Table 2 provides the regression coefficients, standard errors, t-values, and p-values for each predictor in the model.

Table 2 Moderation Analysis Summary for Hope Scores

Predictor	Coefficient	Std. Error	t	p
Intercept	55.6768	8.877	6.272	< .001
RS_14	0.5425	0.106	5.112	< .001
Job Occupation (Category 2)	-1.7746	6.054	-0.293	.770
Job Occupation (Category 3)	-1.1760	11.816	-0.100	.921
Job Occupation (Category 4)	-4.4715	17.336	-0.258	.797
RS_14 x Job Occupation	0.0017	0.070	0.024	.981

Note. RS_14 x Job Occupation is the interaction term between resilience scores and job occupation. Predictor job occupation categories are coded relative to a reference category.

The absence of a moderating effect of job occupation on the relationship between resilience and hope suggests that the impact of resilience on hope is consistent across different job roles within the medical field. This study found that while resilience is a significant predictor of hope among medical workers, job occupation does not moderate this relationship. There may be other potential factors which could influence this relationship not examined in this study.

Patterns of Resilience and Hope based on Age, Gender, and j Job occupation

Cluster analysis was conducted to examine natural groupings based on their levels of resilience, hope, age, gender, and job occupation. K-Means clustering was used to identify distinct clusters within the sample set. Prior to clustering, the data were standardized to account for scale differences between variables. The optimal number of clusters was determined through the elbow method and silhouette scores.

Four clusters were identified, each representing a distinct combination of the variables considered. The analysis yielded the following cluster characteristics:

Cluster 0 is characterized by younger medical workers in the early stages of their career, predominantly female, with high resilience and hope scores. This cluster is the second largest, with 40 individuals, suggesting a significant subset of the workforce with high psychological well-being. Cluster 1 includes older, predominantly female medical workers, possibly in more senior roles, as indicated by their age distribution. This cluster exhibits high resilience and the highest hope scores, consisting of 49 individuals, which may reflect the support structures in place for more established staff. Cluster 2, the largest cluster with 111 individuals, consists of younger workers, primarily female, in mid-level job occupations. This group has slightly lower resilience and hope scores compared to Cluster 0, pointing towards potential areas for enhanced support. Cluster 3 contains the smallest group, with 18 individuals, and includes slightly older workers, predominantly female, in job occupation category 4. This group has the lowest average scores for both resilience and hope, which could be of concern for employers and policymakers. The size of each cluster and the mean values for each of the variables are presented in Table 3.

The cluster analysis provides insight into the profiles of health care workers based on resilience, hope, and demographic and job role. Clusters with lower average scores for hope and resilience, particularly Cluster 3, may benefit from targeted interventions. In contrast, Clusters 0 and 1, with higher hope and resilience scores, may serve as bases for best practices among healthcare professionals. The findings could inform human resources strategies, policy development, and the design of support systems aimed at improving medical workers' well-being. The cluster analysis found groups, within the staff showing different levels of resilience and hope. This indicates the importance of providing support for healthcare workers' wellbeing specifically focusing on groups with lower scores.

Table 3 Cluster Characteristics of Medical Workers Based on Resilience, Hope, and Demographic and Occupational Data

Cluster	Average Age	Predominant Gender	Job Occupation Category	Average Resilience Score	Average Hope Score	Size
0	27.4	Female	3	83.0	99.8	40
1	41.5	Female	1	82.8	100.6	49
2	28.6	Female	2	81.0	98.0	111
3	29.2	Female	4	80.3	95.2	18

DISCUSSION

This section summarizes the results from the statistical analyses examining the relationships between resilience, hope, age, gender, and job occupation among healthcare workers:

The study revealed no significant main effects of age or gender on hope scores, nor was there a significant interaction between these demographic factors. Similarly, job occupation did not moderate the relationship between resilience and hope, indicating that a stable relationship between these constructs across different healthcare roles. Cluster analysis revealed distinct profiles within the workforce, specifically highlighting a subgroup with low levels of resilience and hope that might benefit from supportive interventions.

These findings contribute to the understanding that hope, as a psychological construct, may not be strongly influenced by demographic factors such as age and gender in this particular occupation. This is aligned with previous research which has demonstrated the complex relationships of factors which contributing to psychological resilience in healthcare settings (Britt et al., 2016; Ferreira & Gomes, 2021; Kelly et al., 2021). The present results is in contrast with other studies which suggest demographic variables may influence

psychological outcomes (Southwick et al., 2014), and that they support the idea that resilience may act as a universal protective factor across different roles within healthcare (Ferreira & Gomes, 2021).

This study's limitations include the cross-sectional design, reliance on self-reported measures, and the lack of longitudinal data to assess changes over time. Further research is may be necessary to examine the additional factors which impact hope and resilience, such as organizational support and the impact of different stressors (Kelly et al., 2021). Future investigations may focus on the developing interventions tailored to the identified clusters with lower average scores and examining the impact of such interventions on healthcare workers' well-being. Longitudinal studies could provide a comprehensive understanding of the development of resilience and hope over time (Kelly et al., 2021).

CONCLUSION

This study has examined the interrelations of age, gender, and job occupation with resilience and hope among healthcare workers. While statistical significance was not demonstrated in the interaction effects between age and gender on hope scores, nor in the moderating role of job occupation on the resilience-hope dynamic, the findings shows some potential clinical significance.

The absence of statistical significance in demographic impacts does not decrease the clinical importance of considering these factors in the healthcare setting. That the results show that there is no difference in hope and resilience across demographics, suggest that the development of supportive interventions may be universally applied across demographic groups and not compartmentalized.

Even as the identification of clusters within the medical workforce based on resilience and hope patterns did not show statistically significance, this still offers a potentially meaningful avenue for targeted intervention. Healthcare workers with lower resilience and hope scores, regardless of age or gender, may benefit from support programs aimed at enhancing these resilience and hope, which are essential to both the healthcare practitioners' well-being and patient care quality. The clinical implications of these findings is important for healthcare systems to invest in resilience-building and hope-inspiring strategies. Such strategies can include strategies which can help the workforce cope with the demands of the profession and potentially improve the healthcare outcomes for patients. Future research could also build upon these findings: to further examine the nuanced relationships between demographic factors and psychological constructs such as resilience and hope. Further research could also assess the effectiveness of broad-spectrum resilience and hope interventions, perhaps revealing unrecognized benefits that statistical analysis alone may not capture.

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