Exploring the Resilience of School Principals: Demographic Determinants and Institutional Influences in a Developing Region

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Abstract

Background: School principals are often challenged in exercising their authority, especially during educational policy adjustments. Resilience is one factor that can overcome these problems. However, the exploration of resilience, especially among school principals, is still limited, especially in terms of demographic factors such as age, work experience, and education level.

Objective: The current study was conducted to obtain an overview of principals' resilience, determine the relationship between principals' demographics (age, work experience, and education level) and resilience levels, and compare principals' resilience in public and private schools.

Methodology: The present study used a quantitative approach, with a cross-sectional design on 137 principals using the Connor-Davidson Resilience Questionnaire (CD-RISC). Pearson correlation analysis was used to test the relationship between demographic variables and resilience scores. In contrast, multiple regression analysis was used to see how social support and work experience simultaneously influence principals' resilience levels.

Results: The exploratory results suggest that the demographic factors of age, work experience, and education level significantly correlate with principals' resilience scores. The average resilience score of public school principals (76.24) was slightly higher than that of private school principals (74.20). However, the difference was not statistically significant ($p > 0.05$).

Unique Contribution: The study's results offer new insights into demographic factors that influence principals' resilience and provide empirical evidence, in agreement with previous research, that there are no differences between public and private school principals.

Conclusion: Principals' resilience is influenced by age, work experience, and education level, but there is no significant difference between public and private principals. Developing resilience with training and psychological interventions can be one strategy for improving principals' performance.

Key Recommendation: Resilience development programmes are needed for school principals, especially young or newly appointed principals, to strengthen their leadership qualities in the future.

Keywords: demographics, work experience, principal, education, resilience

Introduction

Resilience in the context of education and school leadership is a fundamental ability that enables principals to survive and thrive in complex environments (Isaacs, 2012; Kimhi et al., 2024). Principals are under pressure from various aspects, such as academic demands, policy changes, limited resources, social dynamics, bureaucratic pressure, and lack of support from policymakers (Vergara et al., 2024). Resilience empowers principals to remain optimistic, focused, and flexible in finding innovative alternative solutions amid difficult situations (Chu et al., 2024). Therefore, resilient principals can lead well and make the right decisions (Burns & Anstey, 2010; Marta et al., 2023), thus creating a conducive environment for teachers and students to achieve maximum school performance (Huang et al., 2024). The principal's resilience impacts the school's overall performance (Karairmak, 2010). The principal's resilience impacts school performance, maintaining enthusiasm and motivation in difficult situations, being a role model for students and the school community, and encouraging positivity and commitment to achieving academic and non-academic goals (Jeong et al., 2015; Singh & Yu, 2010).

Resilience studies of school principals in different regions suggest that internal and external factors influence their ability to deal with challenges (Al-Omari, 2017). Leadership skills, managerial ability, and emotional intelligence are internal factors that can contribute to a principal stress manage its performance in problem solving (Isaacs, 2012). By contrast, external factors refer to the support from school communities (e.g., teachers, parents, and education authorities), as they can offer the necessary motivation and resources for leadership sustainability (Cheng et al., 2020). (2017) research that responsive education policies and socioeconomic conditions in school settings were also major determinants of how resilient principals can become. Principals with professional development and support networks can withstand stressors from policy changes, prickly student discipline issues like fighting or suspensions, and school financial crises (Easterly III & Myers, 2019).

Glas et al. (2021) examined the resilience of school principals, focusing solely on leadership, institutional support and level between demographics in environmental conditions for school with no consideration given to age, work experience or education. Some demographic characteristics, however, may also affect the ability of principals to surmount problems (Suárez et al., 2024). For example, Aibin et al., (2023) found that principals who are older or more experienced are effective enough in conflict self-management and decision-making compared to their relatively younger or beginning counterparts. Meanwhile, older principals have challenges, including adjusting to technological advances and changing regulations within education (Suárez et al., 2024).

A previous study presented a model to evaluate resilience in school principals, focusing on their role in managing and dealing with difficulties related to management and academic policy. However, adequate research is required to understand better how demographic and environmental factors at a local level affect resilience. For instance, regions have unique traits that could affect how the resilience of principals differs. This study fills a void that earlier research has not yet covered by investigating some local aspects of principals' education levels, age and job experiences impacting their adaptability and the capacity to solve problems.

The Objective of The Study/Hypotheses

The current study sought to fulfil three major goals connected to principals' resilience. Initially, the study attempted to examine principals' resilience using the Connor-Davidson Resilience Questionnaire (CD-RISC), a validated instrument for assessing an individual's capacity to cope with stress and adversity. The second goal was to investigate the relationship between demographic factors such as age, work experience,

and education level and principals' resilience to understand how personal traits influence principals' ability to manage stress and challenges on the job. The third goal is to identify the elements influencing principals' resilience to conduct a more in-depth analysis of the essential parts of resilience building. The following hypotheses were tested in the study:

H1: There is a significant positive relationship between principals' age and their level of resilience,

H2: Length of service as a principal has a significant positive effect on the level of resilience,

H3: Principals with a higher level of education (e.g., master's or doctoral degree) have a higher level of resilience than those with only a bachelor's degree (S1).

H4: School type (public or private) has no significant influence on the level of resilience of school principals.

Methods

Study design

The current study used a quantitative technique with a cross-sectional survey design, as outlined by Creswell (2012), to evaluate school principals' resilience levels and contributing factors. The cross-sectional approach allows for the simultaneous collection of data from a representative sample of the principal population, resulting in a full picture of their resilience. The quantitative technique also enabled the investigation of the relationship between several demographic characteristics, such as age, work experience, and educational level, and the measured level of resilience. They are achieving the objectives of several hypotheses based on resilience theory and demographic variables.

Principal demographic information

The study was conducted in Boyolali Regency and involved 137 subjects, including public and private school principals. Data were collected through a survey technique filled out by all subjects, namely 137 school principals, to obtain comprehensive information about their level of resilience. The selection of a sample size of 137 principals is based on the consideration that all data from each subject can be analysed without exception so that the study results can provide a representative picture and cover all variations that may exist among principals in the region. As a result, the current study is expected to provide reliable findings about the factors that influence school principals' resilience in public and private schools, particularly in the Boyolali area. Table 1 shows the demographics of the principals.

Table 1. Principal Demographic Information (n = 137)

Category	Subcategory	N	Percentage
Gender	Male	107	78,10%
	Female	30	21,90%
Age	≤ 30	4	2,92%
	31-36	15	10,95%
	35-40	28	20,44%
	41-50	31	22,63%
	> 50	59	43,07%
Education level	Undergraduate	46	33,58%
	Master degree	89	64,96%
	Doctoral degree	2	1,46%
Type of institution	Public schools	84	61,31%
	Private schools	53	38,69%
Years of work experience	≤ 3	10	7,30%
	3-5	22	16,06%
	6-10	32	23,36%

11-20	49	35,77%
> 20	24	17,52%

Measurements

The Connor-Davidson Resilience Questionnaire (CD-RISC) was utilised in this study to assess principals' resilience. The CD-RISC is a 25-item questionnaire that assesses five characteristics influencing individual resilience (Liu et al., 2024; Londero & da Rocha, 2024; Teo et al., 2024). The first aspect is personal competency, which assesses a person's belief in their ability to overcome obstacles. The second element is tolerance for negative affect, which measures an individual's ability to persevere in hardship or pressure. The third component, positive acceptance of change and adaptation to different conditions, evaluates a person's adaptability and capacity to deal with unanticipated changes. The fourth aspect is the perception of control, which assesses an individual's ability to control the circumstance. Finally, the fifth aspect is spiritual influence, which refers to the concept that spiritual powers can help us deal with life's obstacles. The CD-RISC pilot test yielded a Cronbach's alpha reliability of 0.83. Then, proceed with confirmatory factor analysis (CFA). The results of CFA testing consisting of Chi-Square value parameters = 121.45, *df* = 135; Comparative Fit Index (CFI) 0.91 and Tucker-Lewis Index (TLI) 0.92, Root Mean Square Error of Approximation (RMSEA) 0.07. The CFA results indicate that the CD-RISC instrument has a good empirical model fit.

Data collection procedure

The research data was collected by distributing questionnaires directly to the respondents. The process began by briefly explaining the purpose, procedure, and how to complete the questionnaire to the principals. The researcher then gave the questionnaires to the principals to complete once the respondents understood the purpose of the study. The direct distribution approach was applied to ensure that all respondents had an equal opportunity to understand the instructions and to reduce errors that could occur if the questionnaire was administered indirectly. Furthermore, direct distribution allowed the researcher to ask for clarification regarding certain statements on the questionnaire items. After the respondents had completed the questionnaire, the researcher collected and analysed the questionnaires.

The implementation of data collection in the study took five weeks, starting with distributing questionnaires, filling them in with respondents, and collecting completed questionnaires. Furthermore, to maintain the confidentiality and anonymity of respondents, several preventive measures were taken, including (1) before the questionnaire filling began, each respondent had explained the purpose of the study, participation was voluntary, and had the right not to answer certain questions and withdraw from the study at any time without any consequences, (2) the questionnaires distributed did not contain personal information such as names or other specific identities, but used anonymous identification codes or numbers to maintain data confidentiality, (3) the research findings were reported in aggregate, without mentioning individual identities, so that no respondents could be identified from the published research findings.

Data Analysis

The data analysis technique in this study aims to describe, understand, and predict the relationship between the variables studied, so analytical techniques include descriptive analysis, correlation analysis, and regression analysis. Descriptive analysis provides an overview of data characteristics, including summary statistics such as mean, median, standard deviation, and frequency distribution of research variables. Correlation analysis was used to assess the strength of the relationship between variables, using Pearson's correlation coefficient between numerical variables between principals' resilience and other variables such as social support and job stress. Multiple regression analysis was used to see the extent to which social

support and work experience simultaneously affect the principal's level of resilience. Multiple regression analysis assesses the relationship's strength and predicts the dependent variable's value regarding the independent variable or combination of independent variables.

Results

Distribution of Resilience Based on Respondent Characteristics

This section presents the distribution of resilience scores among school principals based on demographic characteristics. The analysis explores how factors such as gender, age, education level, type of institution, and years of work experience influence resilience (Table 2).

Table 2. Distribution of Resilience Based on Respondent Characteristics

Category	Subcategory	M (SD)	n	Percentage
Gender	Male	76.12 (6.22)	107	78,10%
	Female	74.45 (6.58)	30	21,90%
Age	≤ 30	72.11 (5.98)	4	2,92%
	31-36	73.23 (6.30)	15	10,95%
	35-40	74.88 (6.12)	28	20,44%
	41-50	75.46 (6.55)	31	22,63%
	> 50	76.89 (6.50)	59	43,07%
Education level	Undergraduate	74.02 (6.38)	46	33,58%
	Master degree	75.99 (6.21)	89	64,96%
	Doctoral degree	78.50 (6.45)	2	1,46%
Type of institution	Public schools	76.24 (6.10)	84	61,31%
	Private schools	74.20 (6.33)	53	38,69%
Years of work experience	≤ 3	72.50 (6.50)	10	7,30%
	3-5	73.89 (6.45)	22	16,06%
	6-10	74.76 (6.30)	32	23,36%
	11-20	75.92 (6.35)	49	35,77%
	> 20	77.21 (6.15)	24	17,52%

The result of the resilience distribution based on the respondents' characteristics revealed interesting findings. According to the respondents' characteristics, the resilience of male principals is only slightly higher than that of female principals, with an average of 76.12 (SD = 6.22), while the resilience of female principals is 74.45 (SD = 6.58). The difference in resilience based on gender indicates a tendency for male principals to be more resilient than female principals. The average age revealed that age also affects resilience, i.e., the higher the age, the higher the resilience. The age group ≤ 30 years had the lowest resilience, 72.11 (SD = 5.98), while the >50 groups exhibited the highest resilience, 76.89 (SD = 6.50). It suggests that, with time, novice principals have had more experience dealing with tensions in carrying out their duties. Education level also seems to play a role in resilience. Respondents with a bachelor's degree had an average resilience of 74.02 (SD = 6.38), while master's and doctoral degree holders showed higher averages of 75.99 (SD = 6.21) and 78.50 (SD = 6.45), respectively. Even though only a few respondents were doctoral degree holders, this suggests that additional knowledge and skills acquired through education impact principals' resilience. Furthermore, principals working in public schools appear to have higher average resilience than private schools, at 76.24 (SD = 6.10) and 74.20 (SD = 6.33), respectively. Public schools' more stable and supportive working environment may contribute to this result. Respondents with ≤ 3 years of experience had the lowest resilience, at 72.50 (SD = 6.50), while respondents with > 20 years of experience had the highest resilience, at 77.21 (SD = 6.15). The results indicate that the longer the work experience, the higher the resilience. It happens due to the accumulation of skills to face challenges and work pressures that are better over time.

Correlation Analysis of Resilience with Demographic Factors

The results of the correlation analysis, presented in Table 3, generally show a significant positive relationship between demographic factors (age, length of service, and education level) and principal resilience.

Table 3. Correlation Analysis of Resilience with Demographic Factors

Demographic Factors	Resilience	Age	Years of work experience	Education level
Resilience	1	0.42**	0.39**	0.30*
Age	0.42**	1	0.55**	0.20*
Years of work experience	0.39**	0.55**	1	0.35*
Education level	0.30*	0.20*	0.35*	1

$**p < 0.01$; $*p < 0.05$

The results of the correlation analysis between age and resilience show a significant positive correlation between age and principals' resilience level ($r = 0.42$, $p < 0.01$). The positive correlation between age and resilience indicates that the older the principal, the higher the level of resilience. The relationship between length of service and resilience indicates that length of service as a principal also has a significant positive correlation with resilience ($r = 0.39$, $p < 0.01$). The longer the principal's experience in office, the higher the level of resilience. The relationship between education level and resilience shows a significant positive correlation between education level and resilience ($r = 0.30$, $p < 0.05$). Principals with higher levels of education tend to have higher levels of resilience. The relationship between age and length of tenure indicated that age and length of tenure had a strong positive correlation ($r = 0.55$, $p < 0.01$), indicating that older principals tend to have longer tenure experience. The relationship between age and education level has a weak but significant positive correlation ($r = 0.20$, $p < 0.05$), indicating that older age slightly correlates with higher education levels. The relationship between length of service and education level indicates a significant positive correlation between length of service and education level ($r = 0.35$, $p < 0.05$), indicating that principals with higher education tend to have longer work experience.

Regression Analysis for Predictors of Resilience

The regression analysis results obtained a value of $R^2 = 0.27$, indicating that 27% of the variation in resilience levels can be explained by the demographic variables (age, length of service, education level, and type of school). The Adjusted R^2 value = 0.24 indicates a more conservative R^2 adjustment to the number of predictors in the model, which still indicates that about 24% of the variability in resilience can be explained by the variables of age, length of service, education level, and type of school. The detailed regression analysis results are presented in Table 4.

Table 4. Regression Analysis for Predictors of Resilience

Variable	Coefficient (*B*)	Std. Error	*p-value*	Significance
Intercept	60.35	4.45	0.000	Significance
Age	0.32	0.08	0.000	Significance
Years of work experience	0.29	0.09	0.002	Significance
Education level	1.55	0.68	0.024	Significance
Type of institution	-0.95	1.03	0.359	Not Significant

The intercept value in Table 4 shows that if all independent variables are equal to zero, the predicted value of resilience is 60.35. Each one-year increase in the age of the principal correlates with a 0.32 increase in the resilience score. This relationship was significant at the $p < 0.01$ level—each additional year of work experience as a principal correlated with an increase in resilience score of 0.29. Principals with a higher level of education (master's or doctoral degree) had a resilience score of 1.55 points higher than principals

with a bachelor's degree. This relationship is significant at the $p < 0.05$ level. School type (public vs private) had no significant effect on resilience levels, with a negative coefficient of -0.95, indicating a slight decrease in resilience in private schools. However, this relationship was not significant ($p > 0.05$).

Discussion

The findings suggest that demographic factors such as gender, age, education, work experience, and type of institution (public or private) significantly contribute to resilience. Male principals tended to be more resilient than females, while older age and longer work experience showed a significant increase in resilience. Generally, male principals had higher resilience than their female colleagues, while higher age and longer work experience significantly increased resilience. Therefore, with increasing age and experience, principals are better able to deal with pressure, as they have become accustomed to complex situations in leadership over time. Nonetheless, the research findings present the reality of principals in the Boyolali district, where principals with higher work experience and education are generally better prepared to meet demands about administrative skills, problem-solving, policy changes, or unexpected situations in the school environment. Meanwhile, job stability in public schools can provide facilities and support for the level of resilience of school principals (Gucciardi et al., 2011).

The results of the current study support previous findings from Turbay et al. (2024) that factors affecting principals' resilience, including age and education level, significantly affect principals' ability to be resilient. The present findings are consistent with similar research data that principals aged 34 years and above have higher scores in terms of resilience (Glas et al., 2021; Halkiadakis et al., 2023). It also aligns with increased opportunities for skill development to deal with challenges (Gao et al., 2021; Qi et al., 2024). Similarly, the results of this study confirm that higher education, such as master's and doctoral degrees, correlates with higher resilience, as has been reported in previous studies, where education is thought to enhance problem-solving and challenge-response skills (Martinez et al., 2021; Wassie et al., 2023)

Nevertheless, some new elements are found in the study, namely that although male principals exhibit slightly higher resilience than females, this difference is quite small (Ballard et al., 2024; Gutierrez-Lopez et al., 2019) It reflects the local gender dynamics in the Boyolali district, which differs from studies in other regions, where gender is not always the main determinant of resilience (Aibin et al., 2023; Yan et al., 2023). This study also found that the type of institution (public or private) did not significantly influence principals' resilience, which contradicts previous studies that mentioned that principals in public schools usually have higher resilience due to a more stable working environment. However, this difference could be due to contextual factors, such as the similarity of operational challenges faced by principals in both types of institutions, including local socio-economic characteristics, work culture, and education policies at the local level (Broche-Pérez et al., 2022; Isaacs, 2012).

Potential Impact on Contemporary Issues

The level of resilience found can also contribute to improvements in education quality and student well-being. Resilient principals are better able to lead with poise and confidence in crises, which in turn can create a more stable and supportive learning environment for students. For example, resilient principals can more quickly adapt to distance learning, develop effective crisis management strategies, and maintain good communication with teachers and parents, helping minimise the pandemic's negative impact on student learning outcomes. The results expand knowledge about strategies or policies to improve principals' resilience. The finding that age, work experience, and education have a significant influence provides a basis for more targeted capacity development strategies. Therefore, mentoring and training programs for younger or more recent principals could focus on strengthening resilience through sharing experiences with more senior principals. Furthermore, policies to increase principals' access to further education could contribute to increased resilience. Therefore, the study's results confirm previous findings and provide practical guidance for formulating more effective policies in supporting school principals.

Limitations of the Study

Several limitations of the study need to be considered in the interpretation of results and generalisations. First of all, the sample size is relatively small. Although the data collected provided valuable insights into the issue of principal resilience in Boyolali District, the relatively small sample size limits the ability to generalise the findings to a wider population, either at the national level or in other regions with different socio-cultural characteristics. The limited sample size may also affect the statistical power, so it is possible that some significant relationships need to be detected in the analysis results. Another limitation is using a cross-sectional research design, which only takes data at one point. It does not allow researchers to assess changes in principals' resilience over time or how resilience develops in the face of new challenges, such as changes in education policy.

Recommendations for Further Research

The identified limitations of the study provide some suggestions for future research. Future research could use a longitudinal research design to examine the development of principals' resilience over time. Thus, it can increase knowledge about changes in resilience and what factors affect them. In addition, future research is expected to increase the sample size and include a wider population, both demographically and geographically, for future research to increase external validity. For example, the participants of this study were principals with different socio-educational backgrounds from all regions or provinces. Future research also needs to expand the number of variables measured, such as social support from the community, collaborative leadership and the relationship between the two, school financial conditions, administrative workload and so on, to know in more detail what influences principals' resilience. In addition, it would be interesting to explore some psychological dimensions, such as self-efficacy or emotional support, to provide a clearer picture of how resilience affects principals' performance.

Conclusion and Recommendations

The conclusion of this study suggests that the resilience level of school principals in the Boyolali district is influenced by various demographic factors such as age, length of service, and education level. Older principals with more experience working as educators and higher levels of education tend to show higher levels of resilience, which aligns with their ability to cope with pressures and challenges in the educational context. Although there was a difference in the level of resilience between principals working in public and private schools, this difference was not statistically significant, suggesting that the type of educational institution is not a major determinant in principals' resilience. Another conclusion from the study found that principals' resilience was positively and significantly correlated with age and work experience, but the correlation with education level was weaker. The findings provide insights into the factors that influence principals' resilience in the face of challenges and suggest that developing resilience through experience and training could be key to improving school leadership performance in the future.

Conflict of interest

The authors hereby declare that no conflict of interest exists

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