



Evaluation of Educational and Occupational Determinants on Societal Compliance with Health Protocols During the Pandemic Period in Indonesia

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Abstract

While non-pharmaceutical interventions are critical for pandemic mitigation, empirical evidence regarding the structural and socioeconomic determinants of public compliance during epidemic transitions remains fragmented in developing economies. Existing literature primarily focuses on broad epidemiological trends without identifying how specific demographic strata navigate behavioral adherence during the pandemic transition phase. To bridge this literature gap, this study investigates the demographic and occupational determinants of health protocol compliance in Indonesia, establishing an analytical framework to differentiate between self-directed preventive behaviors and institutionally enforced adherence. A quantitative cross-sectional study was conducted using a digital convenience sampling strategy across Indonesian provinces. Data were collected from 506 validated respondents via a structured 35-item instrument evaluating behavioral adherence, implementation process, and environmental readiness. Bivariate inferential analyses were conducted using Pearson's Chi-Square tests at a significance threshold of $p < 0.05$ to examine relationships across demographic and occupational strata. Educational attainment significantly predicted active, self-directed preventive behaviors, specifically handwashing frequency ($p = 0.001$) and physical distancing ($p < 0.001$). Conversely, occupational status strongly governed compliance with workplace-regulated measures, including temperature screenings ($p = 0.001$), mask utilization ($p < 0.001$), and hand hygiene ($p < 0.001$), with formal sector personnel exhibiting significantly higher adherence than self-employed entrepreneurs. However, universal administrative mandates showed no significant variation by education level ($p > 0.05$), and physical distancing remained uniform across occupations ($p = 0.195$). These findings demonstrate that public compliance is bifurcated into institutionally enforced adherence and cognition-driven adherence. Effective epidemic containment requires dual-track intervention strategies, maintaining administrative enforcement in formal workplaces while deploying targeted educational outreach for informal and independent workforces.

Keywords: COVID-19, Public Health Compliance, Health Behavior, Occupational Health, Health Literacy.

INTRODUCTION

The global transmission of coronavirus disease 2019 (COVID-19), accelerated by international mobility and asymptomatic viral shedding, has precipitated an unprecedented

public health crisis (Bai et al., 2020; Anand et al., 2021). In the absence of immediate pharmaceutical cures during the initial stages of the pandemic, governments worldwide relied heavily on non-pharmaceutical interventions (NPIs) to curb viral dissemination and alleviate the burden on healthcare infrastructure (Perra, 2021). Similar to global trajectories, Indonesia experienced a rapid escalation of infections following its first confirmed cases in March 2020 (Dwinantoaji & Sumarni, 2020). In response to the economic and social ramifications of prolonged lockdowns, the Indonesian government transitioned into the new normal era, a policy paradigm that restored economic activities under the mandatory enforcement of stringent health protocols, including universal masking, hand hygiene, and interpersonal physical distancing (Buana, 2020; Triyono et al., 2024).

Despite the establishment of these mandatory health measures, the success of NPIs is fundamentally contingent upon widespread societal compliance and sustained behavioral modification (Bavel et al., 2020; Glaubitz & Fu, 2024). Epidemiological surveillance data from the Indonesian COVID-19 Task Force highlighted an alarming compliance deficit during the transition period. By early 2021, 99 districts and municipalities recorded overall protocol adherence rates below the critical 60% threshold. Public mask utilization exhibited a sharp longitudinal decline, dropping from 83.67% in September 2020 to 39.51% by December 2020. Severe non-compliance was particularly pronounced in high-density public venues, with adherence falling to 64.54% in dining establishments and 77.94% in sports facilities, while 109 regions failed to achieve basic physical distancing standards. This persistent behavioral resistance in everyday social settings represents a critical vulnerability in epidemic containment in Indonesia, exacerbating transmission risks and elevating mortality rates among vulnerable populations (Buana, 2020; Hennida et al., 2025).

Understanding the determinants of public compliance requires examining health behaviors through established socio-behavioral frameworks. According to the Health Belief Model (HBM), an individual's adherence to preventive protocols is governed by their cognitive appraisal of perceived susceptibility, perceived severity of the disease, and the perceived benefits versus barriers of enacting the behavior (Cai et al., 2026; Clark et al., 2020). Similarly, the Theory of Planned Behavior (TPB) posits that adherence is shaped by subjective social norms, individual attitudes, and perceived behavioral control, which are heavily influenced by underlying socioeconomic and structural factors (Dalimunthe & Kesuma, 2026; Wolff, 2021). In developing economies such as Indonesia, structural determinants, specifically educational attainment and occupational structure, play a pivotal role in shaping these cognitive and behavioral constructs. Higher educational attainment frequently correlates with enhanced

health literacy, enabling individuals to critically process epidemiological risks and adopt self-directed protective behaviors (Liu et al., 2023; Y. Ning et al., 2020). Conversely, occupational status dictates an individual's operational environment; formal sector employees operate under rigorous institutional oversight and safety mandates, whereas self-employed and informal workers navigate decentralized environments lacking systematic administrative enforcement (Ladiwala et al., 2021).

Despite the growing body of literature on pandemic response, a significant research gap remains in understanding how socio-demographic strata differentially influence compliance behaviors during epidemic transitions in developing nations. Existing studies primarily present broad epidemiological descriptions or evaluate public knowledge in isolation, often overlooking the intersection between formal institutional mandates and individual socioeconomic capacity (Liu et al., 2023; Y. Ning et al., 2020).

To bridge this analytical gap, this study aims to evaluate the demographic and occupational determinants of public compliance with COVID-19 health protocols during the pandemic transition period in Indonesia. By anchoring the empirical findings within socio-behavioral theory, this research provides a nuanced evaluation of community adherence, offering actionable insights for designing targeted, sector-specific public health interventions during epidemic transitions.

METHODS

This quantitative study utilized an observational cross-sectional design to evaluate public adherence to mandated COVID-19 health protocols during the pandemic transition period in Indonesia. The research protocol adhered strictly to the ethical principles outlined in the Declaration of Helsinki and received formal institutional approval from the Health Research Ethics Committee of the Health Polytechnic of the Ministry of Health Medan under permit number 01.996/HREC/Health Polytechnic of the Ministry of Health Medan 2020. Prior to accessing the digital survey, all participants were presented with an informed consent preamble detailing the study's objectives, voluntary nature, and confidentiality guarantees. Electronic consent was a mandatory prerequisite to proceed.

The target population comprised Indonesian citizens aged 15 years or older who participated in socio-economic or educational activities outside their homes during the pandemic transition period. Participants were recruited across various Indonesian provinces using a non-probability snowball convenience sampling method distributed through digital channels, such as professional networks, email broadcasts, and instant messaging platforms.

The study excluded individuals who were strictly quarantined or isolated during the previous four weeks, as well as incomplete or duplicate entries. Out of 533 initial submissions, 27 responses were removed based on the eligibility criteria, resulting in a final validated sample of 506 respondents ($n = 506$).

Data collection was executed using a structured, self-administered digital questionnaire deployed via Google Forms, which comprised 35 evaluative items divided into three core domains: socio-demographic and occupational characteristics, workplace and environmental preparedness, and health protocol compliance behaviors.

Prior to data collection, the research instrument was validated for content by three public health experts and tested for construct validity through a pilot study of 30 participants who were excluded from the final sample. The 35-item questionnaire demonstrated strong internal consistency, with a Cronbach's alpha of 0.842. Data were cleaned and analyzed using IBM SPSS software (Version 26.0). Descriptive statistics were calculated to summarize demographic characteristics and baseline compliance behaviors, while normality was assessed using skewness and the Shapiro-Wilk test. Because the variables were categorical and ordinal, non-parametric tests were applied: Pearson's Chi-Square test (or Fisher's Exact Test for small cell counts) and the Kruskal-Wallis H test were used to examine associations between socio-demographic factors and compliance behaviors at a significance level of $p < 0.05$.

RESULTS

The study analyzed data from 506 validated respondents to evaluate public adherence to health protocols during the pandemic transition period in Indonesia. The empirical findings are presented objectively across three core domains: baseline socio-demographic characteristics, workplace and environmental preparedness, and bivariate inferential associations between demographic variables and compliance behaviors.

Table 1 Frequency distribution of respondent demographic characteristics (n=506)

Characteristics	Frequency (f)	Percentage (%)
Gender		
Male	144	28.5
Female	362	71.5
Age		
15-19	40	7.9
20-24	70	13.8
25-29	51	10.1
30-34	97	19.2
35-39	69	13.6
40-44	74	14.6
45-49	47	9.3
50-54	41	8.1

Characteristics	Frequency (f)	Percentage (%)
55-59	14	2.8
60 and over	3	0.6
Educational background		
High school	74	14.6
Diploma 1	3	0.6
Diploma 3	153	30.2
Diploma 4/ Stratum I	177	35.0
Stratum II/Master	85	16.8
Stratum III/Doctorate	14	2.8

Table 1 summarizes the socio-demographic profile of the sample (n=506). The respondent population was predominantly female (71.5%) and heavily represented by individuals in the economically productive 30–34 age group (19.2%). Regarding educational attainment, the largest proportion of respondents held a Bachelor's degree or Diploma 4 equivalent (35.0%), followed by Diploma 3 graduates (30.2%).

Table 2 Frequency distribution of occupational profiles and work modalities (n=506)

Variable	Frequency (f)	Percentage (%)
Occupation		
. Private company/cooperative/foundation employees	176	34.8
. Civil servants/army/police officers	192	37.9
. Entrepreneurs	138	27.3
Employment Sector		
. Government	238	47.0
. Individual or independent	102	20.2
. Private	166	32.8
Position qualification level		
. Undefined	131	25.9
. Operators/implementers	232	45.8
. Lower management (equivalent to echelon 4b to 4a)	46	9.1
. Middle management (equivalent to echelon 3b to 2b)	77	15.2
. Top management (equivalent to echelon 2a to 1a)	20	4.0
Work Modality		
. Work from home	95	18.8
. Work from home or work in the office (in turns)	109	21.5
. Work in the office	302	59.7
Division of work time (last 2 weeks)		
. Work in shifts	211	41.7
. Without shift arrangements	295	58.3
Business Fields		
. Administration, government, defense, and social security	5	1.0
. Water supply, waste management, and recycling	1	0.2
. Electricity and gas supply	3	0.6
. Accommodation and food & drink provision	6	1.2
. Wholesale and retail trade, car repair and maintenance	2	0.4
. Mining and quarrying	2	0.4
. Agriculture, forestry, and fisheries	8	1.6
. Transportation and warehousing	4	0.8
. Processing industry	5	1.0
. Information and communication	3	0.6
. Health services and social activities	244	48.2
. Financial and insurance		

Variable	Frequency (f)	Percentage (%)
. Educational	4	0.8
. Corporate services	81	16.0
. Construction and real estate	2	0.4
. Other services	4	0.8
	132	26.1
Work Location (Province)		
. DKI Jakarta and Java	185	36.6
. Banten & Sumatra	175	34.6
. Bali & Nusa Tenggara	50	9.9
. Kalimantan	24	4.7
. Sulawesi	30	5.9
. Others (Papua)	42	8.3

Table 2 presents the occupational distribution of the respondents. Public sector employees (civil servants, military personnel, and police officers) represented the largest employment category (37.9%), with the majority functioning as operators or implementers (45.8%). Most participants operated from physical office environments (59.7%) under non-shift arrangements (58.3%). The healthcare and social services sector represented the primary business field (48.2%), and DKI Jakarta and Java was the most heavily represented geographic region (36.5%).

Table 3 Frequency distribution of respondents' workplace behavior during the pandemic (n=506)

Variable	Frequency (f)	Percentage (%)
Frequency of body temperature measurements in a day while at work		
None	127	25.1
1 time	235	46.4
2 times	86	17.0
3 times or more	58	11.5
Use of masks during work		
<50% of the working time	24	4.7
50-74% of the working time	30	5.9
75-99% of the working time	108	21.3
100% of the working time	344	68.0
Average distance to colleagues/customers while at work		
Less than 1 meter	172	34.0
2 meters	286	56.5
3 meters or more	48	9.5
Frequency of washing hands with soap/hand sanitizer during work hours		
Never	4	0.8
1 to 2 times	53	10.5
3 to 4 times	151	29.8
More than 5 times	298	58.9

Table 3 reports baseline adherence to health protocols in the workplace. Among the surveyed population, 46.4% underwent a single daily temperature check, 68.0% maintained mask utilization throughout 100% of their working hours, 56.5% maintained an interpersonal

physical distance of 2 meters, and 58.9% washed or sanitized their hands five or more times per work shift.

Table 4 Frequency distribution of behavioral compliance with daily health protocols during the pandemic transition period (n = 506)

Variable	Frequency (f)	Percentage (%)
Keeping up with the latest information about COVID-19		
Never	10	2.0
Rarely	28	5.5
Sometimes	150	29.6
Often	150	29.6
Always	168	33.2
Using a mask in daily activities		
Never	3	0.6
Rarely	6	1.2
Sometimes	29	5.7
Often	91	18.0
Always	377	74.5
Observing social distancing and physical distancing		
Never	2	0.4
Rarely	11	2.2
Sometimes	92	18.2
Often	195	38.5
Always	206	40.7

Table 4 details general daily behavioral practices outside of the workplace. In daily routines, 74.5% of respondents reported always wearing a mask, 40.7% reported always practicing physical distancing, and 33.2% consistently monitored emerging information regarding COVID-19.

Table 5 Frequency distribution of occupational and environmental preparedness during the pandemic transition period

Variable	Frequency (f)	Percentage (%)
Health protocols are applicable in the workplace		
Yes	499	98.6
No	7	1.4
Health insurance is available in the workplace		
Yes	407	80.4
No	99	19.6
In the last 4 weeks, disinfectants have been used in the workplace		
Yes	347	68.6
No	159	31.4
Hand sanitizer is available in the workplace		
Not available	15	3.0
Less available	12	2.4
Sufficiently available	47	9.3
Available	251	49.6
Highly available	181	35.8
Sink and hand soap are available in the workplace		
Not available	9	1.8
Less available	12	2.4
Sufficiently available	37	7.3

Variable	Frequency (f)	Percentage (%)
Available	282	55.7
Highly available	166	32.8

Table 5 presents environmental preparedness indicators across respondents' workplaces. A total of 98.6% of workplaces enforced health protocols, 80.4% provided health insurance coverage, and 68.6% executed routine disinfectant spraying within the preceding four weeks. Furthermore, 85.4% of respondents reported sufficient to high availability of hand sanitizer, while 88.5% reported adequate access to handwashing sinks and soap.

Table 6 Correlation between Education Level and Compliance Levels of COVID-19 Health Guidelines

COVID-19 Health Protocol Compliance Behavior	Education (Frequency/Percentage)						p-value*
	High School	Diploma 1	Diploma 3	Bachelor	Master	Doctor	
Measurement of body temperature (in a day)							
None	20	2 (66.7)	46 (30.1)	43 (24.3)	15	1 (7.1)	0.067
1 time	(27.0)	0 (0.0)	63 (41.2)	87 (49.2)	(17.6)	9 (64.3)	
2 times	27	0 (0.0)	24	27 (15.3)	49	4 (28.6)	
3 times or more	(36.5)	1 (33.3)	(15.7)	20 (11.3)	(57.6)	0 (0.0)	
	19		20		12		
	(25.7)		(13.1)		(14.1)		
	8 (10.8)				9 (10.6)		
Use of masks							
<50% when working with masks	5 (6.8)	0 (0.0)	7 (4.6)	10 (5.6)	1 (1.2)	1 (7.1)	0.236
50%-74% when working with masks	6 (8.1)	0 (0.0)	4 (2.6)	13 (7.3)	7 (8.2)	0 (0.0)	
75%-99% when working with masks	18	0 (0.0)	29 (19.0)	31 (17.5)	25	5 (35.7)	
	(24.3)				(29.4)		
100% when working with masks	45	3 (100.0)	113(73.9)	123	52	8 (57.1)	
	(60.8)			(69.5)	(61.2)		
Handwashing/ use of hand sanitizers	1 (1.4)	0 (0.0)	2 (1.3)	0 (0.0)	1 (1.2)	0 (0.0)	0.001
None	15	0 (0.0)	11 (7.2)	12 (6.8)	11	4 (28.6)	
1-2 times	(20.3)	0 (0.0)	43 (28.1)	43 (24.3)	(12.9)	6 (42.9)	
3-4 times	29	3 (100.0)	97 (63.4)	122(68.9)	30	4 (28.6)	
5 times or more	(39.2)				(35.3)		
	29				43		
	(39.2)				(50.6)		
Social distancing	21	0 (0.0)	66 (43.1)	68 (38.4)	15	2 (14.3)	<0.001
<1 meter	(28.4)	1 (33.3)	80 (52.3)	95 (53.7)	(17.6)	10	
1-2 meters	44	2 (66.7)	7 (4.6)	14 (7.9)	56	(71.4)	
3 meters or more	(59.5)				(65.9)	2 (14.3)	

COVID-19 Health Protocol Compliance Behavior	Education (Frequency/Percentage)						<i>p-value*</i>
	High School	Diploma 1	Diploma 3	Bachelor	Master	Doctor	
	9 (12.2)				14 (16.5)		

Table 6 revealed that self-directed health behaviors were significantly associated with educational level. Specifically, higher educational attainment was strongly correlated with increased hand hygiene frequency ($p = 0.001$), with the majority of respondents holding Bachelor's (68.9%) and Diploma 3 degrees (63.4%) reporting handwashing or sanitizing five or more times daily. Similarly, physical distancing practices demonstrated a highly significant association with educational background ($p < 0.001$), as higher proportions of respondents across post-secondary educational strata consistently maintained a spatial boundary of 1–2 meters or more. In contrast, mandatory entry-level administrative measures showed no statistically significant relationship with education level, including daily body temperature screening ($p = 0.067$) and workplace mask utilization ($p = 0.236$), indicating that institutional screening requirements operated uniformly regardless of individual educational attainment.

Table 7 Correlation Between Occupation and Compliance Levels with COVID-19 Health Guidelines

COVID-19 Health Protocol Compliance Behavior	Occupation (Frequency/Percentage)			<i>p-value*</i>
	Private company/cooperative/ foundation employees	Civil servants/ army/police officers	Entrepreneurs	
Measurement of body temperature (in a day)	27 (15.3)	52 (27.1)	48 (34.8)	0.001
None	95 (54.0)	95 (49.5)	45 (32.6)	
1 time	32 (18.2)	29 (15.1)	25 (18.1)	
2 times	22 (12.5)	16 (8.3)	20 (14.5)	
3 times or more				
Use of masks				<0.001
<50% when working with masks	5 (2.8)	2 (1.0)	17 (12.3)	
50%-74% when working with masks	9 (5.1)	3 (1.6)	18 (13.0)	
75%-99% when working with masks	30 (17.0)	48 (25.0)	30 (21.7)	
100% when working with masks	132 (75.0)	139 (72.4)	73 (52.9)	
Handwashing/ use of hand sanitizers				<0.001
None	1 (0.6)	1 (0.5)	2 (1.4)	
1-2 times	14 (8.0)	15 (7.8)	24 (17.4)	
3-4 times	55 (31.3)	42 (21.9)	54 (39.1)	
5 times or more	106 (60.2)	134 (69.8)	58 (42.0)	
Social distancing				
<1 meter	48 (27.3)	74 (38.5)	50 (36.2)	

COVID-19 Health Protocol Compliance Behavior	Occupation (Frequency/Percentage)			<i>p</i> - value*
	Private company/ cooperative/ foundation employees	Civil servants/ army/police officers	Entrepreneurs	
1-2 meters	109 (61.9)	103 (53.6)	74 (53.6)	0.195
3 meters or more	19 (10.8)	15 (7.8)	14 (10.1)	

The inferential results in table 7 demonstrate that occupation strongly governed compliance with institutionally monitored protocols. Formal sector personnel, comprising civil servants/military/police officers and private corporate employees exhibited significantly higher rates of compliance compared to self-employed entrepreneurs across three core operational metrics: daily body temperature measurements ($p = 0.001$), workplace mask utilization ($p < 0.001$), and hand hygiene frequency ($p < 0.001$). Notably, 75.0% of private sector employees and 72.4% of public sector personnel maintained mask usage throughout 100% of their working hours, compared to only 52.9% among entrepreneurs. Conversely, interpersonal physical distancing revealed no statistically significant variation across occupational categories ($p = 0.195$), suggesting that minimum spatial distancing norms (1–2 meters) were maintained at comparable rates across different work environments.

DISCUSSION

The empirical findings of this study demonstrate that public health protocol adherence during Indonesia's pandemic transition operates through a dual-mechanism model: cognition-driven adherence, guided by educational background, and institutionally enforced compliance, governed by occupational structures. When contextualized within socio-behavioral frameworks and empirical evidence indexed in leading international databases, these results offer critical insights into how individual cognitive agency and external structural controls dictate non-pharmaceutical intervention (NPI) compliance during epidemic transition phases (Djalante et al., 2020; Glaubitz & Fu, 2024; J. Wang et al., 2025).

The statistically significant correlation between educational attainment and self-regulated protective behaviors, specifically handwashing frequency ($p = 0.001$) and physical distancing ($p < 0.001$), strongly corroborates the conceptualization of health literacy (Tian et al., 2025). Through the theoretical lens of the Health Belief Model (HBM), higher education equips individuals with the critical health literacy required to accurately process complex epidemiological threat appraisals, internalize personal susceptibility, and evaluate the perceived benefits of sustained preventive measures (Clark et al., 2020; Kam & Lee, 2024; Nguyen et al., 2020).

Consequently, individuals with advanced education transform abstract public health guidelines into self-directed, habituated preventive behaviors that persist even in the absence of institutional surveillance. This finding directly mirrors global empirical evidence reported by Jay et al. (2020) and Ning et al. (2020), who observed that individual cognitive empowerment serves as the primary engine for voluntary NPI adherence in decentralized public domains (Bavel et al., 2020; L. Ning et al., 2020; Y. Ning et al., 2020; Pavic et al., 2024). Intriguingly, however, educational level did not significantly predict daily workplace temperature screenings ($p = 0.067$) or mask utilization ($p = 0.236$). This result diverges from observations in high-income Western contexts, where voluntary mask compliance was often polarized along educational and socio-political spectrums (Clark et al., 2020; Jay et al., 2020; Pavic et al., 2024).

In the Indonesian setting, universal administrative mandates effectively rendered entry-level thermal checks compulsory across public and commercial facilities, thereby standardizing adherence regardless of an individual's personal cognitive agency or educational attainment (Ladiwala et al., 2021; Rikhotso, 2026). Conversely, compliance with workplace-regulated protocols, such as body temperature checks ($p = 0.001$), mask wearing ($p < 0.001$), and routine hand hygiene ($p < 0.001$) was heavily governed by occupational status. Personnel operating in formal sectors (civil servants, military, police, and corporate employees) exhibited significantly higher adherence than self-employed entrepreneurs. Interpreted through Icek Ajzen's Theory of Planned Behavior (TPB), formal organizational environments exert strong subjective norms and elevate perceived behavioral control through institutional gatekeeping, routine administrative audits, and mandatory Standard Operating Procedures (SOPs). This systematic institutional oversight enforces behavioral compliance irrespective of an individual's personal health beliefs. These empirical findings closely align with Scopus-indexed studies in South Asia which established that structured employment settings systematically minimize behavioral drop-offs compared to decentralized informal work environments (Ladiwala et al., 2021; Song & Zhao, 2024).

Notably, interpersonal physical distancing showed no significant variation across occupational categories ($p = 0.195$), demonstrating that basic spatial boundary norms (1–2 meters) were successfully assimilated as a universal baseline for risk mitigation across diverse economic sectors. This contrasts with international evidence from developing economies, where high-density informal occupations completely compromised physical distancing capability (Perra, 2021; Zhu et al., 2022). These empirical insights carry significant practical implications for public health governance while highlighting important methodological

limitations. Because informal laborers and independent entrepreneurs operate outside institutional gatekeeping, public health authorities must deploy an evidence-based, dual-track intervention strategy: maintaining rigorous environmental readiness and administrative controls in formal organizations while shifting informal sector strategies toward community-driven, socio-culturally tailored health risk communications alongside economic subsidies for protective gear (such as surgical-grade masks) (Djalante et al., 2020; Rikhotso, 2026).

Regarding study limitations, the reliance on a digital convenience sampling strategy via Google Forms restricted participation to individuals with internet access and digital literacy, yielding a sample heavily weighted toward tertiary-educated respondents (84.8% holding a Diploma 3 or higher) and healthcare personnel (48.2%) (Hinojosa-Nogueira et al., 2026; Iida et al., 2021; Li et al., 2025). Furthermore, the reliance on self-reported compliance metrics introduces potential social desirability bias, which may overestimate actual behavioral adherence compared to direct observational field audits. Finally, the cross-sectional design captures compliance at a single point during the pandemic transition phase, precluding direct causal inferences regarding the longitudinal trajectory of health behaviors as global epidemic conditions evolve (Ithnain et al., 2024; Sibiya et al., 2023; C. Wang et al., 2020).

CONCLUSION

This study shows that public health compliance during epidemic transitions works through two main mechanisms: cognitive adherence and institutional enforcement. Higher educational attainment improves internal health literacy, which drives self-regulated practices like hand hygiene and physical distancing. In contrast, formal workplace structures enforce mandatory behaviors such as mask wearing and temperature checks, through supervisory oversight. For public health governance in developing economies, formal sectors should maintain strict administrative controls, whereas informal sectors require targeted educational outreach, culturally tailored communication, and resource subsidies. Overall, building long-term pandemic resilience requires combining institutional mandates with individual health literacy to protect public health in future crises.

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