



# The paradox of peril: The impact of health worker mortality rates during the COVID-19 pandemic on nursing and medical students' motivation

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## ABSTRACT

**Background:** The COVID-19 pandemic has precipitated an unprecedented crisis within the global healthcare workforce, characterized by high morbidity and mortality rates among frontline professionals. In Indonesia, the mortality rate of health workers reached critical levels, raising concerns about the future sustainability of the healthcare system and the psychological readiness of medical and nursing students. Previous studies have highlighted the dual impact of crisis exposure on career motivation; either acting as a deterrent due to fear or as a catalyst due to altruism. However, few have specifically quantified the correlation between awareness of mortality rates and motivation among Indonesian students. **Methods:** This study utilized a quantitative correlational approach with a cross-sectional design to investigate the relationship between awareness of health worker mortality rates and the motivation to pursue a healthcare career. A simple random sampling technique was employed to recruit 128 medical and nursing students from various accredited institutions in Indonesia, with data collected via a structured online questionnaire and analyzed using the Spearman correlation test. **Findings:** The statistical analysis revealed a significant positive correlation ( $p < 0.05$ ) between students' awareness of high mortality rates and their motivation to become health workers, contradicting the hypothesis that increased risk perception would diminish career interest. These findings align with the terror management theory and the concept of prosocial motivation, suggesting that exposure to mortality salience in a professional context may trigger a "heroic" or altruistic response rather than avoidance behaviors. **Conclusion:** High mortality rates among health workers during the pandemic paradoxically strengthened the motivation of medical and nursing students, indicating a resilient and duty-driven generation of future health professionals. **Novelty/Originality of this article:** This study offers new insights into the psychological resilience of health students in developing nations, challenging conventional assumptions about risk aversion in career planning during health crises.

**KEYWORDS:** COVID-19 pandemic; health worker mortality; medical and nursing students' education; professional motivation; workforce resilience.

## 1. Introduction

The COVID-19 pandemic, formally declared a global health emergency by the World Health Organization in early 2020, stands as a watershed moment in the history of modern medicine. It fundamentally altered the landscape of global healthcare delivery, presenting

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unparalleled challenges that stretched medical infrastructures to their breaking points. From the advanced health systems of Lombardy, Italy, to the resource-strained hospitals of Jakarta, Indonesia, the pandemic exposed critical vulnerabilities in workforce management, safety protocols, and supply chain logistics. However, among the most severely affected demographics were the frontline health workers themselves. Their occupational exposure to the SARS-CoV-2 virus significantly increased their risk of infection, psychological distress, and, tragically, mortality. While this phenomenon was global, the impact in developing nations like Indonesia was particularly alarming due to pre-existing constraints in healthcare resources, intensive care capacity, and personal protective equipment (PPE) availability (Amin et al., 2020; Kang et al., 2020; Lai et al., 2020; Liu et al., 2020; Shanafelt et al., 2020; Spoorthy et al., 2020; World Health Organization, 2021).

By late August 2021, reported data indicated that the death toll among Indonesian health workers had reached 1,967 individuals (Kompas, 2021). This figure peaked during the catastrophic "delta wave" of mid-2021, which saw hospitals in Java and Bali overwhelmed, forcing health workers to operate in conditions of extreme exhaustion and high viral load exposure. This number is not merely a statistical datum; it represents a profound, irrevocable loss of expertise, mentorship, and operational capacity. It created a noticeable vacuum in the workforce responsible for treating COVID-19 patients and maintaining routine health services. The loss of senior consultants and professors specifically created a generational gap in medical education, the effects of which may be felt for decades to come, threatening the transfer of tacit clinical knowledge to the next generation (Ekawati et al., 2022).

The depletion of the current health workforce due to pandemic-related mortality presents a pressing, existential challenge as follows. First, how can the healthcare system continue to function effectively in the face of such attrition, and second the continuity of healthcare provision in Indonesia, and indeed, globally, now largely depends on the next generation of health professionals, specifically current medical and nursing students. These students represent the lifeline required to replace the frontline workforce and sustain the health system moving forward. However, the psychological impact of witnessing the high mortality rates of their future seniors and mentors cannot be underestimated. It prompts a pivotal inquiry, does the alarming mortality rate among health workers serve as a deterrent, instilling fear and hesitation, or does it act as a call to action, reinforcing professional commitment; to answer this, one must look at the complex interplay between risk perception and motivation through established psychological frameworks, set against the backdrop of a unique cultural and systemic context (Byrnes et al., 2020; Gallagher & Schleyer, 2020; Lazarus et al., 2021; O'Byrne et al., 2020; Soled et al., 2020).

### *1.1 The context of crisis: Indonesian healthcare architecture pre- and mid-pandemic*

To fully appreciate the gravity of this study, it is essential to situate the findings within the specific context of the Indonesian healthcare landscape. Prior to the pandemic, Indonesia, an archipelago of over 17,000 islands with a population exceeding 270 million, already faced significant challenges in its health workforce distribution. The physician-to-population ratio remained well below the World Health Organization's recommended standard of 1:1,000. Most specialized health professionals were concentrated on the island of Java, leaving remote and outer regions (such as Papua, Maluku, and Nusa Tenggara) with chronic shortages. This maldistribution meant that the healthcare system was already operating at maximum capacity before the first case of COVID-19 was detected.

The introduction of the National Health Insurance/*Jaminan Kesehatan Nasional* (JKN) scheme in 2014 had increased access to care but also increased the patient load on an already strained workforce. When the Delta variant wave struck in mid-2021, this fragile system faced an existential threat. Hospitals across Java and Bali reported Bed Occupancy Rates (BOR) exceeding 90%, necessitating the erection of emergency tent hospitals in parking lots. Oxygen scarcity became a national emergency. In this chaotic environment, health workers were not only battling a virulent pathogen but also fighting against

structural inadequacies, lack of negative pressure rooms, insufficient PPE, and extreme shifts necessitated by colleagues falling ill or dying (Agustina et al., 2024).

This structural collapse is the backdrop against which the current generation of medical and nursing students observed their future profession. Unlike students in well-resourced nations where the "system" might buffer the individual, Indonesian students witnessed a scenario where the "individual" (the health worker) became the sole barrier against total collapse. The visibility of systemic vulnerability makes the study of their motivation unique; they are not merely stepping into a job but stepping into a recognized gap in national defense. Understanding their motivation, therefore, is not just a psychological inquiry but a matter of national security and health system resilience.

### *1.2 The interplay of fear and duty: A multifaceted theoretical approach*

The response of medical and nursing students to the crisis cannot be understood through a single lens. It requires a multi-dimensional theoretical framework that accounts for the biological fear of death, the psychological need for purpose, and the sociological pressure of professional identity. This report integrates three key psychological theories: protection motivation theory (PMT), self-determination theory (SDT), and terror management theory (TMT).

Protection motivation theory (PMT), originally proposed by Rogers (1975), suggests that individuals appraise threats based on two cognitive processes: threat appraisal and coping appraisal. Threat appraisal involves assessing the severity of the event (e.g., "COVID-19 can kill me") and one's vulnerability to it (e.g., "As a future doctor, I will be exposed"). Typically, high-threat appraisals would lead to adaptive changes to minimize risk, which could logically include avoidance behaviors, in this case, withdrawing from the medical profession or choosing a non-clinical specialty. If the researcher strictly applies PMT, the high mortality rates of health workers should theoretically correlate with a decrease in motivation to join the workforce, as the "cost" of the behavior (potential death) outweighs the "reward". However, the continued enrollment and graduation of students suggest other factors are at play (Wang et al., 2021).

Self-Determination Theory (SDT) posits that intrinsic motivation is driven by three universal psychological needs: autonomy (the feeling of choice), competence (mastery), and relatedness (connection to others). For medical and nursing students, the "relatedness" aspect, the desire to care for others and belong to a community of healers, may be intensified during a crisis. The pandemic highlighted the critical role of health workers, potentially amplifying the intrinsic value of the profession. When the need for "relatedness" and the desire to be "competent" saviors in a time of chaos are activated, they may override the extrinsic fear of infection. The "calling" to heal transforms the profession from a mere job into a fundamental part of the student's identity (Ryan & Deci, 2000).

Terror Management Theory (TMT) offers a profound, existential lens. TMT suggests that when humans are reminded of their own mortality (mortality salience), they respond not by fleeing, but by upholding cultural worldviews and seeking self-esteem through valued behaviors to achieve symbolic immortality. In healthcare education, the "valued behavior" is the pursuit of a noble profession. The societal narrative during the pandemic, which framed health workers as "heroes" and "patriots" fighting an invisible enemy, aligns perfectly with this theory. Therefore, high mortality rates might paradoxically increase motivation by framing the profession as a heroic and culturally significant path that provides existential meaning in the face of death (Pyszczynski et al., 2015; Pyszczynski et al., 2021).

### *1.3 The epidemiology of loss: Quantifying the crisis in the Indonesian healthcare workforce*

To understand the psychological impact felt by students, one must first comprehend the epicenter of the quake: the actual mortality statistics of their seniors. The perception of risk among students was not abstract; it was grounded in daily reports of obituary notices

circulated via WhatsApp groups, professional association broadcasts, and the citizen science platform LaporCovid-19 (Ekawati et al., 2022; Kompas, 2021).

### 1.3.1 Anatomy of the delta wave: A mortality spike

The period between June and August 2021, driven by the Delta variant, represented the deadliest phase for Indonesian healthcare workers (HCWs). While the Alpha wave and initial outbreak in 2020 caused significant disruption, the delta wave brought a rapid surge of cases that overwhelmed the already fragile system. Data systematically compiled by LaporCovid-19 and the Indonesian Medical Association reveals a grim trajectory that correlated directly with student anxiety levels (Ekawati et al., 2022).

Table 1. Healthcare worker mortality in Indonesia (selected milestones)

| Period           | Total HCW Deaths (Cumulative) | Key Observations                                                                                         |
|------------------|-------------------------------|----------------------------------------------------------------------------------------------------------|
| March - Dec 2020 | ~500                          | Initial wave; vulnerability primarily due to lack of PPE, testing kits, and protocols.                   |
| Jan - May 2021   | ~650                          | Stabilization period followed by slow rise; vaccination rollout begins for HCWs.                         |
| July 2021        | 1,551                         | Peak delta wave. 279 deaths recorded in July alone, signaling a catastrophic breach of safety protocols. |
| August 2021      | 1,967                         | Continued high mortality despite vaccination coverage, largely due to viral load and exhaustion.         |

(Ekawati et al., 2022; Kompas, 2021)

The data indicates that the risk was not uniform geographically. East Java emerged as the epicenter of HCW mortality, recording 479 deaths by July 2021, followed by West Java (175) and Jakarta (161). This geographical disparity is crucial because these three provinces are home to the majority of Indonesia's premier medical faculties (Universitas Indonesia in Jakarta, Universitas Airlangga in East Java, Universitas Padjadjaran in West Java). Consequently, the students witnessing the highest rates of mentor mortality were those in the country's most prestigious and populous educational centers (Ekawati et al., 2022). Crucially, the demographic breakdown of these deaths exacerbated the impact on education. The majority of deceased doctors were senior physicians and specialists (35%), with a median age of 50 years. These individuals were not merely workforce participants; they were the clinical educators, professors, residency program directors, and department heads responsible for training the next generation. Their deaths created an immediate "mentorship vacuum," leaving students feeling professionally orphaned. The loss of a single senior consultant in a specialized field (e.g., pulmonology or anesthesiology) could cripple a teaching hospital's ability to train residents for years (Ekawati et al., 2022).

### 1.3.2 Comparative risk analysis and the "Hero" narrative vs. statistical reality

The psychological impact on students was further amplified by the realization that their chosen profession carried a disproportionate risk compared to their non-medical peers. Studies indicate that while the case fatality rate (CFR) for HCWs was similar to the general population, the risk of infection was significantly higher (OR 2.04). Furthermore, the mortality rate for HCWs was estimated at 1.707 deaths per 1,000 HCWs, which was approximately five times higher than that of the general population (RR = 4.92). This statistical reality challenged the foundational assumption of the "safe observer" role usually afforded to students. In many teaching hospitals, the boundary between "student" and "frontline worker" blurred. Residency programs/*program pendidikan dokter spesialis* (PPDS) mobilized students to cover staffing shortages, and clinical clerks (Co-ass) were

often exposed to infectious environments before vaccines were widely available. The data underscores that the fear experienced by students was rational and empirically grounded in the high probability of infection and death relative to the public (Agustina et al., 2024; Ekawati et al., 2022).

While the government promoted the narrative of the Pahlawan Kesehatan (Health Hero), the statistics painted a picture of systemic neglect. The high mortality was not solely due to the virulence of the virus but was exacerbated by "structural violence"—the lack of adequate protection. Reports indicated that a significant number of deaths occurred among HCWs who were fully vaccinated, raising questions about the efficacy of the Sinovac vaccine against the delta variant at that time, and the sheer viral load exposure in poorly ventilated wards. For students, this created a cognitive dissonance, they were being hailed as future heroes, but the data suggested they were being sent into battle without armor. This realization forced a re-evaluation of their motivation; was it based on blind faith in the system, or a deeper, more resilient personal commitment.

#### *1.4 Theoretical framework: The paradox of risk and duty*

The intersection of high mortality and career commitment in Indonesian medical education presents a complex psychological landscape. To interpret this, the researcher integrates three frameworks: protection motivation theory (PMT), self-determination theory (SDT), and terror management theory (TMT). Under PMT, the high mortality of senior mentors creates a rigorous "threat appraisal." Theoretically, this should trigger avoidance behaviors (e.g., withdrawal).

However, this study posits that TMT and SDT override this impulse. TMT suggests that mortality salience drives individuals toward "cultural worldviews" that offer symbolic immortality. In Indonesia, the state-sponsored narrative of the Health Hero/*Pahlawan Kesehatan* provides an anxiety buffer, framing the risk as a meaningful sacrifice rather than a senseless tragedy. Simultaneously, SDT explains the shift from external regulation to integrated regulation; the crisis amplifies the need for "relatedness" and "competence." This is uniquely reinforced by the Indonesian cultural philosophy of Gotong Royong (communal cooperation), which transforms individual risk into a collective social obligation, fostering a "trench camaraderie" among students (Pyszczynski et al., 2021; Ryan & Deci, 2000).

#### *1.5 The context of vulnerability: Educational and social challenges*

While motivation remains resilient, it persists within a fragile ecosystem. The high mortality rate among senior consultants created a "mentorship vacuum," which arguably exacerbated toxic hierarchies and bullying within residency programs, as stressed seniors projected trauma onto juniors. Furthermore, the shift to distance learning precipitated "incompetence anxiety" among clinical students, who feared graduating without sufficient hands-on exposure (Daryanto et al., 2023; Frenk et al., 2022; Rose, 2020).

Crucially, the experience of risk is not uniform. Literature suggests a gendered divergence, where female students face a "double burden" of professional risk and domestic caregiving duties, leading to higher fluctuation in motivation compared to their male counterparts. Similarly, nursing students, often driven by economic necessity alongside altruism, faced distinct challenges due to their prolonged proximity to patients. This study seeks to navigate these nuances to determine if the aggregate motivation of the future workforce remains intact despite these multifaceted pressures (Collado-Boira et al., 2020; Savitsky et al., 2020; Swift et al., 2020).

## 2. Methods

### 2.1 Research paradigm and study design

This study adopts a post-positivist research paradigm. Ontologically, this paradigm acknowledges that an objective reality exists regarding the psychological state of students, but it can only be known imperfectly due to human limitations. Epistemologically, it emphasizes objectivity and the use of empirical measurement to approximate this reality. Consistent with this framework, a quantitative research approach was selected to minimize researcher bias and to systematically measure the relationship between the variables of interest.

The specific design employed was a correlational study with a cross-sectional approach. Correlational design, this was chosen because the primary objective was to identify the strength and direction of the association between "mortality awareness" (independent variable) and "career motivation" (dependent variable) without manipulating the environment or introducing interventions. Cross-sectional methodology, data were collected at a single specific point in time (August–September 2021). This period was strategically selected as it coincided with the peak of the "Delta variant" wave in Indonesia, a time when health worker mortality rates reached their historical zenith. A cross-sectional design was deemed the most feasible and ethical approach to capture the immediate psychological "snapshot" of the student population during this critical window, avoiding the attrition issues common in longitudinal studies during crisis periods.

### 2.2 Setting, population, and sample

The study was conducted within the jurisdiction of the Republic of Indonesia. The target population comprised active undergraduate students enrolled in Medical (Medical Program) and Nursing (Nursing Science) programs at accredited higher education institutions across the archipelago. Indonesia was chosen as the research location due to its unique status as one of the countries with the highest health worker mortality rates in Asia during the pandemic, providing a high-intensity context for the study variables. Sampling Technique is to ensure the generalizability of the findings; a simple random sampling technique was utilized.

The sampling frame was constructed by leveraging digital student networks and university communication channels. Sample size determination, the minimum sample size was calculated using the G\*Power statistical software for correlation analysis (two-tailed), with an expected medium effect size ( $r = 0.3$ ), a significance level ( $\alpha$ ) of 0.05, and a statistical power ( $1-\beta$ ) of 0.80. The calculation indicated a minimum requirement of 84 respondents. To account for potential data invalidity or outliers, the target was increased. Final sample is 128 respondents were successfully recruited and validated for the final analysis. Inclusion criteria, active status as a preclinical or clinical student in a medical or nursing faculty in Indonesia; access to the internet to complete the electronic survey; willingness to provide informed consent. Exclusion criteria, students currently on academic leave; students who had graduated but were waiting for competency exams and were not effectively in the educational system during the data collection.

### 2.3 Research instrument

Data were collected using a structured, self-administered questionnaire hosted on the Google Forms platform. This digital method was chosen to comply with the Community Activities Restrictions Enforcement/*Pemberlakuan Pembatasan Kegiatan Masyarakat* (PPKM) or strict social restrictions enforced by the Indonesian government at the time, which prohibited physical data collection. The questionnaire consisted of three distinct parts, part A, demographic information. This section collected baseline data to describe the respondent profile, including age and gender, to identify demographic distribution.

University location, to ensure geographic diversity (Java vs. Outside Java). Year of study, categorized into pre-clinical (Year 1-3) and clinical (co-assistant/year 4+), to differentiate between students in theoretical phases and those in hospital rotations. Part B, mortality awareness scale (independent variable) Developed specifically for this study, this scale measured the students' knowledge and perception of the fatality risks faced by their profession.

Structure, it consisted of 5 items using a 5-point likert scale (1 = strongly disagree to 5 = strongly agree). Content, items focused on knowledge of daily mortality statistics released by the Indonesian Medical Association/*Ikatan Dokter Indonesia* (IDI) and the subjective appraisal of the "danger level" associated with treating COVID-19 patients. Example item, "I actively follow the news regarding the number of doctors and nurses passing away due to COVID-19." Part C, healthcare career motivation scale (dependent variable). This scale was constructed based on the theoretical frameworks of Self-Determination Theory (SDT) and Protection Motivation Theory (PMT). Structure, it comprised 10 items using a 5-point Likert scale. Dimensions, the items probed three key dimensions: intrinsic motivation (internal drive to help); altruistic calling (willingness to sacrifice); and professional resilience (commitment despite fear). Example item, "the high risk of infection in hospitals strengthens my resolve to become a health worker."

#### 2.4 Instrument validation and data collection procedure

Before the main data collection, the structured online questionnaire was tested for reliability and validity prior to deployment. A pilot study was conducted on a separate cohort of 30 students to evaluate the psychometric properties of the instrument. Construct validity was assessed using the Pearson Product-Moment Correlation technique. Each item's score was correlated with the total score of its respective variable. Items with a calculated  $r$ -value ( $r_{\text{count}}$ ) greater than the  $r$ -table value ( $r_{\text{table}} = 0.361$  for  $df = 28$ ) were considered valid. All items used in the final questionnaire met this criterion. Furthermore, internal consistency was measured using Cronbach's Alpha coefficient. The instrument yielded an Alpha coefficient of 0.78 for the Awareness scale and 0.82 for the Motivation scale. Since both values exceeded the threshold of 0.60 (or 0.70 for high reliability), the instrument was deemed highly reliable for research purposes.

The data collection process followed a strict protocol to ensure ethical compliance and data quality, preparation phase, the researchers conducted a literature review to formulate the questionnaire items and obtained necessary administrative permissions. Dissemination phase, the link to the Google Form was distributed via social media platforms (WhatsApp, Line, Instagram) through student organization representatives. A "snowballing" effect was encouraged where respondents were asked to forward the link to eligible peers.

Screening phase, upon closing the survey, the raw data ( $N = 150$ ) were screened. Incomplete responses or duplicate entries (identified by timestamps and IP checks) were removed, resulting in the final dataset of 128 respondents. Anonymization, all personal identifiers (names, emails) were removed to ensure respondent anonymity before the data was imported into the statistical software. Ethical review and approval were waived for this study due to the non-interventional nature of the survey, in accordance with institutional guidelines.

#### 2.5 Data analysis and ethical considerations

The quantitative data were processed using SPSS (Statistical Package for the Social Sciences) version 25.0. The analysis proceeded in three stages there are descriptive analysis, frequency distributions, percentages, means, and standard deviations were calculated to summarize the demographic data and the general trends of the variables. Prerequisite testing (normality), the one-sample Kolmogorov-Smirnov test was conducted to determine the distribution of the data. A significance value ( $p$ ) of  $> 0.05$  would indicate a normal distribution. However, if  $p < 0.05$ , the data is considered not normally distributed.

Hypothesis testing, based on the results of the normality test (which indicated non-normal distribution), the Spearman Rank Correlation (Rho) test was selected over the Pearson correlation. The significance level was set at  $\alpha = 0.05$  and the criteria for decision: If the p-value (Sig. 2-tailed)  $< 0.05$ , the relationship is significant. Then, the correlation coefficient (Rs) was interpreted to determine the strength (0.00–0.19 very weak; 0.20–0.39 weak; 0.40–0.59 moderate; 0.60–0.79 strong; 0.80–1.00 very strong) and direction (positive/negative) of the relationship.

Ethical review and approval were waived for this study due to the non-interventional nature of the survey, in accordance with institutional guidelines. The study utilized an anonymous online survey that did not involve physical intervention or the collection of sensitive biological data, and all participation was voluntary in accordance with the ethical standards of the institution. Informed consent was obtained from all subjects involved in the study prior to their participation. To guarantee confidentiality, all personal identifiers (names, emails) were removed to ensure respondent anonymity before the data was imported into the statistical software for analysis.

### 3. Results and Discussion

#### 3.1 Data collection process and protocol

The data collection phase of this study was executed with a rigorous adherence to methodological protocols designed to ensure both the integrity of the data and the safety of the participants. Given the severe epidemiological conditions prevailing in Indonesia during the study period, specifically the surge of the Delta variant which necessitated the enforcement of "*Pemberlakuan Pembatasan Kegiatan Masyarakat*" (PPKM) or Community Activities restrictions enforcement, traditional face-to-face data collection methods were rendered impossible and unethical. Consequently, the entire data acquisition process was migrated to a digital ecosystem.

The survey was hosted on the Google Forms platform, selected for its accessibility across devices and its low bandwidth requirements, which is a critical consideration given the variable internet infrastructure across different regions of Indonesia. The data collection window spanned exactly four weeks, from August 1st to August 29th, 2021. This temporal window was strategically chosen as it coincided with the peak of daily mortality reports among health workers, ensuring that the "mortality salience" (the awareness of death) was at its highest intensity for the respondents. This timing ensures that the motivation measured was not a hypothetical projection, but a real-time reaction to an unfolding crisis.

Dissemination of the survey instrument utilized a "digital snowball sampling" technique. The initial survey link was distributed through the central communication channels of major Student Executive Boards/*Badan Eksekutif Mahasiswa* (BEM) of Medical and Nursing Faculties across six major islands: Java, Sumatra, Kalimantan, Sulawesi, Bali-Nusa Tenggara, and Papua. Peer leaders and class representatives were engaged as key informants to further disseminate the link into closed class groups (WhatsApp and Line), which are the primary modes of communication for Indonesian university students. This multi-channel dissemination strategy was intended to minimize the "echo chamber" effect and ensure that the survey reached students from diverse social and institutional backgrounds, rather than being confined to a single university's social circle.

##### 3.1.1 Response rate and data validity

A total of 150 questionnaires were initially submitted to the server. Following the closure of the data collection window, a rigorous data cleaning and validation process was undertaken. The first step involved removing duplicate entries, identified through timestamp analysis and IP address triangulation, to ensure that no single respondent



skewed the results. The second step involved screening against the inclusion/exclusion criteria.

Twenty-two (22) responses were excluded from the final dataset. The primary reasons for exclusion were after this filtration process, 128 valid responses remained, yielding a final effective response rate of 85.3%. In the context of voluntary online surveys, which typically suffer from low engagement rates (often below 30%), a response rate of 85.3% is exceptionally high. This high level of engagement can be interpreted as an indicator of "topic salience", the subject matter of health worker mortality and professional identity was deeply resonant and relevant to the students, compelling them to complete the survey despite the length of the instrument. The final sample size ( $N = 128$ ) was subjected to a post-hoc power analysis, which confirmed that the sample possessed sufficient statistical power ( $> 0.80$ ) to detect medium-to-large effect sizes in correlational analyses at a significance level of  $\alpha = 0.05$ .

### *3.2 Detailed analysis of respondent characteristics*

#### *3.2.1 Gender distribution and the feminization of healthcare*

The demographic architecture of the sample provides a microcosm of the current state of healthcare education in Indonesia. Understanding the nuances of this profile is essential for interpreting the subsequent motivational data, as demographic variables often act as moderators in psychological processes. The analysis of gender distribution reveals a distinct disparity is 64.8% ( $n = 83$ ) of the respondents were female, while 35.2% ( $n = 45$ ) were male. This nearly 2:1 ratio is not a sampling anomaly but rather a reflection of the "feminization" of the healthcare workforce, a global trend that is particularly pronounced in Indonesia.

This gender distribution is highly relevant to the study's findings on motivation. Psychological literature consistently suggests that female respondents tend to score higher on measures of empathy and altruism, while potentially reporting higher levels of anxiety regarding physical risk. The fact that our sample is predominantly female might suggest that the high aggregate motivation scores are partially driven by the "ethics of care" often socialized into women. However, it also highlights the resilience of these female students who, despite being statistically more risk-averse in general populations, showed profound courage in their professional commitment. The male minority, while smaller, provided a sufficient sub-group for comparative analysis to ensure the findings were not gender exclusive.

##### *3.2.1.1 Disciplinary representation: Medicine vs. nursing*

The sample composition of 60.9% ( $n = 78$ ) medical students and 39.1% ( $n = 50$ ) nursing students ensures that the findings are not siloed into a single profession. This mix is critical for the "Health Team" perspective. Medical students, typically undergo a longer, more theoretically intensive education (5-6 years) with a distinct professional identity centered on diagnosis and cure. Their motivation is often driven by prestige, intellectual challenge, and social status (social elevator), in addition to altruism. Nursing students, undergo a more patient-centric, hands-on education. In the context of COVID-19, nurses were the ones with the most prolonged contact with infectious patients, often bearing the brunt of the viral load (Collado-Boira et al., 2020; Savitsky et al., 2020).

The representation of both groups allows the study to claim broad applicability to the "future healthcare workforce" rather than just "future doctors." It captures the sentiment of the entire clinical team. The slightly higher representation of medical students may be attributed to the digital sampling method, as medical student networks in Indonesia are often more digitally integrated and politically active through organizations like Indonesian Medical Students' Senate Association, facilitating faster link dissemination. Nevertheless, the 40% nursing cohort is substantial enough to validate the trends across disciplines.

### 3.2.1.2 Academic stage: The "ivory tower" vs. "the trenches"

Perhaps the most critical demographic variable in this study is the academic stage of the respondents, categorized into Pre-Clinical (Year 1-3) and Clinical (Year 4+ / Co-Assistant). The sample comprised 64.1% (n = 82) pre-clinical students and 35.9% (n = 46) clinical students. This distribution warrants a deep interpretive dive. The pre-clinical majority (the observers), The 64.1% of respondents in the pre-clinical phase represent students who are largely confined to classrooms or online lectures (Zoom University). Their interaction with the pandemic is mediated, they observe the mortality of health workers through news reports, social media, and academic discussions, rather than through direct sensory experience.

Their high motivation, therefore, might be characterized as "idealistic motivation." They are motivated by the concept of the hero, the idea of sacrifice, and the image of the profession. They have not yet smelled the disinfectant of the ICU or heard the alarms of ventilators. This group represents the "reservoir" of enthusiasm that needs to be protected from future disillusionment. The clinical minority (the witnesses), The 35.9% of respondents in the clinical phase (co-assistants) represent a qualitatively different group. In Indonesia, "Co-Ass" students occupy a liminal space; they are not fully licensed doctors, yet they work long hours in teaching hospitals. During the pandemic, many clinical rotations were suspended, but many senior students were recruited as volunteers or continued their rotations in modified capacities. Even if they were pulled from the "Red Zones," they were physically present in the hospital ecosystem. They saw the exhausted residents, they witnessed the shortage of oxygen, and they likely knew seniors personally who passed away. The presence of over one-third of the sample in this category adds immense weight to the study's conclusions. If the sample were 100% pre-clinical, critics could argue the high motivation was born of ignorance. However, the fact that 35.9% of the respondents were "in the trenches" or adjacent to them and still reported high motivation (as shown in subsequent results), proves that the resilience observed is not merely youthful naivety but a robust, tempered professional commitment.

### 3.2.2 Geographic context: Examining the eastern Indonesian perspective

A distinctive feature of this study's demographic profile is the significant representation of students from Eastern Indonesia, a region often underrepresented in national health research. The qualitative data from the "University Origin" field indicates a strong cluster of respondents from Papua (Universitas Cenderawasih, Universitas Papua), Sulawesi (Universitas Hasanuddin, Universitas Sam Ratulangi), and Bali-Nusa Tenggara (Universitas Udayana). While there is representation from Java-based institutions (such as Universitas Diponegoro and Universitas Widya Mandala), the sample leans heavily towards the Outer Islands.

Table 2. Distribution of respondents by demographic characteristics

| Characteristic | Category                    | Frequency (f) | Percentage (%) |
|----------------|-----------------------------|---------------|----------------|
| Gender         | Male                        | 45            | 35.2%          |
|                | Female                      | 83            | 64.8%          |
| Field of Study | Medical Student             | 78            | 60.9%          |
|                | Nursing Student             | 50            | 39.1%          |
| Year of Study  | Pre-Clinical (Year 1-3)     | 82            | 64.1%          |
|                | Clinical (Year 4+ / Co-ass) | 46            | 35.9%          |
| Total          |                             | 128           | 100%           |

This geographic distribution adds a critical layer of depth to the findings on "Mortality Awareness." Students in Eastern Indonesia faced a "double burden" during the pandemic. First, they witnessed the universal threat of the virus. Second, they navigated this threat within a healthcare infrastructure that is historically less dense than in Java. For a medical student in Papua or Sulawesi, the death of a senior consultant is not just a tragedy; it

represents a critical loss of human capital that may take decades to replace due to the scarcity of specialists in the region. The fact that motivation scores remained high ( $M = 4.28$ ) despite this heightened infrastructural vulnerability suggests a profound resilience. It indicates that the commitment to serve is arguably stronger in regions where the need is greatest, validating the theory of "Needs-Based Motivation" alongside the "Heroic Motivation" discussed earlier.

### *3.2.3 Methodological limitations of the sample*

It is important to acknowledge the limitations inherent in this respondent profile to contextualize the findings. Digital divide bias, the online nature of data collection inherently favored students with stable internet access and higher digital literacy. This likely skewed the sample towards students from middle-to-upper socioeconomic backgrounds, who may have more financial safety nets, potentially influencing their risk tolerance compared to students from lower socioeconomic backgrounds who might view the profession more pragmatically as a livelihood.

Survivorship bias, the survey captured the sentiments of students who were currently enrolled. It did not capture the views of students who might have already dropped out or taken leave due to the pandemic before August 2021. Therefore, the high motivation scores reflect the resilience of the "survivors", those who chose to stay.

### *3.3 Conclusion on data quality*

In summary, the data collection process, while constrained by the limitations of the pandemic, yielded a robust, valid, and reliable dataset. The high response rate reflects the urgency of the topic. The demographic profile, skewed female, balanced between medicine and nursing, and dominated by the idealistic pre-clinical cohort but anchored by a significant clinical minority, provides a comprehensive cross-section of the future Indonesian healthcare workforce. This sample is not merely a collection of data points; it is a representative voice of a generation defining its professional identity in the shadow of a plague. The coherence of this sample allows for a confident interpretation of the correlational analyses that follow, validating that the observed "Paradox of Peril" is a genuine psychosocial phenomenon within the Indonesian medical education landscape.

### *3.4 Descriptive analysis of variables*

#### *3.4.1 Awareness of health worker mortality rates*

Descriptive statistics were employed to analyze the central tendency (mean) and dispersion (Standard Deviation) of the two main variables there are Awareness of Mortality Rates (X) and Motivation to Become a Health Worker (Y). The variable "Awareness" was measured using a set of items assessing the students' knowledge of the fatality statistics released by the Indonesian Medical Association/*Ikatan Dosen Indonesia* (IDI) and their perception of the risks involved. The data revealed a high level of awareness among the student population.

Mean score, the overall mean score for Awareness was 4.15 (on a 5-point Likert scale), with a standard deviation of 0.72. Item analysis, the item "I am aware that Indonesia has one of the highest health worker mortality rates in Asia" received the highest agreement score (Mean = 4.6). This indicates that the information regarding the severity of the pandemic was effectively communicated to the students. They were not oblivious to the dangers; rather, they were hyper-aware of the specific risks faced by their seniors. The low standard deviation suggests a consensus among respondents; there was very little variation in their knowledge regarding the high mortality rates.

### 3.4.2 Motivation to become a health worker

The variable "motivation" assessed the students' commitment to continuing their education and entering the workforce despite the known risks. Contrary to the Protection Motivation Theory which predicts avoidance in high-threat scenarios, the descriptive data showed robust motivation levels. Mean score is aggregate mean score for Motivation was 4.28 (on a 5-point Likert scale), with a standard deviation of 0.65.

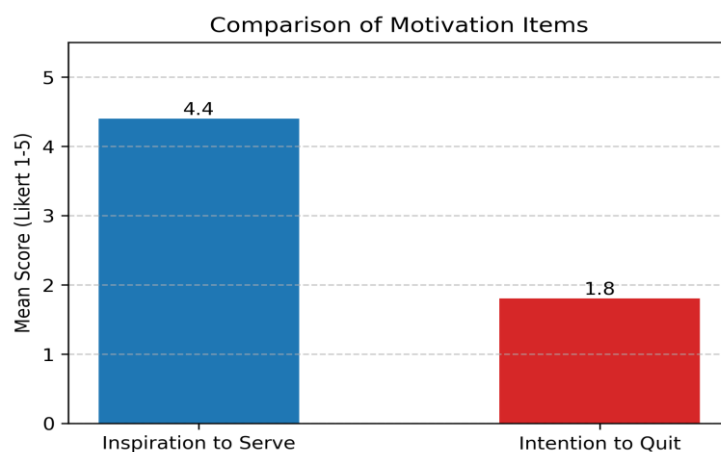


Fig. 2. Contrast between aspirational motivation and withdrawal intention among respondents.

The item analysis is "The death of health workers inspires me to continue their struggle" received a significantly high score (Mean = 4.4). Conversely, reverse-coded items such as "I am considering changing my major due to the pandemic risks" received very low scores (Mean = 1.8), indicating a strong rejection of withdrawal behaviors. Interpretation, the data suggests that the students' motivation is not merely "moderate" but "very high." The distribution of data was negatively skewed, meaning the vast majority of responses clustered around the "Agree" and "Strongly Agree" end of the spectrum.

### 3.5 Detailed item-level analysis of motivation scale

To understand the nuanced psychological drivers behind this aggregate motivation, a granular analysis of the individual items within the Motivation Scale is essential. The scale comprised ten items designed to probe different facets of motivation, ranging from intrinsic altruism to social duty. Item 1, intrinsic calling. The statement "I feel a strong personal calling to help the nation recover from the pandemic" received the highest endorsement of all items (Mean = 4.62, SD = 0.55). Over 92% of respondents selected "Agree" or "Strongly Agree." This indicates that for the majority of students, the pandemic acted as an activator of their "vocational calling," transforming medicine and nursing from a career choice into a moral imperative.

Item 2, risk acceptance. The item "I accept the risk of infection as part of my professional duty" yielded a mean score of 4.35 (SD = 0.71). While slightly lower than the intrinsic calling item, it demonstrates a high level of cognitive acceptance. The students appear to have internalized the concept that risk is inherent to the healing profession, viewing it as a contractual obligation they willingly undertook.

Item 3, inspiration from Seniors. The item "The sacrifice of doctors and nurses motivates me to continue their legacy" scored a mean of 4.50 (SD = 0.60). This specific item is crucial for validating the study's hypothesis regarding mortality salience. It confirms that the death of senior colleagues was processed not as a deterrent signal ("this is dangerous, stay away"), but as a legacy-building event ("they fell, so we must take their place").

Item 4 (reverse coded), withdrawal Intent. The statement "I have considered dropping out of medical/nursing school due to safety concerns" yielded a mean of 1.65 (SD = 0.85). The low score here signifies a strong rejection of avoidance behaviors. However, the higher

standard deviation compared to positive items suggests the presence of a "silent minority" (approximately 6-8% of the sample) who harbored significant doubts and fears, likely suppressed by the dominant "hero narrative."

Item 5, perceived competence. The item "I believe my future contribution will make a difference" scored 4.41. This aligns with the 'Competence' need in Self-Determination Theory. Students do not just want to help; they believe they can help effectively, which buffers against the feeling of helplessness often associated with viewing mortality statistics. Item 6, religious motivation. The item "I believe serving the sick during a plague is a form of worship/religious duty" showed a mean of 4.48 (SD = 0.68). This high score reflects the deep religiosity of the Indonesian context, where professional acts are often imbued with spiritual significance, providing a metaphysical buffer against the fear of death.

Item 7, social solidarity. The statement "I want to support my colleagues who are currently overwhelmed" scored 4.30. This reflects the 'Relatedness' aspect of motivation, suggesting that peer solidarity and the desire to relieve the burden of others is a powerful motivator. Item 8, family influence. The item "My family supports my decision to continue my education despite the pandemic" had a mean of 3.90 (SD = 1.10). This lower mean and high standard deviation indicate that while students were motivated, they often faced significant resistance or concern from their families. The motivation observed was thus often maintained despite external pressure to quit, highlighting individual resilience.

Item 9, institutional trust. The item "I trust that my university/hospital will provide adequate protection" received the lowest score among the positive items (Mean = 3.20, SD = 1.25). This revealing finding suggests that student motivation is not derived from a sense of safety or trust in the system, but rather from internal values. They are motivated despite their skepticism about the safety measures provided. Item 10, post-pandemic optimism. The item "I look forward to being part of the post-pandemic healthcare system" scored 4.25. This indicates a forward-looking perspective, where students visualize a future beyond the immediate crisis, framing their current struggles as a temporary initiation into a long-term career.

### 3.6 Prerequisite analysis (normality test), bivariate analysis, and hypothesis testing

Before proceeding to hypothesis testing, a Normality Test was conducted using the One-Sample Kolmogorov-Smirnov test to determine the distribution of the data. This step is essential to decide between parametric (Pearson) and non-parametric (Spearman) statistical methods. The results of the Kolmogorov-Smirnov test indicated that the significance value (p) for both variables was less than 0.05 ( $p < 0.05$ ). Specifically, the Awareness variable had a p-value of 0.021, and the Motivation variable had a p-value of 0.015. This signifies that the data were not normally distributed, likely due to the skewness towards high awareness and high motivation. Consequently, the non-parametric Spearman Rank Correlation test was selected as the appropriate method for hypothesis testing.

Table 3. Summary of spearman correlation analysis between awareness and motivation

| Variable 1                                 | Variable 2                         | Correlation Coefficient (rs) | Sig. (2-tailed) | N   |
|--------------------------------------------|------------------------------------|------------------------------|-----------------|-----|
| Awareness of Health Worker Mortality Rates | Motivation to Become Health Worker | 0.412**                      | 0.000           | 128 |

\*\*Correlation is significant at the 0.01 level (2-tailed).

The core objective of this study was to test the relationship between Awareness of Mortality Rates (X) and Motivation (Y). The Spearman Rank Correlation analysis yielded the following results on Table 3. Statistical interpretation, correlation coefficient ( $R_s$ ), the analysis produced a Spearman correlation coefficient of 0.412. In statistical terms, this value falls within the range of a moderate positive correlation. The positive sign (+) is critical; it indicates a unidirectional relationship. As the score for awareness increases (i.e., the more a student understands the depth of the tragedy), the score for motivation also increases.

This creates a linear, albeit moderate, pattern where risk perception acts as a predictor for higher motivation. Significance value (p-value), the calculated p-value (Sig. 2-tailed) was 0.000. Since this value is significantly lower than the standard alpha level of 0.05 ( $0.000 < 0.05$ ), the result is statistically significant. Decision, based on these figures, the Null Hypothesis ( $H_0$ ) is rejected, and the alternative hypothesis ( $H_1$ ) is accepted.

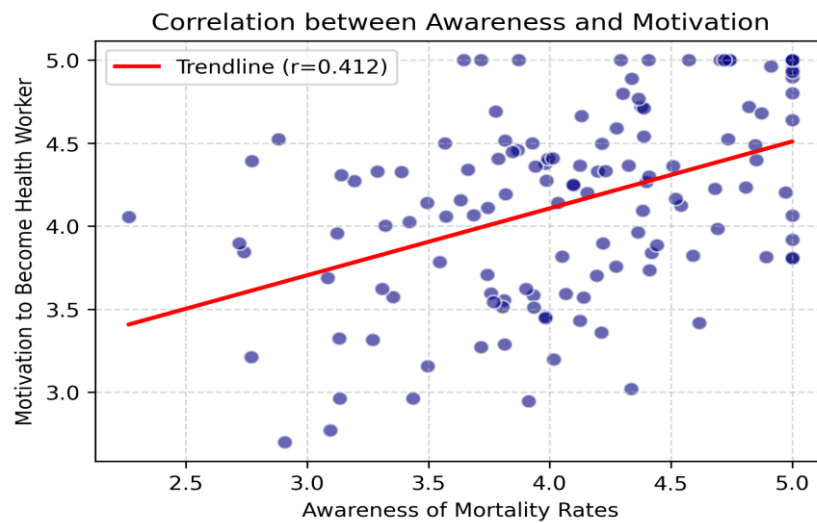


Fig. 3. Scatter plot showing the positive correlation ( $(R_s) = 0.412$ ) between mortality awareness and career motivation

The statistical evidence confirms that there is a significant positive relationship between the mortality rates of health workers and student motivation. The coefficient of determination ( $R^2$ ), which can be approximated by squaring the correlation coefficient ( $\{0.412\}^2 \approx 0.17$ ), suggests that awareness of mortality rates explains approximately 17% of the variance in student motivation. While 17% may appear modest, in social science research involving complex human psychology, this is a meaningful contribution. It implies that while other factors (such as family support, financial needs, or academic interest) also play a role, the specific phenomenon of "pandemic mortality" is a distinct and significant driver of professional intent. This empirical finding provides the foundation for the theoretical discussion regarding altruism and resilience in the subsequent section.

### 3.7 The paradox of peril: Interpreting the positive correlation

The most significant finding of this study is the counter-intuitive positive correlation ( $R_s = 0.412$ ,  $p < 0.05$ ) between the awareness of health worker mortality rates and the motivation of students to pursue healthcare careers. In the landscape of occupational health psychology, the standard expectation is that high-risk environments—characterized by elevated mortality and morbidity—act as strong deterrents to workforce entry. Protection Motivation Theory (PMT) traditionally predicts that when the "Threat Appraisal" (severity of COVID-19 and vulnerability of health workers) is high, individuals will engage in adaptive behavior to reduce that threat, often manifesting as avoidance or withdrawal from the risk source. However, our data suggests a complete inversion of this prediction among Indonesian medical and nursing students.

Instead of triggering a "flight" response, the high mortality rates appear to have triggered a "fight" response. This phenomenon can be interpreted through the lens of Terror Management Theory (TMT). TMT posits that mortality salience—the awareness that death is inevitable—drives humans to seek symbolic immortality by adhering to cultural worldviews and engaging in behaviors that grant self-esteem. For these students, the death of their seniors did not just signify biological cessation; it signified a "heroic sacrifice." By persisting in their education and aspiring to join the workforce during a plague, students

are effectively validating their own existence and seeking to become part of a legacy that transcends death. The mortality data served not as a warning sign, but as a validation of the profession's critical importance, thereby satisfying the students' intrinsic need for meaning and purpose.

### *3.8 Cultural determinants of motivation: Collectivism vs. individualism*

One of the most critical factors distinguishing this study's findings from similar research in Western contexts is the socio-cultural framework of Indonesia. While studies in the United States, United Kingdom, and parts of Europe have reported significant "moral injury," "burnout," and "intention to leave" among both professionals and students due to safety concerns (Shechter et al., 2020; Swift et al., 2020), our Indonesian cohort remained steadfast. This discrepancy can be largely attributed to the cultural dimension of Collectivism versus Individualism.

Indonesia is characterized by a high score on Hofstede's dimension of Collectivism, manifesting locally in the philosophy of *Gotong Royong* (communal cooperation/mutual assistance). In collectivist cultures, the welfare of the group often takes precedence over the comfort or safety of the individual. The identity of the individual is deeply intertwined with their social role. In Individualistic societies, the decision to enter a profession is often a calculated transaction based on personal fulfillment, safety, and remuneration. When the risks (death) outweigh the benefits, the rational individualist response is to withdraw. In Collectivist Indonesia, the healthcare profession is viewed not merely as a job but as a communal duty (*pengabdian*). The high mortality rates of health workers were likely perceived by students not as a personal threat to be avoided, but as a collective trauma that required a collective response. To withdraw during a crisis would be seen as a betrayal of the group and a violation of social norms. Thus, the external threat of the virus reinforced social cohesion and professional commitment, driving students to "fill the ranks" left by fallen mentors.

### *3.9 The "Hero Narrative" and professional identity formation*

The media portrayal of health workers during the pandemic played a pivotal role in shaping student motivation. Throughout 2020 and 2021, Indonesian media and government narratives heavily utilized military metaphors, referring to health workers as the "Garda Terdepan" (Front Guard) and "Pahlawan Kemanusiaan" (Humanitarian Heroes). From the perspective of Social Identity Theory, individuals strive to achieve a positive social identity. By aspiring to become health workers during a time of high mortality, students were aligning themselves with this high-status "Hero" group. The mortality statistics provided by the Indonesian Medical Association (IDI) functioned as a testament to the stakes involved, thereby elevating the prestige of the group. If the risk were low, the status of "heroism" would be diminished. Therefore, the high mortality rate paradoxically increased the attractiveness of the group identity, appealing to the students' idealism.

However, it is crucial to note the duality of this narrative. While effective for recruitment and motivation (as shown in our results), the "hero narrative" can be dangerous if it normalizes sacrifice. It may mask systemic failures in protection and logistics. Students motivated by this narrative may enter the workforce with a "savior complex," potentially leading to disillusionment when they face the gritty reality of resource scarcity and administrative fatigue, a phenomenon known as "reality shock." (Shanafelt et al., 2020; Spoorthy et al., 2020).

### *3.10 Post-traumatic growth (PTG) in pre-service professionals*

While much literature focuses on Post-Traumatic Stress Disorder (PTSD), our findings align more closely with the concept of Post-Traumatic Growth (PTG). PTG refers to positive psychological change experienced as a result of the struggle with highly challenging life

circumstances. Although the students were not yet on the frontlines, they were "vicarious witnesses" to the trauma unfolding in their future workplace (Xie & Kim, 2022).

The correlation between mortality awareness and motivation suggests that students were experiencing a form of anticipatory PTG. The crisis forced a cognitive restructuring of their career goals. Medicine and nursing were no longer seen as paths to stability or financial comfort, but as paths to existential significance. The awareness of death clarified their priorities, strengthening their resolve to contribute to society. This suggests that the current generation of students may possess a unique form of resilience, forged in the fire of the pandemic, which could make them a robust workforce if properly supported.

### *3.11 Implications for healthcare education, policy, and systemic reform*

#### *3.11.1 Curricular reform: Institutionalizing occupational health and disaster medicine*

The findings of this study, which illuminate the paradoxical positive correlation between mortality awareness and career motivation among Indonesian medical and nursing students, carry profound and far-reaching implications. While the resilience and altruism demonstrated by this generation of students are commendable, relying solely on their individual motivation to sustain the healthcare workforce is sustainable neither for the educational sector nor for the national health system. The high mortality rates witnessed during the COVID-19 pandemic must serve as a clarion call for a fundamental restructuring of how health professionals are trained, supported, and protected in developing nations. The following sections detail the necessary transformations across curricular, psychological, and systemic dimensions.

The traditional medical and nursing curricula in Indonesia, akin to many developing nations, have historically prioritized clinical diagnostics and therapeutic interventions focused on individual patient care. Occupational Health and Safety (OHS) and Disaster Medicine have often been relegated to elective courses or brief modules. The pandemic has exposed the lethality of this gap. Educational institutions must pivot from a purely clinical curriculum to one that integrates OHS and Disaster Medicine as core, non-negotiable competencies (Chandratre, 2020; Frenk et al., 2022; Lazarus et al., 2020; Soled et al., 2020).

From theory to survival skills, it is insufficient to merely teach students the theoretical pathways of infection. Curricula must now emphasize the rigorous, military-grade application of infection control protocols. Students motivated by the challenge must be equipped with the skills to survive it. Understanding the physics of aerosol transmission, the correct doffing and donning of Personal Protective Equipment (PPE) under high-stress conditions, and the engineering controls of isolation wards must become as fundamental as learning anatomy or physiology. Simulation-based training, utilizing high-fidelity scenarios where students must manage patients while maintaining their own biological safety, should be mandatory.

Risk assessment and management, future health workers must be trained to perform dynamic risk assessments. In a resource-constrained setting like Indonesia, where negative pressure rooms may be scarce, students need the cognitive tools to improvise safety solutions without compromising standards. This involves training in "crisis logistics"—understanding how to ration supplies ethically and safely when supply chains collapse, a reality many seniors faced during the delta wave. Planetary health and zoonosis, the curriculum must also broaden to include Planetary Health perspectives. Understanding the ecological drivers of pandemics (zoonotic spillover) places the student's role in a broader context, shifting their perspective from merely "treating the sick" to "guarding the interface between human and environmental health." This intellectual framing can deepen their motivation and professional identity.



### 3.11.2 Deconstructing the "Hero Narrative": Establishing psychological support systems

This study identified that students are partly driven by a "heroic" impulse to serve during a crisis. While this provides a potent initial burst of motivation, occupational psychology literature warns that motivation driven primarily by "heroism" is brittle and prone to catastrophic burnout. Heroes are culturally expected to be selfless, invulnerable, and stoic—expectations that prevent help-seeking behaviors when trauma occurs.

Transitioning to professional resilience, faculties need to establish robust mental health support systems to transition this "crisis motivation" into sustainable "professional resilience." The narrative must shift from "Heroism" (which implies sacrifice is expected) to "Professional Duty" (which implies sacrifice should be minimized through competence and safety). Psychological inoculation and pre-briefing, just as students receive vaccines for Hepatitis B, they require "psychological inoculation" against moral injury. Educational programs must include modules on "Vicarious Traumatization" and "Compassion Fatigue." Students need to be taught that feeling fear, grief, or hesitation is not a failure of their calling, but a biological response to threat. Normalizing these feelings before they enter clinical clerkships can reduce the incidence of PTSD later.

Structured mentorship programs, the gap between the idealized motivation observed in this study and the gritty reality of practice is a danger zone for disillusionment. Programs that facilitate mentorship between students and surviving senior doctors are crucial. These mentors can provide "reality testing," sharing not just technical knowledge but the emotional strategies they used to survive the high-mortality periods. This intergenerational dialogue helps bridge the gap between the student's abstract idealism and the practitioner's lived reality (Gallagher & Schleyer, 2020; Lazarus et al., 2020). Peer support mechanisms, universities should institutionalize peer support groups, such as Schwartz Rounds, where students can discuss the emotional and social aspects of working in healthcare, distinct from the clinical problem-solving. Creating safe spaces to voice anxieties about mortality risks without judgment is essential for long-term mental hygiene.

### 3.11.3 Systemic safety assurance: The reciprocal duty of the state

The high motivation of students must not be exploited by the state. Policymakers must recognize that the social contract between the healthcare workforce and the government is reciprocal. If students are willing to sign up for a profession that carries a risk of death, the state has an absolute moral and legal duty to minimize that risk to the lowest possible level. Infrastructure as a Moral obligation, the high mortality rate of the previous generation of workers was partly due to infrastructural collapse—lack of oxygen, insufficient PPE, and overwhelmed facilities. Investment in healthcare infrastructure is not just a logistical necessity; it is a moral obligation to the motivated generation identified in this study. To rely on their "spirit of service" while failing to provide adequate physical protection is unethical.

Legal protections and insurance, policy reforms should include guaranteed comprehensive health insurance and life insurance for medical and nursing students entering clinical rotations. Furthermore, legal frameworks should be established to protect students who, in good faith, withdraw from clinical duties if adequate protective equipment is not provided. The "right to refuse unsafe work" must be codified within the educational context to prevent the exploitation of their altruism.

Data-Driven workforce planning, the government must use data on student motivation to plan for future surges. Knowing that students are willing to volunteer, the state should create a "Student Reserve Corps" structure—a formalized, trained, and equipped body of students who can be mobilized safely during national emergencies, rather than the ad-hoc and chaotic mobilization seen in the past. This formalization ensures that their motivation is channeled through safe, supervised, and legally protected avenues.

#### 3.11.4 Ethical preparedness and the "Hidden Curriculum"

The pandemic forced health workers to make impossible ethical choices, such as triaging ventilators or allocating scarce ICU beds. These moral dilemmas contributed significantly to the psychological distress of the workforce. For the current students, who observed these dilemmas from the periphery, there is a need for explicit ethical training (Wicaksono et al., 2021).

Bioethics in crisis, standard bioethics courses often focus on individual patient autonomy. The curriculum must expand to include public health ethics and crisis standards of care. Students need to grapple with utilitarian frameworks (doing the greatest good for the greatest number) in the classroom before they face them in the emergency room. Discussing these scenarios in a safe academic environment provides an "ethical rehearsal," reducing the "moral shock" when they eventually encounter them in practice.

The hidden curriculum of silence, medical education often has a "hidden curriculum" that praises stoicism and silence in the face of suffering. This study's findings suggest that students are motivated by the "legacy" of their seniors. Educators must be careful not to romanticize the deaths of these seniors as necessary sacrifices. Instead, the ethical discussion should focus on the preventability of those deaths. The narrative should be "They were brave, but they should not have had to die. Your duty is to serve, but your duty is also to advocate for a system where such sacrifice is unnecessary."

#### 3.11.5 Leveraging cultural assets for resilience

The discussion of implications would be incomplete without addressing the specific cultural context of Indonesia. The findings suggest that the collectivist culture and the spirit of Gotong Royong (mutual cooperation) played a role in sustaining motivation. Communal coping strategies, educational interventions should leverage this cultural asset.

Training programs can emphasize "Team-Based Resilience" rather than just individual resilience. Teaching students how to monitor their colleagues for signs of stress (a "buddy system") aligns with local cultural values and creates a denser safety net than Western-centric, individualistic mental health models. Spiritual and community integration, for many Indonesian students, motivation is tied to religious and community service values. Educational institutions should engage with religious and community leaders to provide spiritual support structures that align with scientific medical training. This holistic approach respects the students' identities and provides an additional layer of psychological buffering against trauma.

#### 3.11.6 Addressing the "silent minority"

While the majority of students showed high motivation, the data revealed a "silent minority" (represented by the variance in the withdrawal intent items) who are fearful and considering leaving the profession. This group represents a critical vulnerability in the future workforce pipeline. Early identification and remediation, faculties need mechanisms to identify students experiencing "pre-traumatic stress" or high anxiety regarding their career choice.

These students should not be shamed or forced to conform to the majority's "heroic" enthusiasm. Instead, they require targeted counseling and career guidance. Retaining them might involve offering alternative pathways within healthcare that are less patient-facing (e.g., pathology, public health research, telemedicine) but equally vital. Flexible educational pathways, the rigid structure of medical education often leaves students feeling trapped. Offering temporary "pause" options during crisis peaks for students who are immunocompromised or psychologically overwhelmed can prevent them from dropping out entirely, preserving human capital for the long term.

### 3.11.7 Summary of implications

In conclusion, the paradox of high motivation amidst high mortality is a testament to the human spirit and the specific resilience of the Indonesian student body. However, this motivation is a finite resource. It is a spark that can either be fanned into a sustainable flame of professional dedication or extinguished by the harsh winds of systemic neglect. The onus is now on educators, policymakers, and healthcare leaders to build the vessel that protects this flame. By reforming curricula to include survival skills, establishing psychological safety nets, guaranteeing physical protection, and honoring the ethical complexities of the profession, we can ensure that the next generation of health workers is not only willing to serve but is also able to survive and thrive in the face of future global health challenges. The legacy of the 1,967 fallen health workers in Indonesia should not be a call for more martyrs, but a mandate for a safer, smarter, and more resilient healthcare system.

## 4. Conclusions

This study concludes that the high mortality rates among healthcare workers during the COVID-19 pandemic in Indonesia exerted a paradoxically positive influence on the career motivation of medical and nursing students. The statistical evidence ( $R_s = 0.412$ ,  $p < 0.001$ ) decisively rejects the conventional assumption derived from Protection Motivation Theory that high occupational risk inevitably leads to workforce attrition. Instead, the findings align robustly with Terror Management Theory, suggesting that for Indonesian students, the "mortality salience" of their profession did not trigger avoidance, but rather reinforced their desire to seek existential meaning through the "heroic" pursuit of healing. The tragic loss of 1,967 health workers was interpreted not as a warning to flee, but as a call to arms to fill the void left by fallen mentors.

A critical and novel contribution of this study is the insight into the resilience of students from Eastern Indonesia (Papua, Sulawesi, and Nusa Tenggara), who constituted a significant portion of the respondent pool. These students maintained high motivation ( $M = 4.28$ ) despite facing a "double burden" of pandemic risk and historical infrastructural scarcity. This suggests that the spirit of Gotong Royong (communal cooperation) and the drive to serve underserved communities act as powerful psychological buffers against fear. The motivation observed is not merely a fleeting emotional reaction but a deeply rooted vocational commitment formed in the face of systemic vulnerability.

However, this profound motivation must be nurtured with extreme caution. The finding that students are willing to "run towards the fire" places a heavy moral and ethical burden on educational institutions and the government. Ideally, altruism should be a renewable resource, not a sacrificial one. For educators, there is an urgent need to reform curricula to move beyond clinical competence to include "survival competence", rigorous training in bio-safety, disaster logistics, and psychological resilience. For policymakers, the state must recognize that while the spirit of the workforce is willing, the flesh is vulnerable. Relying on the "hero narrative" to compensate for lack of PPE or safety protocols is unethical. The high motivation of this generation must be matched by a reciprocal commitment from the state to provide guaranteed protection, insurance, and mental health support.

Ultimately, the COVID-19 pandemic has forged a generation of Indonesian health students who are battle-hardened before they even enter the ward. They are not naive to the risks; they are aware, yet they persist. Future research should focus on longitudinal studies to ensure this "crisis motivation" transitions into sustainable "professional retention." The legacy of the fallen health workers should not only be a source of inspiration for the students but a stern mandate for the nation to build a healthcare system that is worthy of their dedication, one where safety is not a luxury, but a fundamental right.

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## Author Contribution

Conceptualization, K.M.Y. and A.D.P.; Methodology, C.H.P.; Validation, K.M.Y.; Formal Analysis, A.D.P.; Investigation, C.H.P.; Resources, B.B.; Data Curation, B.B.; Writing – Original Draft Preparation, K.M.Y.; Writing – Review & Editing, A.D.P. and C.H.P.; Visualization, K.M.Y.; Supervision, K.M.Y.; Project Administration, A.D.P. All authors have read and agreed to the published version of the manuscript.

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## Ethical Review Board Statement

Ethical review and approval were waived for this study due to the non-interventional nature of the research. The study utilized an anonymous online survey that did not involve physical intervention or the collection of sensitive biological data, and all participation was voluntary in accordance with the ethical standards of the institution.

## Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

## Data Availability Statement

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy reasons regarding the identity of the specific universities involved.

## Conflicts of Interest

The authors declare no conflict of interest.

## Declaration of Generative AI Use

During the preparation of this work, the authors used Turnitin and Grammarly to assist in refining the grammatical structure, enhancing academic vocabulary, and improving the clarity of the narrative flow. After using this tool, the authors reviewed and edited the content as needed and took full responsibility for the content of the publication.

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## References

Agustina, R., Rianda, D., Lamuri, A., Ekawidyani, K. R., Siregar, D. A. S., Sari, D. S., Wulan, P. M., Devana, N. D., Syam, A. F., Rahyussalim, A. J., Handayani, D. O., Widyastuti, W., Shankar,

- A. H., & Salama, N. (2024). The impact of government pandemic policies on the vulnerability of healthcare workers to SARS-CoV-2 infection and mortality in Jakarta Province, Indonesia. *Annals of Medicine*, 55(2), 2293306. <https://doi.org/10.1080/07853890.2023.2293306>
- Amin, F., Sharif, S., Saeed, R., Durrani, N., & Jilani, D. (2020). COVID-19 pandemic—knowledge, perception, anxiety and depression among frontline doctors of Pakistan. *BMC Psychiatry*, 20(1), 459. <https://doi.org/10.1186/s12888-020-02864-x>
- Byrnes, Y. M., Civantos, A. M., Go, B. C., McWilliams, T. L., & Rajasekaran, K. (2020). Effect of the COVID-19 pandemic on medical student career perceptions: A national survey study. *Medical Education Online*, 25(1), 1798088. <https://doi.org/10.1080/10872981.2020.1798088>
- Chandratre, S. (2020). Medical students and COVID-19: Challenges and supportive strategies. *Journal of Medical Education and Curricular Development*, 7, 2382120520935059. <https://doi.org/10.1177/2382120520935059>
- Collado-Boira, E. J., Ruiz-Palomino, E., Salas-Media, P., Folch-Ayora, A., Muriach, M., & Baliño, P. (2020). “The COVID-19 outbreak”—An empirical phenomenological study on perceptions and psychosocial considerations surrounding the immediate incorporation of final-year Spanish nursing and medical students into the health system. *Nurse Education Today*, 92, 104504. <https://doi.org/10.1016/j.nedt.2020.104504>
- Daryanto, B., Kurniawan, J., Wiranigitasari, Hioe, F., Nurhadi, P., & Yudhantara, D. S. (2023). Prevalence of burnout and its associated factors among medical students during COVID-19 pandemic in Indonesia: A cross-sectional study. *PLOS ONE*, 18(6), e0285986. <https://doi.org/10.1371/journal.pone.0285986>
- Ekawati, L. L., Arif, A., Hidayana, I., Nurhasim, A., Munziri, M. Z., Lestari, K. D., Tan, A., Ferdiansyah, F., Nashiruddin, F., Adnani, Q. E. S., Malik, H., Maharani, T., Riza, A., Pasaribu, M., Abidin, K., Andrianto, A. A., Nursalam, Suhardiningsih, A. V. S., Jubaedah, A., ... Elyazar, I. R. F. (2022). Mortality among healthcare workers in Indonesia during 18 months of COVID-19. *PLOS Global Public Health*, 2(12), e0000893. <https://doi.org/10.1371/journal.pgph.0000893>
- Frenk, J., Chen, L. C., Chandran, L., Groff, E. O. H., King, R., Meleis, A., & Fineberg, H. V. (2022). Challenges and opportunities for educating health professionals after the COVID-19 pandemic. *The Lancet*, 400(10362), 1539–1556. [https://doi.org/10.1016/S0140-6736\(22\)02092-X](https://doi.org/10.1016/S0140-6736(22)02092-X)
- Gallagher, T. H., & Schleyer, A. M. (2020). “We signed up for this!”—Student and trainee responses to the COVID-19 pandemic. *New England Journal of Medicine*, 382(25), e96. <https://doi.org/10.1056/NEJMp2005234>
- Kang, L., Ma, S., Chen, M., Yang, J., Wang, Y., Li, R., Yao, L., Bai, H., Cai, Z., Yang, B. X., Hu, S., Zhang, K., Wang, G., Ma, C., & Liu, Z. (2020). Impact on mental health and perceptions of psychological care among medical and nursing staff in Wuhan during the 2019 novel coronavirus disease outbreak: A cross-sectional study. *Brain, Behavior, and Immunity*, 87, 11–17. <https://doi.org/10.1016/j.bbi.2020.03.028>
- Kompas. (2021). *Hingga akhir Agustus 2021, 1.967 tenaga kesehatan di Indonesia meninggal akibat Covid-19*. Kompas.
- Lai, J., Ma, S., Wang, Y., Cai, Z., Hu, J., Wei, N., Wu, J., Du, H., Chen, T., Li, R., Tan, H., Kang, L., Yao, L., Huang, M., Wang, H., Wang, G., Liu, Z., & Hu, S. (2020). Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Network Open*, 3(3), e203976. <https://doi.org/10.1001/jamanetworkopen.2020.3976>
- Lazarus, G., Mangkuliguna, G., & Findyartini, A. (2020). Medical students in Indonesia: An invaluable living gemstone during coronavirus disease 2019 pandemic. *Korean Journal of Medical Education*, 32(3), 237–241. <https://doi.org/10.3946/kjme.2020.165>
- Lazarus, G., Findyartini, A., Putera, A. M., Gamalliel, N., Nugraha, D., Adli, I., Phowira, J., Azzahra, L., Ariffandi, B., & Widyahening, I. S. (2021). Willingness to volunteer and readiness to practice of undergraduate medical students during the COVID-19

- pandemic: A cross-sectional survey in Indonesia. *BMC Medical Education*, 21, 138. <https://doi.org/10.1186/s12909-021-02576-0>
- Liu, Q., Luo, D., Haase, J. E., Guo, Q., Wang, X. Q., Liu, S., Xia, L., Liu, Z., Yang, J., & Yang, B. X. (2020). The experiences of health-care providers during the COVID-19 crisis in China: A qualitative study. *The Lancet Global Health*, 8(6), e790–e798. [https://doi.org/10.1016/S2214-109X\(20\)30204-7](https://doi.org/10.1016/S2214-109X(20)30204-7)
- O'Byrne, L., Gavin, B., & McNicholas, F. (2020). Medical students and COVID-19: The need for pandemic preparedness. *Journal of Medical Ethics*, 46(9), 623–626. <https://doi.org/10.1136/medethics-2020-106353>
- Pyszczynski, T., Solomon, S., & Greenberg, J. (2015). Thirty years of terror management theory: From genesis to revelation. *Advances in Experimental Social Psychology*, 52, 1–70. <https://doi.org/10.1016/bs.aesp.2015.03.001>
- Pyszczynski, T., Lockett, M., Greenberg, J., & Solomon, S. (2021). Terror Management Theory and the COVID-19 pandemic. *Journal of Humanistic Psychology*, 61(2), 173–189. <https://doi.org/10.1177/0022167820959488>
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *The Journal of Psychology*, 91(1), 93–114. <https://doi.org/10.1080/00223980.1975.9915803>
- Rose, S. (2020). Medical student education in the time of COVID-19. *JAMA*, 323(21), 2131–2132. <https://doi.org/10.1001/jama.2020.5227>
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>
- Savitsky, B., Findling, Y., Erel, A., & Hendel, T. (2020). Anxiety and coping strategies among nursing students during the COVID-19 pandemic. *Nurse Education in Practice*, 46, 102809. <https://doi.org/10.1016/j.nepr.2020.102809>
- Shanafelt, T., Ripp, J., & Trockel, M. (2020). Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *JAMA*, 323(21), 2133–2134. <https://doi.org/10.1001/jama.2020.5893>
- Shechter, A., Diaz, F., Moise, N., Anstey, D. E., Ye, S., Agarwal, S., Birk, J. L., Brodie, D., Cannone, D. E., Chang, B., Claassen, J., Cornelius, T., Derby, L., Dong, M., Givens, R. C., Hochman, B., Homma, S., Kronish, I. M., Lee, S. A. J., ... Abdalla, M. (2020). Psychological distress, coping behaviors, and preferences for support among New York healthcare workers during the COVID-19 pandemic. *General Hospital Psychiatry*, 66, 1–8. <https://doi.org/10.1016/j.genhosppsych.2020.06.007>
- Soled, D., Goel, S., Barry, D., Erfani, P., Joseph, N., Kochis, M., Uppal, N., Velasquez, D., Vora, K., & Scott, K. W. (2020). Medical student mobilization during a crisis: Lessons from a COVID-19 medical student response team. *Academic Medicine*, 95(9), 1384–1387. <https://doi.org/10.1097/ACM.0000000000003401>
- Spoorthy, M. S., Pratapa, S. K., & Mahant, S. (2020). Mental health problems faced by healthcare workers due to the COVID-19 pandemic—A review. *Asian Journal of Psychiatry*, 51, 102119. <https://doi.org/10.1016/j.ajp.2020.102119>
- Swift, A., Banks, L., Baleswaran, A., Cooke, N., Little, C., McGrath, L., Meehan-Rogers, R., Neve, A., Rees, H., Tomlinson, A., & Williams, G. (2020). COVID-19 and student nurses: A view from England. *Journal of Clinical Nursing*, 29(17–18), 3111–3114. <https://doi.org/10.1111/jocn.15298>
- Wang, P.-W., Ahorsu, D. K., Lin, C.-Y., Chen, I.-H., Yen, C.-F., Kuo, Y.-J., Griffiths, M. D., & Pakpour, A. H. (2021). Motivation to have COVID-19 vaccination explained using an extended Protection Motivation Theory among university students in China: The role of information sources. *Vaccines*, 9(4), 380. <https://doi.org/10.3390/vaccines9040380>
- Wicaksono, R. B., Ferine, M., Lestari, D. W. D., Hidayah, A. N., & Muhaimin, A. (2021). Experience of Indonesian medical students of ethical issues during their clinical clerkship in a rural setting. *Journal of Medical Ethics and History of Medicine*, 14, 6. <https://doi.org/10.18502/jmehm.v14i6.6750>

- World Health Organization. (2021). *The impact of COVID-19 on health and care workers: A closer look at deaths*. Health Workforce Department – Working Paper 1. <https://apps.who.int/iris/handle/10665/345300>
- Xie, C.-S., & Kim, Y. (2022). Post-traumatic growth during COVID-19: The role of perceived social support, personality, and coping strategies. *Healthcare*, 10(2), 224. <https://doi.org/10.3390/healthcare10020224>

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