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When high self-efficacy backfires: Understanding withholding effort among healthcare workers during communicable diseases outbreaks

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Abstract

Healthcare workers (HCWs) are often at the frontline of communicable disease outbreaks, facing heightened risks that can influence their propensity to withhold effort. This study examined the influence of socio-cognitive factors (risk perception, perceived vulnerability to disease, and self-efficacy) on withholding effort among HCWs during communicalbe disease outbreaks. Using a quantitative cross-sectional survey with a high response rate (87%), data were collected from 477 HCWs across selected hospitals in Ondo State, Nigeria. A 2×2×2 factorial design was employed to test the hypotheses. Results showed that higher risk perception [F (1, 469)=13.89, P<.001, η^2=.029], higher perceived vulnerability to disease [F (1, 469)=22.95, P<.001, η^2=.047], and higher self-efficacy [F (1, 469)=10.04, P<.05, η^2=.021] were associated with increased withholding effort. The interaction between self-efficacy and perceived vulnerability was significant [F (1, 469)=10.10, P<.05, η^2=.021], indicating that the positive effect of self-efficacy on withholding effort emerged most strongly when vulnerability to disease was high (M=29.01). These findings highlight that withholding effort is not always a failure of motivation but reflects a protective response to perceived threats. The study recommends targeted and structured training to build confidence, a supportive work environment, and adequate resources to reduce withholding effort and sustain healthcare workers' commitment during future outbreaks.

Keywords: Risk perception, Perceived vulnerability, Self-efficacy, Withholding effort, Communicable disease outbreaks, Healthcare workers.

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1. Introduction

The recrudescence of communicable diseases continues to pose significant threats to global public health. The recent COVID-19 pandemic had a more profound global impact, mainly due to its heightened infectivity and pathogenicity, than earlier re-emerging epidemics such as tuberculosis, Lassa fever, and Ebola [1]. Between January 2020 and May 2021 alone, COVID-19 claimed the lives of 6,643 healthcare workers (HCWs) globally, while the World Health Organization (WHO) estimated the actual death toll to be as high as 115,500, owing to unreported cases from several countries [2]. Tuberculosis (TB) also remains a significant public health concern, causing an estimated 1.25 million deaths globally in 2023, with about 500,000 incident cases in Nigeria [3]. In South Africa, TB accounted for 51,000 deaths in 2022 [4]. Given these alarming numbers of casualties among the general population and HCWs during health crises, it is likely that HCWs will perceive heightened risk and vulnerability during communicable disease outbreaks, which in turn may influence their effort on the job.

There is no way that risk can be removed from the daily duty of healthcare workers. This reality has drawn attention to risk-related psychological dispositions such as risk perception and perceived vulnerability to disease and is linked to workforce outcomes, including turnover [5] burnout [6, 7] absenteeism [8] neglect [9] and, more recently, an emerging but underexplored concept in the context of healthcare during disease outbreaks: withholding effort. Withholding effort is the tendency or predisposition to offer a particular level of effort [10] that may not be sufficient to execute an organizational task efficiently and effectively. It refers to the intentional or unintentional reduction of one's work input, a behaviour that can significantly undermine healthcare outcomes. Withholding effort may be a protective behaviour for HCWs, protecting them from harm. However, it is maladaptive behaviour nonetheless, as it is not for the greater good of the entire population.

Significantly, perception of risk and perceived vulnerability to disease may greatly influence HCWs' obligation to care for infected patients [5, 6, 9]. Due to individual differences in response to stimuli, some employees may perceive themselves as less vulnerable to disease and, consequently, be more willing to take risks than others. Risk perception broadly reflects how individuals judge the likelihood and severity of undesirable events such as illness or death [11] while perceived vulnerability, or susceptibility, concerns one's sense of the probability of experiencing such threats. These perceptions are particularly relevant in understanding how HCWs navigate their professional responsibilities amid life-threatening outbreaks. With the belief in one's ability to organize and execute necessary actions and self-efficacy [12] these socio-cognitive factors may influence organizational outcomes, including the tendency to withhold effort during communicable disease outbreaks.

The global experience of disease outbreaks such as COVID-19, Ebola, and Lassa fever has accentuated the indispensable role of HCWs in disease prevention, control, and treatment. As the backbone of infection prevention and control systems, HCWs are consistently at greater risk of contagion during epidemics and pandemics than the general population [13]. Despite HCWs' confidence in their ability to perform job tasks effectively in crises, the intensity of healthcare demands, the inherent risks of infection, and the psychological climate during outbreaks may critically shape withdrawal behaviours, including withholding effort. When HCWs reduce effort, the ripple effect (e.g., delayed response, overstretched colleagues, and avoidable casualties) is profound on the general population.

Understanding the socio-cognitive factors that influence healthcare workers' decisions to withhold or exert effort is therefore vital. While risk perception has received considerable attention in healthcare literature, there is limited empirical inquiry into the role of self-efficacy and its effects under high-risk situations [14]. This gap is particularly significant for underdeveloped and developing economies with fragile health systems. Addressing this gap is critical for protecting frontline workers and advancing Sustainable Development Goal 3, ensuring healthy lives and promoting well-being, and Goal 8 emphasizes safe and productive work environments. Therefore, this study examines how risk perception, perceived vulnerability to disease, and self-efficacy influence healthcare workers' withholding effort during communicable disease outbreaks.

The specific objective of this study is to investigate the influence of socio-cognitive factors (risk perception, perceived vulnerability to disease, and self-efficacy) on withholding effort and how their interactions may explain variations in HCWs' withholding effort during communicable disease outbreaks.

The following hypotheses were formulated in line with the specific objective of this study.

2. Hypotheses

1. a) Healthcare workers who perceived risk to be high will report a higher propensity to withhold effort.

b) High self-efficacy will be associated with a lower propensity to withhold effort among healthcare workers.

c) Healthcare workers who perceived vulnerability to disease to be high will report higher propensity to withhold effort.

2. a) Healthcare workers with low self-efficacy and high perceived risk will withhold significantly higher levels of effort than healthcare workers with high self-efficacy and high perceived risk.

b) Healthcare workers with low self-efficacy and high perceived vulnerability to disease will withhold significantly higher levels of effort than healthcare workers with high self-efficacy and high perceived vulnerability to disease.

c) Healthcare workers who report high perceived risk and high perceived vulnerability to disease will withhold significantly higher levels of effort than healthcare workers who report low perceived risk and low perceived vulnerability to disease.

3. Healthcare workers who report low perceived risk, low perceived vulnerability to disease, but high self-efficacy will withhold significantly lower levels of effort than healthcare workers who report high perceived risk, high perceived vulnerability to disease, but low self-efficacy.

3. Literature Review

3.1. Theoretical Background

Protective Motivation Theory (PMT) constitutes a robust theoretical framework for explaining the cognitive processes through which individuals evaluate potential threats and adopt protective behaviour [15]. Initially developed in health psychology, studies have widely used PMT to explain behavioural responses in health and environmental contexts. At its core, the theory proposes that when faced with threatening situations, people undergo two forms of appraisal: threat and coping [16]. These appraisals shape whether an individual adopts adaptive protective behaviours or engages in maladaptive responses such as avoidance or withdrawal.

Healthcare workers are no exception. Like everyone else, they interpret and respond to risks based on how threatening the situation appears and how confident they feel about coping. During communicable disease outbreaks, HCWs may perceive their susceptibility as high and the severity of the threat as significant, depending on the type of disease (e.g., COVID-19, tuberculosis, Ebola) and the resources available to protect them (e.g., quality of PPE, institutional support). Where both risk perception and vulnerability are heightened, the threat appraisal process leads to the anticipation of adverse outcomes and possible harm, such as infection or death.

Following threat appraisal, PMT posits that individuals engage in coping appraisal, which entails evaluating whether they can effectively manage the threat. For HCWs, this may include assessing their confidence in their skills and capacity to tackle the threat (self-efficacy), the response efficacy of protective measures provided, and the costs or sacrifices involved in continued engagement. In such scenarios, HCWs may weigh personal benefits (recognition, financial incentives, skill acquisition) and broader social gains (saving lives, preventing escalation of an outbreak) against the potential risks of exposure and harm.

As the name suggests, PMT emphasizes that motivation for action is grounded in the drive for protection. In healthcare work during health crises, when the perceived threat (risk perception and perceived vulnerability to disease) outweighs coping resources (self-efficacy), HCWs may resort to withholding effort or disengaging from frontline responsibilities. While such behaviour is understandable as self-protection or adaptive intentions [15, 16] it can also be maladaptive in collective health terms. This assertion aligns with Ezati Rad, et al. [17] assertion, who argued that “the adoption of protective behaviours is ultimately determined by the individual’s motivation to safeguard themselves” (p. 1).

PMT offers a valuable lens for explaining HCWs' responses during epidemics and pandemics. It highlights that decisions to exert or to withhold effort are not simply professional choices, but intensely human reactions shaped by threat appraisal (risk perception and perceived vulnerability to disease) and coping appraisal (self-efficacy). Situating this study within the PMT framework thus allows for a better understanding of how socio-cognitive factors interact to shape withholding effort among healthcare workers in times of crisis.

In support of the theoretical background of this study, high threat appraisal influences protective behaviour, and high levels of fear relating to COVID-19 are positively associated with turnover intention among frontline HCWs [18]. The study, which aimed to detect the impact of fear of COVID-19 on turnover intention, reported that the higher the risk perceived of COVID-19, the higher the HCWs' intention to leave. The study established a link between risk perception and turnover intention. A similar link was established between risk perception of COVID-19 and turnover intentions among 178 doctors, nurses, and paramedic staff who treated COVID-19 patients [19]. Thus, risk perception of the pandemic is expected to enhance fear among HCWs, consequently heightening HCWs' propensity to withhold effort.

Iyiani, et al. [9] investigated HCWs’ attitudes towards patients during the COVID-19 pandemic in Nigeria. The study confirmed that HCWs exhibited a negative attitude towards patients during the pandemic, mainly due to fear of contracting the virus, inadequate PPE, and poor remuneration. In Enugu state, this behaviour contributed to a surge in COVID-19-unrelated deaths, as patients, including pregnant women requiring antenatal care, avoided hospitals out of fear of infection. Similarly, Mahlangu, et al. [20] explored the experiences of 44 frontline HCWs at the onset of the COVID-19 pandemic in South Africa. Their findings revealed that heightened anxiety, exposure to many patients, and witnessing colleagues’ deaths intensified perceived risk and vulnerability to COVID-19. These experiences, in turn, fostered fear of death, burnout, and fatigue among HCWs.

A recent qualitative study discovered risk perception in the form of mental toll of positions held, inadequate staffing, current state of the healthcare system, how COVID-19 specifically made their work harder, and influenced burnout and turnover among 49 HCWs who have withdrawn their services from providing direct patient care [7]. In this study, the risk perception of health care work during outbreaks and the impact of the communicable disease (COVID-19) influenced some HCWs to leave the frontline and some, the healthcare industry. This assertion is consistent with earlier findings by Liu, et al. [21] that reported a significant and positive direct effect of risk perception on job withdrawal among nurses. This finding further confirms relationship between risk perception and withholding behaviour during communicable disease outbreaks.

Research has identified several factors contributing to HCWs’ intention to turnover during pandemics. Stress and burnout play a central role in the relationship between risk perception and withholding effort, beyond fear of infection. Specifically, younger to middle-aged workers, those with heavier workloads, financial difficulties, workplace conflicts, poor adherence to PPE/IPC protocols, and inadequate emotional support have all been reported to heighten risk perception and vulnerability, thereby increasing the likelihood of considering exit from the profession [22]. In Vietnam, high turnover among those caring for people living with HIV/AIDS was driven by stigma, family pressure, devaluation by colleagues, loss of social prestige, and the stress of caring for patients with AIDS [23, 24]. These findings illustrate how risk perception, compounded by psychological, social, and structural stressors, can heighten vulnerability and drive withdrawal behaviours, including turnover and withholding effort.

Moyo, et al. [6] reported that risk perception of COVID-19 increased disengagement, burnout, low morale, and turnover intention among HCWs (n=443) in Zimbabwe. The contagious nature of the virus heightened frontline workers' stress and fear, which negatively affected performance and strengthened intentions to quit. Similarly, Yang, et al. [25] reported that frontline involvement and high job-related burden among psychiatrists in China were linked to greater turnover intention. While not addressing withdrawal behavior directly, Ariyo, et al. [26] found that perceived vulnerability to COVID-19 significantly predicted fear among Nigerian HCWs, further highlighting the role of risk perception in shaping work-related outcomes such as withholding effort in different populations of study.

In a qualitative study, Chinese Singaporean nurses (n = 10) with close contact with patients infected with acute respiratory disease and who worked during SARS and H1N1 identified living with risk, the SARS experience, and risk acceptance as key themes shaping their risk perception [27]. These HCWs were concerned about infection and transmission, especially to vulnerable groups, yet prior SARS experience reduced the perceived severity of later outbreaks. Rather than withdrawing effort, nurses continued caring for patients. The finding is consistent with Koh, et al. [28] review, which shows that healthcare workers perceived risks and stigma but largely accepted them as occupational hazards. Similarly, Gee and Skovdal [29] reported that frontline healthcare workers' (n=11) described that their willingness to respond was sustained by factors such as curiosity, trust in organizational policies and colleagues, effective communication, and prior experiences with infections and death. These elements foster resilience and ongoing commitment to work. On the other hand, exposure to colleagues contracting Ebola, heightened concerns about the safety of loved ones, negative community attitudes, and lack of trust in team leadership contributed to a reduced willingness to continue working. Notably, the study further showed that self-efficacy shaped healthcare workers' decisions to engage, suggesting that confidence in one's ability to manage risks is pivotal in sustaining willingness to respond during high-risk outbreaks.

Fear of COVID-19 exposure was the most frequently reported theme across 43 studies in a systematic review examining healthcare workers' (HCWs) turnover intention during the pandemic. The review also highlighted adverse working conditions, and psychological responses such as stress, depression, anxiety, and fatigue were positively associated with turnover intention in diverse countries, including Germany, the United Kingdom, Saudi Arabia, and Iran [30]. Similarly, Nazir, et al. [31] reported that role stressor components such as role ambiguity, role conflict, and work-family conflict significantly impacted nurses' turnover intention in Pakistan; also, nurses' self-efficacy reduced intention to leave by moderating the relationship between organisational cynicism and turnover intention.

There has been an established link between self-efficacy and various work outcomes, e.g., withdrawal behaviours, commitment Eze and Ikebuaku [32] willingness to report Gee and Skovdal [29] work engagement, and expectedly withholding effort. Self- reflects one's perceived capability to perform a given task. Bandura [33] such as working in a health facility during a disease outbreak. This confidence is believed to increase engagement [34] and reduce adverse work outcomes such as withholding effort, turnover intention, etc. For example, Ghani, et al. [35] reported that self-efficacy positively influenced well-being and work performance of frontline healthcare professionals (n=361) during the third wave of the COVID-19 pandemic in mid-2021. In support of adverse work outcomes, self-efficacy was reported to have negatively impacted the intention to leave the hospital among Taiwan nurses (n=417).

The significance of self-efficacy is not limited to the healthcare industry. Findings from fields outside the care industry have reported similar results. Siyethemba [36] reported from a qualitative study among employees in a university in South Africa that self-efficacy positively affects work performance. Likewise, Eze and Ikebuaku [32] in their study on occupational self-efficacy and organisational commitment among Ajaokuta Steel Company workers, Nigeria, found through regression analysis that self-efficacy significantly predicts commitment. High self-efficacy fostered more substantial organisational commitment, suggesting that low self-efficacy among healthcare workers may increase the likelihood of withholding effort, given that commitment and effort withdrawal represent opposite ends of a performance continuum.

Contrary to the dominant view that self-efficacy fosters commitment and sustained performance, Anwar and Madhakomala [37] uncovered a paradox in their study of 230 employees at a technology company in Jakarta: self-efficacy exerted a direct positive influence on turnover intent. Despite being highly skilled and confident in their abilities, employees reported consistent turnover rates of 20–30% over four years, with exit interviews citing pay, management challenges, alternative opportunities, and family considerations as key drivers of departure. This finding suggests that high self-efficacy may, under certain conditions, embolden employees to act on dissatisfaction and pursue opportunities elsewhere rather than remain committed to their current organization. Similarly, Troutman, et al. [38] found that male public accountants with higher self-efficacy reported stronger turnover intentions. Together, these findings highlight self-efficacy's complex and sometimes contradictory role in shaping employee behaviour, with implications for understanding withholding effort in high-risk or demanding contexts.

In a rapid systematic review, Baluszek, et al. [14] reported complex and partly ambiguous relations between resilience and self-efficacy among HCWs during the COVID-19 pandemic. Specifically, across six reviewed studies, self-efficacy negatively associated with burnout, anxiety, and depression [23] as well as with perceived vulnerability of COVID-19 [39]. Similarly, dental hygienist self-efficacy significantly influenced turnover intention, and the most potent factor was dental hygienist sense of competence; the higher the dental hygienist self-efficacy, the lower the turnover intention [40]. Likewise, nurses in Lebanon (n = 552) confirmed that intention to quit was reduced by both perceived supervisor support and nurses' self-efficacy [41]. These findings suggest that higher self-efficacy reduces withdrawal behaviour.

Despite growing interest in the role of self-efficacy, existing studies offer contradictory results regarding its influence on turnover intention, highlighting the need for clarification. While most studies have reported a significant negative relationship, suggesting that employees with high self-efficacy are less likely to leave their organizations (e.g., [29, 31]),

other studies have found a positive association, indicating that employees with higher self-efficacy may also feel more confident in securing alternative employment and thus report stronger turnover intentions [37]. Still, a few studies have shown no significant relationship between the two constructs [42], further underscoring the complexity of this relationship and the need for additional context-specific investigation.

In summary, evidence from previous studies shows that healthcare workers' behaviour during disease outbreaks is shaped by their perceptions of risk, perceived vulnerability to disease, and self-efficacy. Existing studies have linked heightened risk perception and vulnerability to adverse work outcomes such as reduced willingness to work, absenteeism, and withdrawal-related behaviours, particularly when fear of infection and concern for family members are pronounced. However, empirical attention has focused largely on overt withdrawal outcomes, with limited examination of more subtle forms of disengagement, such as withholding effort. Evidence on self-efficacy remains inconclusive, with some studies reporting that higher self-efficacy reduces turnover intentions, others suggesting the opposite, and some finding no significant association at all [42, 43]. These inconsistencies highlight the complex and context-dependent role of self-efficacy in shaping work behaviour and emphasize the need for further investigation, particularly within healthcare settings during communicable disease outbreaks, where sustained effort is critical to service delivery.

4. Materials and Methods

4.1. Research Design

This study is a part of a larger study. This study adopted a cross-sectional survey design. The design allows for a precise analysis of relationships between socio-cognitive factors (risk perception, perceived vulnerability to disease, and self-efficacy) and effort without any manipulation from the researcher.

4.2. Sample and Setting

The survey was conducted among healthcare workers. A purposive sampling procedure was utilised to select participants based on the eligibility criteria for this study. The eligibility criteria are characteristics that the prospective participants must have to be considered as suitable participants for the study, which include:

- Participants must be healthcare workers.
- Participants must have direct care responsibility for patients.
- Participants must be willing to participate.

This sampling technique and eligibility criteria were used because they allowed the selection of participants to participate in this study to suit the design and objective of the study. A hypothetical tuberculosis outbreak, with a mortality rate of 2–5%, was employed to assess participants' responses.

477 healthcare workers aged 19 to 66 years (M = 31, SD = 10.4) participated in the study. Employment duration ranged from 1 to 34 years, with a mean of 7 years (SD = 7.1). The sample included 274 females (57.4%) and 203 males (42.6%), with females being the majority. By profession, nurses were the most represented (60.6%), followed by doctors (21.4%), laboratory technicians (9.2%), and pharmacists (8.8%).

4.3. Measures

4.3.1. Risk Perception (RPS)

Risk perception was measured using a 5-item scale by Imai, et al. [44] previously validated among healthcare workers in Japan and Nigeria (α = .76–.78). Higher scores indicate higher risk perception.

4.3.2. Perceived Vulnerability to Disease (PVD)

The 15-item scale by Duncan, et al. [45] assessed participants' perceived susceptibility to illness. Reliability was high (α = .90), with higher scores reflecting greater vulnerability.

4.3.3. Self-Efficacy

General self-efficacy was measured with the 10-item scale by Jeruselam and Schwartz [46] rated on a four-point scale. Scores (10–40) distinguish low (10–25) and high (26–40) efficacy, with reliability ranging from α = .70 to .90.

4.3.4. Withholding Effort

Propensity to withhold effort was measured with the 11-item Healthcare Workers Propensity Scale (HEPS) developed by the researcher. Items were rated on a five-point Likert scale, with higher scores reflecting greater withholding tendency (α = .71).

4.4. Ethical Consideration

Ethical approval was sought and obtained from the Social Sciences and Humanities Research Ethics Committee (SSHREC). The research proposal and protocol were submitted to the SSHREC for review, and based on the submitted documents, full ethical approval was granted with the assigned number: UI/SSHREC/2021/003. In addition, approval was obtained from the management of the participating hospitals to facilitate and formalize data collection. The research provided each participant with a written informed consent form approved by SSHREC before participation.

4.5. Data Analysis

The data were analyzed with descriptive statistics and Three-Way Analysis of Variance (ANOVA) using the Statistical Package for Social Sciences (SPSS) version 21.0.

5. Results

This study employed 2x2x2 (3-Way) ANOVA to examine the influence of risk perception, self-efficacy, and perceived vulnerability to disease on withholding effort. The independent variables - risk perception, self-efficacy, and perceived vulnerability to disease were categorized into two levels (high and low) each, using the average score.

Table 1.
Summary of means for levels of Risk Perception, Self-Efficacy, and Perceived Vulnerability to Disease on Withholding effort.

Variables	Levels	Withholding effort	
		Mean	N
Risk perception (RP)	Low	26.17	244
	High	27.59	233
Self-efficacy (SE)	Low	26.27	246
	High	27.48	231
Perceived vulnerability to diseases (PVD)	Low	25.97	313
	High	27.79	164

Table 1 shows the mean scores of withholding efforts across the two levels (high and low) of the three predictors in this study: risk perception (RP), self-efficacy (SE), and perceived vulnerability to diseases (PVD). The table indicates that healthcare workers who perceived risk as high (M=27.59) reported a higher propensity to withhold effort than those who perceived risk to be low (M=26.17). Similarly, healthcare workers with high self-efficacy (M=27.48) demonstrated a higher tendency to withhold effort when compared with healthcare workers with low self-efficacy (M=26.27). In addition, those healthcare workers who perceived they were highly vulnerable to disease (M=27.79) had the highest propensity to withhold effort relative to those with low perceived vulnerability to disease (M=25.97).

The above preliminary results, therefore, suggest that heightened perception of risk and vulnerability to withhold effort and higher self-efficacy are associated with increased withholding of effort.

To determine if the mean difference between the high and low levels is significant, a General Linear Model (GLM) was used to test the main and interaction effects (see Table 2).

Table 2.
Summary of Three-Way ANOVA Showing the Impact of Risk Perception, Self-Efficacy, and Perceived Vulnerability on Withholding Effort.

Source	SS	df	MS	F	Sig.	np^2
Risk perception (PR)	207.94	1	207.94	13.89	<0.001	0.029
Self-Efficacy (SE)	150.432	1	150.432	10.04	<0.05	0.021
Perceived Vulnerability to Disease (PVD)	343.62	1	343.62	22.95	<0.001	0.047
PR*SE	0.29	1	0.29	0.20	>0.05	0.000
PR*PVD	43.28	1	43.28	2.89	>0.05	0.006
SE*PVD	151.21	1	151.21	10.10	<0.05	0.021
PR*SE*PVD	6.25	1	6.25	0.41	>0.05	0.001
Error	7021.52	469	14.4971			
Total	345310.00	477				

Note: R Square = 0.101 (Adjusted R Squared = 0.088).

Table 2 shows the three-was ANOVA results that revealed significant main effects of risk perception (F (1, 469) = 13.89, P<.001, η^2=.029); self-efficacy (F (1, 469) = 10.04, P<.05, η^2=.021); and perceived vulnerability to disease (F (1, 469) = 22.95, P<.001, η^2=.047) on withholding effort. These findings indicate that the main effects are significant, thus confirming the preliminary results; higher perceived risk, greater self-efficacy, and higher perceived vulnerability to disease are each associated with an increased propensity to withhold effort. This outcome supports hypotheses 1a and 1c; however, for hypothesis 1b, although the effect was significant, the direction of the result was not as hypothesized; higher self-efficacy was associated with higher withholding of effort. Thus, hypothesis 1b was not confirmed. Among the predictors, perceived vulnerability to disease had the strongest effect on withholding effort.

Table 2 further shows that among the two-way interaction effects, risk perception and self-efficacy, risk perception and perceived vulnerability to disease, and self-efficacy and perceived vulnerability to disease, only the interaction effect between self-efficacy and perceived vulnerability to disease was significant (F (1, 469) = 10.10, P<.05, η^2=.021). Thus, hypotheses 2a and 2c were not supported, and although hypothesis 2b was significant, the direction of the effect was contrary to the hypothesized relationship.

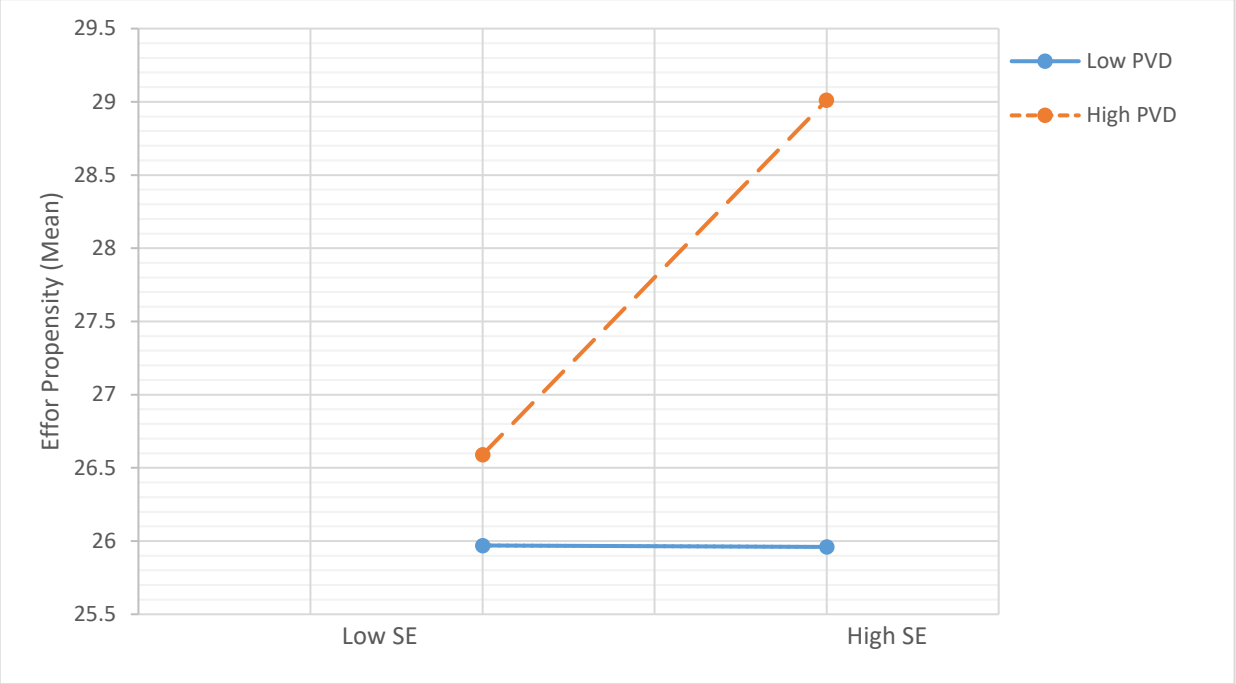

Figure 1.
Interaction of Self-Efficacy (SE) and Perceived Vulnerability to Disease (PVD on Withholding effort.

Figure 1 shows that when perceived vulnerability to disease was low, withholding effort was nearly the same for HCWs with low (M = 25.97) and high (M = 25.96) self-efficacy, indicating no significant difference between the groups. However, under conditions of high perceived vulnerability, withholding effort was significantly higher for HCWs with high self-efficacy (M = 29.01) compared to those with low self-efficacy (M = 26.59). This finding suggests that the influence of self-efficacy on withholding effort is dependent on perceived vulnerability to disease. The ordinal interaction further indicates that the positive effect of self-efficacy on withholding effort becomes more pronounced when perceived vulnerability is high.

In contrast, the three-way interaction among risk perception, self-efficacy, and perceived vulnerability to disease was not significant, and thus, hypothesis 3 was not supported based on the study result.

6. Discussion

The study examined the role of socio-cognitive factors (risk perception, perceived vulnerability to disease, and self-efficacy) in predicting withholding effort. In support of this study's theoretical background and hypotheses, the researcher found that risk perception, perceived vulnerability to disease, and self-efficacy predicted healthcare workers' withholding effort. The study also established that HCWs' self-efficacy moderated the effect of perceived vulnerability to disease on withholding effort. These findings explain and give reasons for HCWs' behavioural tendencies during epidemics and pandemics. It was found that as HCWs' risk perception, self-efficacy, and perceived vulnerability to diseases increased, their withholding effort increased. In addition, significantly greater withholding effort was reported among healthcare workers who perceived vulnerability to disease as high and with high self-efficacy, compared with healthcare workers with low self-efficacy.

Consistent with expectations, the study established that higher perceived risk was associated with greater withholding effort. This aligns with the claim of the Protection Motivation Theory, which posits that higher perceived risk motivates employees to adopt protective behaviours [15, 16]. Similarly, perceived vulnerability to disease influenced withholding effort, indicating that healthcare workers who felt susceptible to health threats such as tuberculosis were more likely to withhold higher levels of effort during an epidemic or pandemic. This finding supports prior evidence that perceived vulnerability to disease is a key determinant of protective health behaviour [47]. A classic example of this result is the refusal of HCWs to attend to patients in Nigeria due to fear during the COVID-19 outbreak [9].

During communicable disease outbreaks, the threats faced by healthcare workers extend far beyond the usual day-to-day hazard of their profession [48-50]. Healthcare workers are more vulnerable to occupational accidents, work overload [8] burnout and low morale [6, 7], stress [23], fatigue [30] contagion of disease [13], and death in some cases [2-4]. These conditions may aggravate decisions to withhold effort.

Lived experiences during the outbreak, such as witnessing colleagues' deaths, can intensify perceived risk and perceived vulnerability to disease, further driving withdrawal behaviours [29]. Evidence across working during outbreaks such as COVID-19, Ebola, HIV/AIDS, SARS etc. supports this link: studies in Nigeria [9], South Africa [20], Egypt [18], Pakistan [19], and China [21, 25] confirm that high risk perception among healthcare workers significantly influenced withdrawal behaviours such as turnover and absenteeism [8] thereby corroborating the findings of the present study on withholding effort. Against our findings, Koh, et al. [27] and Koh, et al. [28] reported that high perceived risk and

vulnerability of HCWs to acute respiratory disease did not influence turnover; healthcare workers intensified effort and accepted risk as part of the job.

Contrary to expectation, this study found that higher self-efficacy was associated with a greater tendency to withhold effort among healthcare workers during communicable disease outbreaks. While self-efficacy is typically linked with persistence, motivation, and reduced withdrawal behaviour [12, 34] this result suggests that self-efficacy may have contradictory effects under certain conditions, such as working in hospitals during outbreaks. Despite high self-efficacy, conditions such as lack of trust, absence of support, death of colleagues, media coverage, and undue exposure to disease can influence HCWs' confidence to perform their job in times of crises [29].

Empirical support for such contrary outcomes has been reported. For instance, Anwar and Madhakomala [37] suggested that self-efficacy can sometimes facilitate withdrawal when employees perceive unfair treatment and feel they have alternative opportunities. It is important to note that self-efficacy is a belief in one's capability, and despite possessing high self-efficacy, employees retain the autonomy to decide when and where to exert effort, particularly in situations where self-preservation is at stake. This assertion is further reinforced by evidence that at high levels of perceived vulnerability to disease, withholding effort rises steeply for employees with high levels of self-efficacy.

The findings suggest that while self-efficacy is typically regarded as a positive psychological resource, it may also enable adaptive withdrawal when workers feel vulnerable and face overwhelming job demands. This explanation aligns with the assumptions of the Protective Motivation Theory, which emphasizes that employees weigh coping resources (self-efficacy) against perceived threats (vulnerability to disease) when deciding on a course of action. For HCWs in this study, the cognitive appraisal process likely involved evaluating their confidence in continuing to provide care (self-efficacy) against the severity of the threat (perceived vulnerability to disease). The decision to withhold effort despite higher self-efficacy reflects this appraisal's outcome; the perceived threat outweighed the available coping resources, leading healthcare workers to adopt protective behaviour by strategically withholding a greater effort.

For healthcare workers, these findings highlight the importance of contextual factors, personal benefits, and social gains not considered in this study, that shape whether self-efficacy translates into sustained effort or strategic withholding effort. Indeed, studies have shown that perceived organizational support, fair treatment at work [37] and trust in leadership [29] are crucial in determining workers' behavioural responses and the expression of self-efficacy. Recent evidence further suggests that low organizational support and high pay satisfaction can strengthen withholding effort among HCWs [51]. Together, these findings highlight that self-efficacy, while valuable, does not operate in isolation but interacts with other socio-cognitive factors, organizational and situational conditions to shape effort-related outcomes during communicable disease outbreaks.

7. Conclusion

This study concludes that socio-cognitive factors (risk perception, perceived vulnerability to disease, and self-efficacy) significantly influence withholding effort among healthcare workers during communicable disease outbreaks. Also, perceived vulnerability to disease moderates the self-efficacy-withholding effort relationship, thus emphasizing that withholding effort is not necessarily a failure of motivation but rather an adaptive response to perceived vulnerability to disease. These findings highlight the need for healthcare organizations to strengthen protective measures, provide adequate support, and foster trust, so healthcare workers' self-efficacy translates into sustained effort delivery during communicable disease outbreaks rather than strategic withholding effort.

8. Recommendations

Based on the results of this study, the following measures are suggested to reduce withholding effort in future communicable disease outbreaks:

- Capacity building through training: Government, policy makers, and other stakeholders in the health sector should strengthen the confidence of healthcare workers by providing regular, targeted training on outbreak preparedness and emergency response. Training should emphasize coping strategies and infection control.
- Provision of standard healthcare facilities and PPE: Adequate and functional healthcare infrastructure and consistent access to quality personal protective equipment (PPE) should be guaranteed. A safe and supportive work environment reduces risk perception and perceived vulnerability to disease and reassures healthcare workers of their value and protection.
- Learning from past outbreaks: Structured training that integrates lessons learned from previous outbreaks (such as Ebola and COVID-19) should be institutionalized. Regular evaluation and simulation exercises can help healthcare workers build readiness and confidence for future public health emergencies.
- Strengthening organizational fairness: Beyond physical resources, healthcare organizations should prioritize transparent communication, fair treatment, trust, and supportive leadership.

9. Limitation

This study is not without limitations. The cross-sectional design restricts the ability to draw causal inferences; longitudinal studies are recommended to understand better how socio-cognitive factors and effort-related behaviours evolve during an outbreak. Also, participants' responses may have been influenced by response bias, leading to potential underreporting or overreporting, therefore, generalizations should be made cautiously.

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