

Predicting nurses' safety compliance behaviour in a developing economy, using the theory of planned behaviour: A configurational approach

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Abstract

Aim: The study's main objective was to use a fuzzy set qualitative comparative analysis to identify the configuration of recipes that predict nurses' safety compliance behaviour.

Design: A cross-sectional design.

Methods: A survey was used where questionnaires were collected from 285 nurses across four primary healthcare hospitals within the Ashanti Region, Ghana. The data collection happened between June 1 to August 2, 2022. A fuzzy set qualitative comparative analysis was used to identify the recipes of psychological factors that determine nurses' safety compliance behaviour.

Results: Results from the study suggest that the necessary configurations that explained nurses' safety compliance behaviour came from the presence of subjective norm, attitude, perceived behavioural control, perceived organizational support and negation of intention. The result highlights the need for safety protocols to be conscious of the interplay between nurses' assessment of self, social clues and perception of management care and support since such psychological factors must be considered concurrently to achieve the optimal safety compliance behaviour among nurses.

Conclusion: A health and safety protocol that fails to recognize the importance of psychological antecedents on subordinates' safety compliance behaviour could limit the safety policy's usefulness in bringing the appropriate behavioural change in nurses.

Impact: To date, no study has combined the antecedents of theory planned behaviour with perceived organizational support and cue to action to assess how they collectively predict nurses' safety compliance behaviour. Findings from the study suggest that nurses in primary health facilities inform their safety compliance behaviour by assessing self-capabilities, social signals from superiors and colleagues and perception of management support. Hospital administrators and nursing managers in sub-Saharan Africa may rely on these psychological forces to persuade nurses to develop positive safety compliance behaviour at the health facility.

Patient or Public Contribution: No Patient or Public Contribution.

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KEYWORDS

configurational approach, cue to action, fsQCA, nurses, perceived organizational support, safety compliance behaviour, theory of planned behaviour

1 | INTRODUCTION

Healthcare worker (HCW) workplace injuries and fatalities come with immense human and financial losses, affecting health facilities' ability to provide patients with the needed care (World Health Organization, 2020). Since nurses are the principal caregivers in the health service, they are most susceptible to biological, chemical, physical, and ergonomic occupational hazards (World Health Organization, 2018). Globally, as many as 3 million nurses are exposed to one form of injury or fatality when discharging their assigned roles at the health facility (Dressner & Kissinger, 2018). Nurses' fatalities and injuries are substantially higher in low-and middle-income countries (LMICs) because of poor safety measures, workers' attitudes, and poor infrastructural designs (Onigbinde et al., 2020). For instance, regional reports suggest that nurses, especially those in sub-Saharan Africa, are at high risk of contagions stemming from blood-borne pathogens such as Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and human immunodeficiency virus (HIV) (Mengistu & Tolera, 2020).

In understanding nurses' workplace safety performance, the standard procedure, but an out-of-date assessment proxy, has been to gauge nurses' workplace safety as the absence or presence of accidents (Al-Bsheish et al., 2019). This suggests that a higher occurrence of injuries will mean poor workplace safety, whereas a minor event of fatalities will signify adequate workplace safety (Hinze et al., 2013). However, a more robust contemporary perspective argues that the absence of workplace fatalities does not essentially affirm evidence of workplace safety (Beus et al., 2016), as nurses' workplace safety behaviours manifest first before the accident (Zohar, 2014). Recently, safety-related work behaviours have been identified to provide a more precise assessment of nurses' workplace safety because they can be used to establish both the absence and presence of safety (Beus et al., 2016). Therefore, safety performance, as revealed through safety behaviours, is viewed as a primary parameter for workplace safety because fatalities are not a true reflection of safety, as they only mirror the absence and presence of safety post a loss or injuries.

Safety performance which becomes a core precursor of safety outcomes emerges from these main dimensions, safety compliance and safety participation (Petitta et al., 2017), whereas safety participation involves discretionary behaviours such as assisting colleagues to improve safety issues at the workplace, safety compliance constitutes the central adherence connected with actions required to preserve workplace safety, for example, wearing personal protective gear, following the laydown procedures and adhering to organizational safety culture (Neal et al., 2000). Safety compliance is stipulated in an employee's job description (Neal et al., 2000).

Yet, among these safety performance dimensions, safety compliance is identified to have the most significant impact on organizational safety outcomes (Nahrgang et al., 2011). In their meta-analysis, Nahrgang et al. (2011) observed a meaningful relationship between safety compliance and safety outcomes such as workplace accidents and injuries and other adverse safety-related events. Occasionally, studies have assessed safety behaviour or performance as an antecedent of safety compliance and safety participation or separately in certain instances (Griffin & Neal, 2000; Leung et al., 2014; Guo et al., 2016). However, because safety compliance has reported a more substantial predictive effect on safety behaviour (Petitta et al., 2017), we focused more on safety compliance as our central safety performance construct of interest.

Even though Ghana, at the national level, is pushing aggressively to achieve the World Health Organization's Global Patient Safety Action, the impact of the policy at the regional and district level does not seem very encouraging (World Health Organization, 2021). A district-level analysis done in the study of Appiagyeyi et al. (2021) indicates that most nurses within the country's primary healthcare facilities are undermining the safety measures instituted by the Ministry of Health. Nurses' resistance to the recommended safety procedures seems to be more than just a Ghanaian phenomenon. Studies in other sub-Saharan African countries observed poor safety compliance behaviour among nurses in Nigeria, Sierra Leone, Uganda, and the Gambia (Ndejjo et al., 2015; Nkereuwem et al., 2021). In sub-Saharan Africa, nurses' poor safety compliance behaviour has increased calls for studies to delve deeper into the psychological issues that can predict nurses' safety compliance behaviour, as earlier studies have overlooked this area. Therefore, understanding how psychological factors can positively strengthen nurses' safety compliance behaviour is essential to minimize work-related injuries and incidents at healthcare facilities (Han et al., 2019).

2 | BACKGROUND

Although the extant literature has highlighted the impact of individual and institutional factors (e.g., training, provision of personal protective equipment and policies) on health workers' safety compliance behaviour, it has still failed to account for the underlying psychological factors that predict nurses' safety compliance behaviour (Zhou et al., 2020). Per the theory of planned behaviour (TPB), other psychological issues, such as perceived behavioural control, social norm, and attitude, are crucial to predicting an individual's safety compliance behaviour (Mossburg et al., 2019). Undeniably, the impacts of these psychological factors on individual safety compliance behaviour have been well explored in high-risk industries such as oil and gas, the construction sector, transportation, and manufacturing

factories (Nævestad et al., 2018); the impact of these psychological issues on nurse's safety compliance behaviour remains less understood (Moda et al., 2021).

Considering the significant impact psychological factors have on individual current and future behaviour, the study draws its theoretical foundation from the theory of planned behaviour (TPB) to examine the antecedents of nurses' safety compliance behaviour in a developing economy. TPB remains one of the dominant psychological theories exploring how attitudinal, normative and control beliefs concurrently predict individual intention and behaviour towards a particular course of action (Ajzen, 1991). Despite TPB's validity across several fields, it has yet to be widely used in the nursing literature to assess nurses' safety compliance behaviour (Dionisi et al., 2020).

Additionally, the study applied a configurational approach for data analysis due to the TPB theory limitation in accounting for unsolved variance in behavioural outcomes (Yuriev et al., 2020). Most TPB studies used symmetrical methods such as regression, covariance, and partial least square structural equation modelling for their analysis. Considering that most of these symmetrical approaches failed to account for unresolved variances and contrarian consequences, it limited the validity of most TPB research outcomes (Khalid et al., 2022). Therefore, the study adopted a configuration approach, a fuzzy set qualitative comparative analysis (fsQCA), in response to the call for new TPB studies to adopt a more robust analytical method.

Again, to account for the unexplained variance in TPB, we theorized that nurses' safety compliance behaviour could be better explained by their perception of how their organizations value their contributions (Eisenberger et al., 1990). Per the antecedents of the organizational support theory and the norm of reciprocity, perceived organizational support (POS) inspires workers to be interested in the organization's values and strive to accomplish its objectives (Eisenberger et al., 1990). Therefore, as an add-on resource, POS can produce a sequence of positive emotional perceptions and experiences at the workplace and consequently shape nurses' safety compliance behaviour (Riggle et al., 2009). Although the extant literature recognizes that a positive POS serves as an effective defensive instrument against workplace disasters and employees' resistance to organizational compliance (Labrague & De los Santos, 2020; Veenema et al., 2017), they provide little evidence on why and how POS could interact with TPB to impact nurses' safety compliance behaviour. Since the absence of POS increases employees' stressors, job dissatisfaction and burnout, it becomes crucial to explore the interplay between POS and TPB's antecedents and understand how they interact to predict nurses' safety compliance behaviour (Kurtessis et al., 2017).

Additionally, nurses' safety compliance behaviour will depend on other latent conditions, such as cues to action, triggers, and values (Isaacs et al., 2021; Razak et al., 2020). From the health belief model (HBM), a person's predisposition towards a condition emanates from their earlier knowledge and experiences about the negative consequences of that same condition (Ng & Lucianetti, 2016). In principle,

nurses should be more driven to comply with the prescribed health and safety protocols when triggers consistently prompt them to perform specified actions. It implies that knowledge alone may not sufficiently inform an individual's safety compliance behaviour. Instead, a previous individual awareness about an adverse outcome of poor safety compliance behaviour from either self or colleague could determine a nurse's future safety compliance behaviour (Jensen & Moser, 2008). We therefore theorized that a nurse's prior awareness of the dangers of non-compliance could predict their future safety compliance behaviour.

Surprisingly, most earlier studies have ignored the impact of this earlier negative consequence on health workers' safety compliance behaviour, as the emphasis has often been on individual knowledge and awareness. Recognizing the complementary properties of TPB and HBM, some scholars have begun adjoining them to clarify better and explain individual behavioural outcomes (Poss, 2001; Wang et al., 2019). Therefore, the integration of the HBM and TPB is not new in the extant literature and has been shown to provide a better perspective on health and safety-related behaviour, such as adolescent screening for breast cancer and vaccine acceptance, helmet usage among motorcyclists and injury prevention at the workplace (Gabriel et al., 2019; Poss, 2001; Wang et al., 2019). We, therefore, argue that adjoining cues to action from the HBM with all the constructs of TPB in a single study would provide a comprehensive understanding of the combination of psychological factors that strengthen nurses' safety compliance behaviour. Using Ghanaian primary healthcare facilities as the study site, we use a configurational approach to identify the recipe of configurations that determine nurses' safety compliance behaviour. Even though a significant investment has been made in Ghana's healthcare sector concerning infrastructure and personnel development, the fatalities and injuries among nurses in primary healthcare centres are still not encouraging (Appiagyeyi et al., 2021). Because HCWs' safety compliance behaviours are relatively low at the primary healthcare facilities, exploring the antecedents of nurses' safety compliance behaviour at these facilities will be crucial to inform new safety policy developments and implementation at the national and local levels. A summary of the primary psychological constructs underpinning the study is displayed in [Figure 1](#).

3 | STUDY

3.1 | Aims

The study's main aim was to assess the influence of psychological factors on nurses' safety compliance behaviour.

3.2 | Design

The study used a cross-sectional design. The decision to use a cross-sectional design was informed by the fact that the study had to

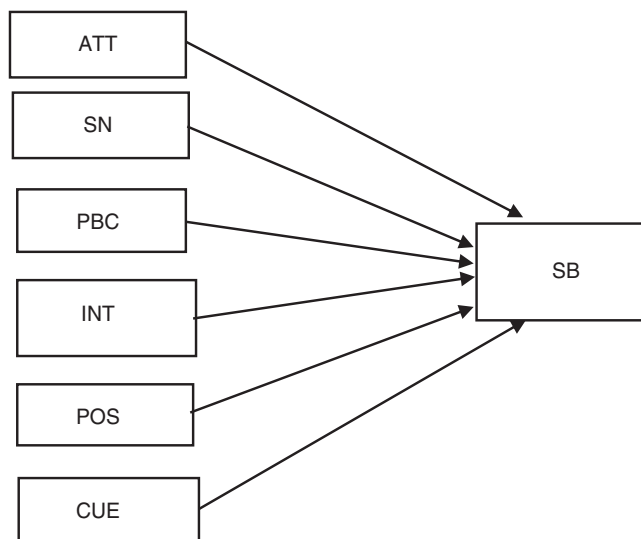


FIGURE 1 Conceptual model. ATT, attitude; CUE, cue to action; INT, intention; PBC, perceived behavioural control; POS, perceived organizational support; SB, safety compliance behaviour; SN, subjective norm.

collect the same data from a large pool of nurses within the Ashanti Region of Ghana (Bryman, 2016).

3.3 | Sample/Participants

Ghana's health care system functions on a 3-tier system: primary, secondary, and tertiary. Because primary health facilities become patients' first point of contact, HCWs are often overwhelmed with many patients. The high rate of patients at primary healthcare centres aggravates nurses' burnouts and stressors, increasing their exposure to various hazards. Looking at the importance of primary healthcare services in Ghana's healthcare delivery, four primary and secondary hospitals in Ashanti Region, Ghana were selected as the study cases. For purposes of anonymity, the names of the hospitals have been concealed in alphabetical order, A, B, C, and D. Hospital A is a district hospital and provides health care services for the Bantama sub-metro district in Kumasi (the second largest city in Kumasi) and other communities. Hospital B has been recently upgraded from a health centre to a polyclinic and serves the people of Abuakwa North Municipality and other nearby environs. Hospital C serves the people in the southern part of the Ashanti Region, making it the first referral point for most primary hospitals in the southern part. Hospital D is the largest primary hospital in the Tafo municipality. Because of the proximity of these hospitals to urban towns, they have one of the country's highest patient occupancy rates. Therefore, using these hospitals as the study areas will improve the generalizability of the study conclusions to other hospitals in sub-Saharan Africa since the region has more primary and secondary-level hospitals than tertiary hospitals.

However, to identify the sample size required to produce an appropriate effect size, a priori power analysis was used to establish

the sample needed to obtain a medium effect size of 0.15 with a power of 0.90 and an alpha value of 0.05 (Memon et al., 2020). Since the study model had five predictors, a sample size of 138 was required to produce the medium effect size of 0.15. The expected sample size of 138 was far below the sample nurses as the study received 285 valid responses.

3.4 | Data collection

After receiving the ethical approval, introductory letters were sent to the hospital's medical superintendents detailing the purpose of the study and consequently seeking their consent. Afterwards, a short briefing was held with the potential participants explaining the purpose of the study and assuring them of complete anonymity. Again, we ensured the respondents could cancel participation anytime they felt uncomfortable continuing the survey. Four hundred and fifty (450) nurses agreed to participate, of which 320 were randomly selected. The questionnaires were sent to the nurses in person, and they were asked to complete them during their off day or break. A total of 285 valid response was retrieved, resulting in a response rate of 63.3%. The data collection occurred between June 1 to August 2, 2022.

The study adapted its measuring instruments from validated scales used in previous studies. Apart from the nurses' demographic profile, all the items were assessed on a five-point Likert scale (1=strongly disagree to 5=strongly agree). With the TPB scale, the study used all four sub-scales: attitude (ATT), subjective norm (SN), perceived behavioural control (PBC), and behaviour intention (INT). Specifically, for ATT construct, it was assessed with a three-item scale. A sample item was "following all health and safety protocols at this hospital is much safer." With SN, three-scale items of TPB were employed. A sample item was "colleague nurses will admire me if I do not follow through all safety protocols at this hospital." The study measured PBC with a five-item scale. An example of a sample item is "I have control over all the laid-down safety procedures in this hospital." With INT, it assessed the nurses' drive to engage in prescribed safety compliance behaviour. An example of a sample item includes "I am willing to follow all the safety protocols in every situation." The TPB scale usage has reported high reliability in most nursing studies, with their alpha values within the range of 0.64–0.81 (Sueyeon & Catherine, 2021; Via-Clavero et al., 2019). Obtaining an alpha value of >0.7 on all the TPB scales is consistent with the extent literature, where an alpha score of >0.60 has been recommended as the appropriate threshold to confirm the items' internal reliabilities (Ajzen, 2006; Francis et al., 2004). With POS, Eisenberger et al. (1986) eight-item scale was adapted to assess nurses' perception of how their hospitals value their inputs and care about their well-being. An example of a sample item includes "The hospital cares about my general satisfaction at work." Eisenberger et al. (1986) POS scale has reported high internal consistency in many behavioural studies with alpha values >0.8 (Choi et al., 2022; Wen et al., 2019). The alpha value on the POS scale was within this acceptable threshold, >0.9 confirming a high level of internal consistency. The last exogenous

variable, cues to action, constitutes reminders from numerous sources. The items were adapted from the study of Xiang et al. (2020). An example of a sample item includes "My personal experience with work injuries prompt me to perform safety compliance behaviour." The reported alpha score of >0.9 is in tandem with the alpha score of >0.7 reported in the studies of Gabriel et al. (2019) and Xiang et al. (2020). Lastly, the endogenous variable, safety compliance behaviour, comprises eleven items assessing nurses' safety compliance behaviour and performance. The safety compliance scale was adapted from Al-Bsheish et al. (2019) and Vinodkumar and Bhasi (2010). An example of the item used is "I report hazards recognizable hospital hazards to my immediate superior or manager." The scale alpha value of >0.7 is consistent with the alpha value reported in the study of Vinodkumar and Bhasi (2010).

3.5 | Ethical considerations

Before collecting data from the two (change to four to ensure consistency) participating hospitals, ethical clearance was obtained from the Tomas Bata University, Zlin, Ethics Committee and the University of Education, Ghana, Ethics Committee.

3.6 | Data analysis

As indicated earlier, most nursing studies relied extensively on symmetrical approaches for data analysis (Appiagyei et al., 2021; Li, Howell, & Cimiotti, 2023; Li, Wang, et al., 2023). However, as emerging evidence has begun to show a series of inconsistencies in the outcomes of these symmetrical approaches, particularly concerning its inability to identify negation outcomes (Pappas & Woodside, 2021), this study used a new methodological approach, fsQCA. fsQCA examines alternative models by merging several factors (i.e., causal recipes) to determine an outcome (Pappas & Woodside, 2021). For

instance, as a destination may be reached via several routes, a result may be achieved in several ways (Pappas & Woodside, 2021). fsQCA comprises three steps: data calibration, truth tabulation, and counterfactual analyses (Olya et al., 2020). At the calibration stage, following the suggestions of previous studies, the data was calibrated using three sets of conditions: full membership, crossover point, and full non-membership (Ragin, 2008). Following the extant literature, we used the percentile function in SPSS (Frequencies > Statistics > Percentile) to calibrate the data into the three recommended thresholds (Pappas & Woodside, 2021). The results of the data calibration are presented in Table 1. After the calibration, the next step was the truth table, which comprises a list of all likely conditions that predict an outcome (i.e., nurses' safety compliance behaviour). Subsequently, we reduced the truth table into conditions that resulted in better development (Pappas & Woodside, 2021) by defining the frequency cut-off at >1 (Ragin, 2008). Furthermore, the causal combinations were refined based on coverage and consistency indicators comparable to coefficient determination and correlation coefficient in MRA (Mehran & Olya, 2020). Finally, we computed the necessary conditions to identify the recipes to predict nurses' safety compliance behaviour (Mehran & Olya, 2020).

3.7 | Validity, reliability and rigour

For the measurement validation, the traditional measurement indicators, convergent validity, discriminant validity, and construct validity, were used (Hair et al., 2019). Specifically, on the scales' convergent validity, Table 2 suggests that the items' Average variance extract (AVE) and factor loadings were within the recommended value range of 0.7 for factor loadings and 0.5 for AVE (Benitez et al., 2020). Except for two SN items, all other scale factor loadings surpassed the recommended threshold of 0.7. The composite reliability (CR) measure assessed the scale's reliabilities. Guided by the recommendations of Hair

TABLE 1 Data calibration.

Construct	Full non-membership score	Crossover point	Full membership score
ATT	2.00	3.00	5.00
SN	1.00	4.00	5.00
INT	1.00	3.00	5.00
PBC	2.00	4.00	5.00
SB	1.00	3.00	5.00
POS	2.00	3.00	5.00
CUE	1.00	3.00	5.00
Respondents age, binary condition; 1 = 21–30 years, 2 = 31–40 years	No need for calibration		
Years of nursing experience; binary condition; 1 = 1–5 years, 2 = 6–10 years	No need for calibration		

Abbreviations: ATT, attitude; CUE, cue to action; INT, intention; PBC, perceived behavioural control; POS, perceived organizational support; SB, safety compliance behaviour; SN, subjective norm.

TABLE 2 Constructs of indicators and measurements.

Constructs	Alpha	Rho_A	AVE	CR	Mean	SD	Factor loading
Attitude	0.810	0.835	0.565	0.865			
Following all health and safety protocols at this hospital is much safer.					3.84	1.018	0.850
Following all the safety protocols lowers my productivity.					3.65	1.638	0.909
Safety precautionary measures are too far away for me to follow.					4.02	1.122	0.813
Perceived behaviour control	0.833	0.919	0.654	0.861			
I know which safety precautionary measures to use When performing an assigned task.					4.46	1.027	0.925
I have control over all the laid-down safety procedures in this hospital.					3.95	.848	0.898
I have no difficulty applying a safety protocol.					4.01	.848	0.918
Subjective norm	0.742	0.870	0.786	0.880			
My immediate supervisor will think I am slow if I use all safety protocols.					3.96	1.122	0.757
My superior reminds me about following the safety protocols when I do not use them.					3.87	1.366	0.885
My colleague reminds me about using a safety protocol when I fail to use it.					3.85	1.672	0.609
Colleague nurses will think I am slow if I follow all safety protocols.					3.81	1.428	0.795
Colleague nurses will admire me if I do not follow all safety protocols.					3.75	0.817	0.592
Intention	0.816	0.841	0.651	0.880			
I will follow all the safety measures when I return to work.					4.19	1.325	0.823
I am willing to follow all the safety protocols in every situation.					3.86	1.144	0.826
Going by my hospital safety rules will ensure my safety.					4.28	1.210	0.793
Putting on the recommended PPEs (like boots, gloves, and gowns) will protect me against potential injuries.					4.15	1.027	0.721
Perceived organizational support	0.992	0.993	0.992	0.883			
The hospital I work is interested in my views.					2.51	.882	0.951
The hospital I work with is interested in my general well-being.					3.04	1.074	0.975
The hospital I work with values my extra effort.					3.27	1.066	0.944
The hospital usually ignores my complaint.					3.16	1.173	0.908
Even if I did the best job possible, the hospital would intentionally fail to recognize me.					2.51	1.070	0.932
The hospital cares about my general satisfaction at work.					3.27	1.072	0.958
The hospital shows very little concern for me.					3.41	1.382	0.942
The hospital I work with takes pride in my activities at work.					3.11	1.144	0.896
Cue to action	0.987	0.988	0.988	0.816			
Colleague nurses prompt me to perform the necessary safety precaution.					3.69	0.817	0.922
Hospital campaigns such as media, press, posters or e-mails always prompt me to adhere to safety measures.					4.06	1.260	0.866
My personal experience with work injuries reminds me to comply with safety protocols.					4.09	1.394	0.943

TABLE 2 (Continued)

Constructs	Alpha	Rho_A	AVE	CR	Mean	SD	Factor loading
Weighty referents with hospital injuries prompt me to comply with all necessary safety protocols.					4.12	.851	0.927
Safety behaviour	0.979	0.984	0.872	0.982			
I examine my tasks for potential hazards before undertaking them.					4.46	1.027	0.659
I refuse to work if the risk of an accident is extremely high.					4.43	.848	0.640
I care about the safety of other nurses and act to ensure their safety at the hospital.					3.71	.848	0.879
I report hazards recognizable hospital hazards to my immediate superior or manager.					4.39	1.126	0.954
I listen attentively to all safety inductions or training.					4.39	1.110	0.943
I always wear personal protective equipment given to me.					4.06	1.281	0.957
I take precautions when working to avoid accidents.					4.30	1.173	0.923
I avoid taking shortcuts because of the danger involved.					3.89	1.169	0.954
I properly discharge off sterile surgical gloves and gowns.					3.94	1.144	0.970
I properly dispose of surgical waste on suitable labels.					3.72	1.187	0.896
At all times, I follow through with all hygiene practices, such as antiseptic hand washing and proper instrument sterilization.					4.14	1.038	0.871

Note: Bolded are the reliability and validity checks. Unbolded are central tendency measure.

et al. (2019), the scales obtained acceptable reliability as all CR values were higher than 0.8 (Table 2). With discriminant validity, the recently recommended heterotrait-monotrait (HTMT) was used. According to the HTMT criterion, a study satisfies the condition of discriminant validity when all its construct values are lesser than 0.85 (Henseler et al., 2015). Table 3 results confirm that the construct values are below the recommended threshold of 0.85 (Henseler et al., 2015). Lastly, the data were subjected to the common method bias (CMB) test as a survey constituted the primary means of data collection. According to Podsakoff et al. (2003), the presence of CMB in a self-reported survey could reduce the accuracy and reliability of a study's conclusion. To address the issue of CMB, the highly recommended Harman single-factor test was performed on the data. With this statistical procedure, the total variance explained by a single factor component stood at 41.4%, lower than the 50% recommended threshold (Podsakoff et al., 2003). The result indicates that CMB was not a serious issue to be worried about in this study.

4 | RESULTS

4.1 | Sample description

Results in Table 4 indicate that the nurses had a mean age of 25.2 years. Additionally, most of the nurses were females (69.7%), single/unmarried (59.1%), and had a diploma in nursing education (78.2%). In their job position, most nurses were employed as junior nurses (67.1%), affirming the nurses' current academic qualifications.

Regarding the descriptive statistics of the primary constructs (Table 2), ATT item mean values were within the range of 3.65–4.02, signifying an agreed rating among the respondents. All its mean values for SN were within 3.75–3.96, suggesting an approved rating. The mean scores for the INT construct were above 3.86, indicating an agreed rating among the respondents. For PBC, its items' mean values were 3.95–4.46, hinting that the respondents' ratings were within the approved rating. With POS, its items' mean values fall between 2.51–3.41, suggesting an undecided positioning. The mean values for CUE were within 3.69–4.12, signifying an agreed rating. Lastly, SB mean values were above 3.7, indicating an approved rating among the respondents.

4.2 | Configurational results

With each pathway, consistency and overall coverage are presented. The consistency value is analogous to the correlation coefficient in symmetrical analysis. At the same time, the coverage index is equivalent to the R square estimation in structural equation modelling and multiple regression analysis (Fang et al., 2016). Except for model 1, the consistency of the overall solution was higher than 0.8 (Table 5), confirming a high level of consistency (Ragin, 2008). Three equifinal configurations regarding the psychological factors determining nurse safety compliance behaviour were identified. The consistency value signifying the extent to which a recipe produces an outcome is greater than the suggested threshold of 0.8 (Ragin, 2008). The overall solution coverage for the factors accounting for nurse safety

TABLE 3 Heterotrait-monotrait ratio (HTMT).

	ATT	SN	PBC	INT	POS	CUE	SB
ATT							
SN	0.769						
PBC	0.460	0.404					
INT	0.588	0.500	0.151				
POS	0.713	0.518	0.510	0.631			
CUE	0.840	0.726	0.739	0.790	0.713		
SB	0.845	0.854	0.768	0.800	0.586	0.842	

Abbreviations: ATT, attitude; CUE, cue to action; INT, intention; PBC, perceived behavioural control; POS, perceived organizational support; SB, safety compliance behaviour; SN, subjective norm.

TABLE 4 Demographic profile.

Demographic variable	Category	Frequency	Per cent
Gender	Male	86	30.2%
	Female	199	69.8%
Age	21–30 years	205	71.9%
	31–40 years	80	28.1%
Marital status	Single	168	58.9%
	Married	117	41.1%
Job Status	Junior nurse	191	67.1%
	Senior nurse	94	32.9%
Education	Diploma	223	78.2%
	Bachelor's degree	62	21.8%
Number of years they have been in the nursing profession	1–5 years	170	59.6%
	6–10 years	115	40.4%

compliance behaviour was 0.89, confirming the sufficiencies of these social cognitive factors (Ragin, 2008).

Based on the recipes that accounted for nurse safety compliance behaviour, solution 1 (Model 1), subjective norm, perceived behavioural control, perceived organizational support, cue to action, and the negation of intention constituted the recipes that explained nurse safety compliance behaviour ($SN * PBC * POS * CUE \sim INT$) (Table 5). The results suggest that psychological conditions such as subjective norm, perceived behavioural control, perceived organizational support, cue to action, and negation of intention were crucial in compelling a nurse to comply with the prescribed safety protocols.

With the second solution (Model 2), the recipes that predicted nurses' safety compliance behaviour came from the presence of attitude, subjective norm, perceived organizational support and the absence of cue to action and perceived behavioural control ($ATT * SN * POS \sim CUE \sim PBC$) (Table 5). The second configuration is comparable to Model 1, only that attitude and negation of perceived organizational support were present. The result suggests that a positive attitude and subjective norm originating from the external

environment (i.e., colleagues and superiors) and perceived organizational support influence nurse adherence to safety protocols.

The study examined further how the demographic profiles of nurses combined with the antecedents of TPB, POS, and cue to action to predict nurses' safety compliance behaviour. With this, Model 3 suggests that the presence of attitudes, presence of subjective norms, presence of perceived behaviour control, absence of intention, presence of perceived organizational support and cue to action, lack of age, presence of academic qualification, and years of working experience determined nurses' safety compliance behaviour ($ATT * SN * PBC * \sim INT * POS * CUE \sim Ag * Years \text{ of working experience} * Education$) (Table 5). Recording the presence of attitudes, subjective norms, and perceived organizational support in all four recipes implied that these psychological factors constituted the necessary conditions to improve nurses' safety compliance behaviour (Ragin, 2008). The result suggests that although perceived behaviour, control, intention, and cue to action are sufficient conditions, more is needed to determine nurses' safety compliance behaviour. For instance, without POS, nurses are likely to feel that their superiors and hospitals care less about them and their contributions. This negative perception of betrayal may aggravate nurses' job stressors and reduce their attentiveness towards the prescribed health and safety measures.

Also, because of the underlying asymmetry properties of fsQCA, it accounted for the negation of an outcome that most symmetrical analyses fail to produce (Rihoux & Ragin, 2009). Two equifinal configurations were identified for the antecedents that predicted the negation of nurses' safety compliance behaviour. With the first solution (Model 1), the presence of perceived behavioural control, cue to action, absence of subjective norm, absence of perceived organizational support, and regardless of attitude and intention failed to influence the nurse's safety compliance behaviour ($PBC * CUE * \sim SN * \sim POS \sim ATT \sim INT$) (Table 5). With solution 2 (Model 2), the presence of attitude, absence of subjective norms, absence of perceived behavioural control, presence of intention and absence of perceived organizational support and cue to action failed to predict nurses' safety compliance behaviour ($ATT * \sim SN * \sim PBC * \sim POS * \sim CUE * INT$) (Table 5). The results suggest that the presence of attitude and intention may not be adequate to determine nurses' safety compliance behaviour.

TABLE 5 Causal configurations for the presence and absence of (~) safety behaviour.

Configurations	Raw coverage	Unique coverage	Consistency
Models for predicting safety compliance behaviour			
M1. SB=f (SN, PBC, POS, CUE, INT)			
SN*PBC*POS*CUE~INT	0.593	0.170	0.878
Solution coverage: 0.893			
Solution consistency: 0.6870			
M2. SB=f (ATT, SN, CUE, PBC)			
ATT*SN*POS~CUE~PBC	0.440	0.049	0.941
Solution coverage: 0.93			
Solution consistency: 0.94			
M3. SB=f (Ag, Exp, Edu, ATT, SN, PBC, INT, POS, CUE)			
ATT*SN*PBC~INT*POS*CUE~Ag*Exp*Edu	0.586	0.173	0.882
Solution coverage: 0.94			
Solution consistency: 0.84			
Models for predicting negation of safety compliance behaviour			
M4. ~SB=f (PBC, CUE, SN, POS, ATT, INT)			
PBC*CUE*~SN~POS~ATT~INT	0.99	0.96	0.996
Solution coverage: 0.99			
Solution consistency: 0.57			
M5. ~SB=f (ATT, SN, PBC, POS)			
ATT*~SN~PBC~POS~CUE*Ag*Edu	0.167	0.044	0.95
Solution coverage: 0.512			
Solution consistency: 0.825			

Abbreviations: *, logical conjunction AND; ~, negation or absence; Ag, respondents age; ATT, attitude; CUE, cue to action; Edu, educational qualification; Exp, years of working experience; INT, intention; M1, model 1; M2, model 2; M3, model 3; M4, model 4; M5, model 5; PBC, perceived behavioural control; POS, perceived organizational support; SB, safety behaviour; SN, social norm.

Lastly, the analysis of the necessary conditions was computed to identify the configurations required to predict nurses' safety compliance behaviour (Table 6). Following the recommendations of Manosuthi et al. (2022) and Pappas and Woodside (2021), a condition whose consistency value exceeds the threshold of 0.9 is categorized as "necessary." Therefore, the results specify SN (consistency = 0.925, coverage = 0.886), PBC (consistency=0.912, coverage=0.872) and POS (consistency=0.915, coverage=0.687) as the primary psychological attributes that strengthen nurses' safety compliance behaviour. However, none of the absence conditions was deemed necessary because all their consistency scores were <0.9.

5 | DISCUSSION

The study is the first in a developing economy to apply TPB and other social antecedents (POS and cue to action) to predict nurses' safety compliance behaviour. Overall, the study findings provide a deeper insight into the psychological factors that predict nurses' safety regarding their compliance and non-adherence to prescribed safety protocols. Results from the study suggest that nurses informed their compliance with health and safety

TABLE 6 Necessary conditions analysis.

Conditions	Consistency	Coverage
INT	0.840	0.841
ATT	0.539	0.942
SN	0.925	0.886
PBC	0.912	0.875
POS	0.915	0.687
CUE	0.821	0.811
~INT	0.220	0.911
~ATT	0.588	0.907
~SN	0.401	0.923
~PBC	0.270	0.978
~POS	0.431	0.876
~CUE	0.129	0.991

Abbreviations: ATT, attitude; CUE, cue to action; INT, intention; PBC, perceived behavioural control; POS, perceived organizational support; SB, safety compliance behaviour; SN, subjective norm.

requirements from psychological and social perspectives. When strictly performing a clinical procedure, the participants were

worried about the pressures that emerged from their social circles (e.g., senior nurses and colleagues). Also, the participant's compliance with the hospital protocols was not only induced by these social forces, but a significant part of their compliance arose from within (e.g., attitude and perceived behavioural control). The result is consistent with Edelson et al. (2009) perspective, as they posit that an individual safety attitude occurs directly from three motivational foundations: motivation for safety, convenience, and comfort. Therefore, nurses' predisposition towards a particular motivational foundation will influence their safety compliance behaviour or actions. Notably, a nurse exhibiting more fondness for convenience will likely display low safety attitudes than a nurse with high safety motivation (La Barbera & Ajzen, 2020). Results from the study, therefore, demonstrate that a nurse's basis for safety, comfort, or convenience will inform their safety attitudes, and this attitude will consequently influence their safety compliance behaviour. Again, the participant's safety compliance behaviour was affected by a nurse's self-belief in their capability to perform or comply with a prescribed safety procedure. The study affirms the conclusion of the extant literature where attitudinal, normative and control beliefs such as attitude, subjective norms and perceived behaviour control become significant predictors of employee safety compliance behaviour, especially in hazardous industries (Nævestad et al., 2018).

Results from the study suggest that the social stimulus which emerges from a nurse's external environment (i.e., colleagues and superiors) and personal self (i.e., intentions and attitudes) plays a significant signal in nurse safety compliance behaviour (Zhang & Wu, 2014). Because junior nurses acquire their organizational cues from immediate supervisors and other experienced colleagues, their safety compliance behaviours tend to mirror what their close supervisors exhibit during the discharge of their duties (Efstathiou et al., 2011). The result suggests nurses always draw safety prompts from their superiors and institutional bodies (Ali et al., 2020; Enwereuzor et al., 2020; Fugas et al., 2012). Accordingly, when a nurse reveres such a social cue, it will likely compel them to behave in a certain way. Therefore, the desire to obey the norms of a social group will always persuade a nurse to follow the laid-down safety protocols (La Barbera & Ajzen, 2020). However, what is essential to this result is that the fsQCA analysis identified the presence of subjective norm, perceived behavioural control and perceived organizational support as the combination of recipes that influence nurses' safety compliance behaviour. The result implies that for the group pressures that emanate from the subjective norm to influence nurses' safety compliance behaviour, the nurses must have confidence in their capabilities (i.e., perceived behavioural control) to perform or comply with the required safety protocol. Without nurses' self-belief in their abilities to adequately perform the prescribed safety procedure, the desperation of desiring to be in the good books of colleagues or superiors will not lead to appropriate safety compliance behaviour.

The result highlights the need for safety protocols to be aware of the interplay between nurses' assessment of self, social clues,

and perception of management support since such psychological factors must be considered concurrently to achieve the optimal outcome. Accordingly, a health and safety protocol that fails to recognize the importance of psychological forces on subordinates' safety compliance behaviour could limit the safety policy's usefulness in bringing the appropriate behavioural change (La Barbera & Ajzen, 2020).

Nursing is one of the professions characterized by high employee job burnout and dissatisfaction. Since the primary health-care system becomes the first point of patient contact during sickness, nurses in this sector are often overburdened with much patient questioning and interaction. This occurrence aggravates their responsibilities and may limit the expected influence of psychological factors on nurses' safety compliance behaviour. The configurational analysis allowed us to explore the optimal combination of psychological conditions that translate into nurses' safety compliance and non-compliance to safety requirements, particularly in primary healthcare facilities. Given that limited studies have used configurational approaches to examine the interaction between these psychological factors and nurses' safety compliance behaviour in sub-Saharan Africa and advanced economies, our study contributes knowledge to the nursing literature by highlighting the optimal combination of psychological issues that leads to optimal nurses' safety compliance behaviour.

Nurses' safety compliance behaviour is complex; no social and psychological condition can independently translate into better safety outcomes. This study found that TPB antecedents cannot collectively predict nurses' safety compliance behaviour. Instead, by adding perceived organizational support as part of the determinants, we found that nurses' perceptions about how their hospitals or immediate supervisors valued their contributions and general well-being tremendously impacted their decision to work in unison with the hospital's safety goals. The results reinforce the importance of reciprocity in nurses' safety compliance behaviour. Their perception of how their hospitals cared about their work and well-being motivated them to be interested in the hospital's ideals and personal safety. The result is in tandem with previous work where a positive POS produces a self-protective mechanism against workplace disasters and hazards (Labrague & De los Santos, 2020). Because nurses in primary healthcare hospitals face many patients, they are most likely to be exhausted and discontented with their jobs, primarily when proper support systems are not provided to help them have a good work-life balance (Kurtessis et al., 2017). The result suggests that managers of hospitals and senior nurses can motivate nurses to comply with all safety protocols when they implement organizational resources to ease nurses' work overloads and improve their general well-being. Therefore, the positive emotional experiences produced by POS will complement the resources expended by emotional labour and may translate into high nurse satisfaction and proper safety compliance behaviour.

Also, results from the study revealed that signal to action, which comes directly from an internal (e.g., observation from a close environment) or external source (e.g., mass media campaign, adverse

effect on colleagues), forms part of the psychological factors that predicted nurses' safety compliance behaviour. Unlike the extant literature, where attention was always placed on positive cues of action (Isaacs et al., 2021), we theorized that a nurse's prior experience with the negative consequence of non-compliance could increase their disposition to comply with the prescribed health and safety protocols. The result from the study provides a different perspective to the extant literature by confirming that a nurse's earlier awareness about an adverse consequence of poor safety compliance behaviour from either self or colleague predicted their safety compliance behaviour. The result of the study has demonstrated that knowledge about safety protocols does not instinctively lead to better health outcomes (O'Toole et al., 2019). Instead, the fear of not experiencing that same adverse consequence a colleague nurse suffered from their non-adherence to safety protocols could significantly influence a nurse's present and future safety compliance behaviour. The result of the study suggests that hospital managers using negative imagery from a colleague's bad experience could be very helpful in inducing proper safety compliance behaviour among nurses.

Moreover, unlike symmetrical approaches that fail to explain the combinations of psychological factors that lead to the negation of nurses' safety compliance behaviour, with the fsQCA analysis, such contrarian outcomes were identified. For instance, it was established that the absence of subjective norms, perceived organizational support, attitude and, regardless of perceived behavioural intention and cue to action, did not influence nurses' safety compliance behaviour. Again, it was established that the presence of attitude, intention, absence of perceived behavioural control, perceived organizational support and regardless of cue to action failed to influence nurses' safety compliance behaviour. Results from the fsQCA analysis suggest that using only symmetrical approaches for TPB studies may be inadequate in accounting for the unexplained variances and contrarian outcomes reported in the extant literature (Khalid et al., 2022; Pappas & Woodside, 2021). Unlike the extant literature, where symmetrical approaches accounted for only direct and indirect effects, fsQCA identified the combination of psychological conditions that lead to the presence and negation of nurses' safety compliance behaviour. The study results indicate that the absence of attitude, intention, subjective norm, perceived behavioural control, perceived organizational support and regardless of the presence of cue to action resulted in nurses' non-compliance with their hospital's safety procedures (~ATT~INT~SN~PBC~POS*CUE). Results from the study expand the literature by responding to the calls for new studies to apply robust methodologies to understudy TPB's predictive effect on individual behaviour (Khalid et al., 2022). This result, therefore, confirms the relevance of the usage of the configurational approach in nursing studies.

5.1 | Strengths and limitations

Strengths characterize the current study. The first strength is that it adjoins additional psychological factors with TPB antecedents to explore better the determinants of nurses' safety compliance

behaviour in primary healthcare facilities in a developing economy. Second, it is the first to use a configuration approach in the nursing literature to provide two different perspectives on the combinations of factors that predict the presence and non-prediction of nurses' safety compliance behaviour.

While the study results provide important insight into improving nurses' safety compliance behaviour, it is still not without limitations. First and foremost, collecting data in a single episode may limit the study from making a more reliable inference about the expected relationship between social cognition and nurse safety compliance behaviour. Accordingly, to address this problem, future studies should use a longitudinal approach where data can be collected at two different times. Again, even though a priori and posterior measures were taken to limit common method bias, it is still possible that collecting both dependent and independent data from the same respondent may affect the study conclusion. Therefore, future studies should use a more robust procedure by collecting data from different sources to improve the study's validity. Lastly, this study collected data from two district hospitals in Ghana's Ashanti Region. Therefore, results from the survey can only be used within the study context.

6 | CONCLUSION

Results from the study revealed that nurses will always inform their safety compliance behaviour from themselves, social pressures, triggers from their immediate environment and their perception of how their employers care about their contributions and well-being. Our study substantiates the need for health managers and institutions to take a plurality perspective when instituting a safety policy or procedure to guide nurses' safety compliance behaviour. Managers and policymakers may only achieve nurses' full compliance with safety policy when the approach recognizes the impact of these psychological factors on individual behavioural outcomes.

AUTHOR CONTRIBUTIONS

Kwadwo Asante conceived the concept, and all authors had input into the study design. Kwadwo Asante was responsible for the data collection. Petr Novak secured funding and resources for the study. All authors discussed the results and contributed to writing the manuscript. The final manuscript was read and approved by all authors.

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CONFLICT OF INTEREST STATEMENT

None.

PEER REVIEW

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DATA AVAILABILITY STATEMENT

The dataset generated and analysed during the current study are not publicly available due to privacy or ethical restrictions but are available from the corresponding author upon reasonable request.

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