

# Enhancing Safety Reporting: The Relationships Among Motivation, Safety Climate, and Psychological Safety for Airport Employees in Thailand

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## Abstract

Safety reporting is not only necessary for responding to current safety concerns but also plays a vital role in proactively identifying and forecasting risks. It helps organizations take preventive measures to mitigate risks and enhance overall safety and security. Employees play a vital role in reporting safety. Understanding intrinsic and extrinsic motivation, safety climate in the organization, and psychological safety are crucial factors for reporting safety. The objectives of this research are to: (1) investigate the intrinsic motivation and extrinsic motivation, safety climate, and psychological safety on safety reporting among airport employees in Thailand; and (2) develop predictive equations for safety reporting behavior within aviation organizations. A sample of 500 employees was selected using a stratified random sampling method. Data were collected through questionnaires and analyzed using statistical measures such as frequency, percentage, mean,

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standard deviation, Pearson's Product Correlation, and stepwise multiple regression. The findings indicate that: (1) The four factors including intrinsic motivation, extrinsic motivation, safety climate, and psychological safety were related to the safety reporting of employees working at airports in Thailand at a significant level of 0.01, and (2) the equation that predicts the safety reporting of employees working at airports in Thailand was: safety reporting ( $\hat{Y}$ ) = 0.245( $X_1$ ) + 0.317( $X_2$ ) + 0.158( $X_3$ ) + 0.082( $X_4$ ),  $Z\hat{Y} = 0.231_{z_{x1}} + 0.294_{z_{x2}} + 0.184_{z_{x3}} + 0.107_{z_{x4}}$ ,  $R^2 = 0.389$ ,  $R^2$  Adjusted = 0.384 In conclusion, the study demonstrates the critical interplay between intrinsic motivation, extrinsic motivation, safety climate, and psychological safety in shaping effective safety reporting practices in Thailand's aviation sector. These elements are crucial for fostering effective safety reporting and enhancing the overall awareness and responsiveness of aviation organizations. The study suggests that to improve safety reporting in Thai aviation, organizations must cultivate employee intrinsic motivation, establish a positive safety climate, and reinforce psychological safety, guided by predictive models from the study.

**Keywords:** Intrinsic Motivation, Extrinsic Motivation, Safety Climate, Psychological Safety, Safety Report

## Introduction

A single accident can cause significant physical and mental harm, diminishing employees' well-being and contributing to work-related issues. Organizations strive to foster a safe and comfortable work environment by addressing occupational health and safety risks. To prevent, regulate, and mitigate these risks, active operator involvement is crucial for optimizing occupational health and safety performance. Safety is a fundamental need. According to Maslow's hierarchy of needs theory, safety needs rank second before higher needs (Maslow, 1998). Organizations must ensure basic safety needs for employees, similar

to how illness affects both the body and the mind. When individuals experience stress or discomfort at work, it impacts both their physical and mental health, as their safety behavior is influenced by what organizations provide (Zohar, 1980). Not only Psychological Safety is a crucial concept embraced by many organizations to encourages employees to experiment and collaborate, facilitating information sharing, problem-solving, and mutual support (A. Edmondson, 2018; A. C. Edmondson, 2018) but also safety climate is the actively encourage and cultivate a safety-oriented atmosphere in the workplace, coupled with fostering psychological safety within teams. Employees achieve this by providing comprehensive support across all facets linked to organizational safety. A perceived safe of employees workplace effect to attitudes towards their employers and organization (Bunner, Prem, & Korunka, 2021)

Self-determination theory refers to intrinsic motivation, driven by personal interests and desires, that leads to greater performance at work (Gerhart & Fang, 2015). To be associated with safety standard employee performance and proactivity within the organization, leaders must activate employees' internal motivation (Chua & Ayoko, 2021; Zhang & Liu, 2022) to increase long-term intrinsic motivation for safety. Employees driven by intrinsic motivation are linked to standard performance and proactive behavior (Parker, Bindl, & Strauss, 2010; Zhang & Liu, 2022). Furthermore, employee motivation is closely tied to employees' trust and confidence in their leaders, allowing them to feel like valued members of the team without the fear of ridicule, punishment, or exclusion for speaking up (Dekker & Edmondson, 2022; A. Edmondson, 2018). Self-Determination Theory (SDT) emphasizes the extent to which an individual's sense of initiative is influenced by social and cultural factors, alongside their well-being and performance quality (Ryan & Deci, 2000), and fulfils three psychological needs: autonomy, competence, and relatedness (Ryan, 1995)

(Ryan, 1995). Human needs offer insight into how environmental factors shape motivation (Deci & Ryan, 2008).

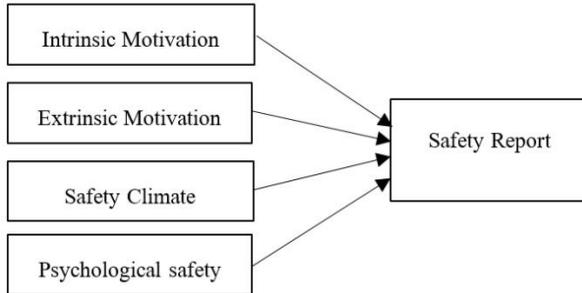
This research examines the role of motivation, including intrinsic and extrinsic elements alongside safety climate and psychological safety, in the context of safety reporting practices among aviation organizations. The study focused on employees at the Airports of Thailand Public Company Limited (AOT), which operates as the primary airport for international and domestic travel. According to the annual report of Airports of Thailand PLC for 2021, the airports under the supervision of AOT service the highest passenger and flight volumes in Thailand (CAAT, 2021). Furthermore, the study also encompasses other entities such as Bangkok Airways Airport, the Marine Department, and U-Tapao International Airport, which are significant contributors to Thailand's aviation industry. The selected airports provide a comprehensive view of national and regional aviation operations, drawing from a diverse pool of employees in varied roles and contexts. This variety substantially enhances the generalizability and relevance of the study's findings to Thailand's aviation sector.

## **Objective of the Study**

The primary objective of this study are entities as following;

- (1) To investigate the influence of motivation, safety climate, and psychological safety on safety reporting among airport employees in Thailand.
- (2) To develop predictive equations for safety reporting behavior within aviation organizations.

## Research Framework



The conceptual framework focused on how intrinsic and extrinsic motivation, safety climate, and psychological safety collectively shape the safety reporting of aviation employees. The hypotheses explore how these factors influence safety reporting within the aviation industry. Understanding and addressing these elements can cultivate a safety reporting culture that boosts proactive risk mitigation and contributes to heightened safety in aviation operations.

## Contributions of the Study

The importance of safety reporting within the aviation industry, specifically among airport employees in Thailand. There are the key contributions of this research:

1. The study delves into three critical factors—motivation, safety climate, and psychological safety—that significantly influence safety reporting. By examining these factors, the research provides valuable insights into what motivates employees to report safety concerns.

2. The study aims to develop predictive equations for understanding safety reporting behavior within aviation organizations. The research reveals significant findings. It identifies four factors within motivation, safety climate, and psychological safety that are related to safety reporting among employees working at airports in Thailand. These findings are statistically significant, providing concrete evidence of the factors that impact safety reporting.

3. The knowledge base of safety reporting in the aviation industry, offering practical insights and tools that can inform safety practices and policies in Thailand's aviation sector.

## **Literature Review**

### **Self-determination (SDT) Theory in safety reporting (Intrinsic and Extrinsic motivation)**

Self-Determination Theory (SDT), proposed by Deci and Ryan, underscores autonomy, competence, and relatedness for optimal well-being (Deci, Ryan, Deci, & Ryan, 1985). Satisfying these needs at work relates to positive outcomes: job satisfaction, engagement, commitment, and performance (Van den Broeck, Ferris, Chang, & Rosen, 2016). Employee silence can hinder communication, innovation, issue resolution, and information flow (Gencer, Atay, Gurdogan, & Colakoglu, 2023). Encouraging open communication is vital to fostering a healthy work environment and growth (Dehkharghani, Paul, Maharati, & Menzies, 2022; Deniz, Noyan, & Ertosun, 2013).

Intrinsic motivation involves pursuing inherently satisfying activities for their sake, driven by internal factors like interests and values. In contrast, extrinsic motivation stems from external rewards or societal expectations (Fishbach & Woolley, 2022). Intrinsic motivation, revolves around the fundamental psychological needs of autonomy, competence, and relatedness. These needs serve as pillars that underpin intrinsic motivation. Autonomy reflects control over behavior, competence seeks achievement and skill development, and relatedness

values social connections (Deci & Ryan, 2008). SDT distinguishes autonomous (intrinsic motivation) and controlled motivations (extrinsic motivation), emphasizing their understanding for promoting optimal functioning and well-being (Deci & Ryan, 2008). Intrinsic motivation can diminish silence, benefiting communication and well-being (Son, Yang, & Park, 2023).

Extrinsic motivation is driven external factors like rewards and societal pressures, prompting actions for specific goals even if they don't align with personal values (Deci & Ryan, 2012). It arises when individuals lack autonomy and are driven by external regulations (Deci, Olafsen, & Ryan, 2017). This type is driven by external stimuli, pursuing behaviors for rewards, but not personal satisfaction (Deci & Ryan, 2013) Self-determination theory categorizes motivation into six levels, ranging from non-regulation (amotivation) to intrinsic motivation. While intrinsic motivation is fully self-determined, identified regulation and integrated regulation are considered autonomous extrinsic motivations. Identified regulation reflects recognizing behavior's value, while integrated regulation aligns actions with personal values. Both involve choice and endorsement, making them more autonomous than less self-determined forms like external and introjected regulations (Deci & Ryan, 2013).

Therefore, the Self-Determination Theory (SDT) emphasizes autonomy, competence, and relatedness for well-being at work, leading to positive outcomes like job satisfaction and engagement. Encouraging open communication is vital to a healthy work environment. Intrinsic motivation stems from personal interests, while extrinsic motivation is driven by external rewards. Extrinsic motivation, specifically the type of identified regulation, involves acknowledging the value of a certain behavior. On the other hand, integrated regulation aligns actions with personal values. Both types entail choice and endorsement, establishing a higher degree of autonomy compared to less self-determined forms such as external and introjected

regulations (Deci & Ryan, 2013). SDT's pillars underpin intrinsic motivation, increasing the motivation and benefiting the communication of safety reports for well-being in organizations.

### **Safety climate and psychological safety in organization**

The safety climate is recognized as reliable and valid for aviation (Evans, Glendon, & Creed, 2007). Safety climate (SC) is a fundamental element of safety culture, offering a tangible representation of the organization's safety status that is quantifiable based on shared perceptions. This perception serves as a predictor for safety motivation and assessments of safety-related conduct (Cheyne, Cox, Oliver, & Tomás, 1998). that encompasses employees' collective awareness of safety procedures, policies, and practices within the working environment (Huang, Chen, & Grosch, 2010; Zohar, 1980). Employees perceiving a positive safety climate tend to adhere to safety practices, reducing occupational accidents (Syed-Yahya, Idris, & Noblet, 2022). Safe climate measurement as a bold prediction of safety outcomes, encompassing safety participation behaviors and compliance measures, including administrative and regulatory factors, training, resource support, reporting communication, risk management, safety information, and operational procedures (Reason, 1995). Safety climate holds significance as a key indicator of safety performance, allowing the prediction of safety behaviors and outcomes (Olsen, 2010). The safety climate serves as a valuable reference for decision-making and adaptive behavior, contributing to improved operational aspects (Schneider & Snyder, 1975). Strengthening safety climate and promoting employee interactions

are vital for encouraging safe behavior (Jiang, Yu, Li, & Li, 2010). A perceived safe workplace fosters positive attitudes among employees towards their employers (Bunner et al., 2021). Identifying gaps in employee and management perceptions through safety climate highlights necessary measures, policies, actions, and communication, enhancing performance (Schwatka & Rosecrance, 2016).

Psychological safety represents a shared belief within a workplace where individuals feel comfortable expressing themselves, take risks, and ask questions without fear of judgment or punishment. This environment, characterized by trust and respect, encourages authenticity. Psychological safety aspects, emphasizing that fear hinders motivation. Jobs necessitate learning and collaboration, but fear obstructs communication. This suppresses innovation and harms organizations (Edmondson, 1999). Thus, fostering psychological safety is vital. It amplifies intrinsic motivation's impact on safety reporting, while mitigating extrinsic motivation's negative effects (Sebire, Standage, & Vansteenkiste, 2009). Similarly, (Uysal & Yildirim, 2016) found that intrinsic motivation to engaging in inherently interesting activities, while (Frazier & Tupper, 2018) link extrinsic motivation to separable outcomes. Supervisor prosocial motivation and psychological safety relate positively to employee well-being and helping behaviors (Frazier & Tupper, 2018). Additionally, (Deng, Leung, Lam, & Huang, 2019) found that a psychological safety encourages learning and voice, reducing fear of failure while there is an active debate in psychology as to whether extrinsic rewards crowd out intrinsic motivation (Malek, Sarin, & Haon, 2020; Rebitzer & Taylor, 2011;

Wiersma, 1992). Promoting psychological safety within an organization is an effective way to encourage employees to report safety issues. Complex systems and excessive numerical data required to produce accurate cumulative information are susceptible to systematic error (Archer et al., 2020; Aydeniz, 2021). By analyzing safety climate and promoting psychological safety, organizations can identify gaps in perceptions and enhance safety performance and communication (Schwatka & Rosecrance, 2016). These concepts play pivotal roles in shaping organizational behavior, attitudes, and outcomes.

Thus, positive perceptions lead to better adherence to safety practices and reduced accidents. Psychological safety fosters open communication, trust, and authenticity, enhancing intrinsic motivation and mitigating negative extrinsic effects. These factors promote safety reporting and improve organizational performance by identifying gaps, enhancing safety, and shaping attitudes.

## **Reporting Behavior and Voluntary Safety Report**

Safety reporting is an important aspect that informs managers and other stakeholders about company safety performance. This information can be used to identify potential safety hazards and risks and develop mitigation strategies. Voluntary safety reporting conveys incidents, near-misses, training, equipment, and more. This proactive approach prevents accidents, enhances safety culture, and signifies a commitment to continuous improvement. Regular, accurate, and timely safety updates drive hazard identification and risk reduction, shaping a safer work

environment (ICAO, 2022). Establishing a reporting culture is not easy, especially when it requires individuals to admit to making mistakes. The Aviation Safety Reporting System (ASRS) supports the collection of data from aviation personnel, enhancing safety through publicizing information, improving standards, and preventing accidents via anonymous, voluntary reporting (O'Leary & Chappell, 1996; Under & Gerede, 2021). There are two primary reporting types: voluntary and mandatory. Voluntary reporting entails disclosing information to stakeholders without legal obligations, showcasing aspects like sustainability efforts. It builds trust, offers risk management, and highlights achievements, but demands accuracy and can have negative consequences if deemed inadequate. In contrast, mandatory reporting is legally required, ensuring transparency and accountability with penalties for non-disclosure. Voluntary reporting and mandatory reporting have some similarities but the key difference is that mandatory reporting is required by law or other regulatory frameworks, while voluntary reporting is done at the discretion of the company or individual (ICAO, 2022).

Accident underreporting occurs in environments where safety isn't prioritized or where supervisors inconsistently enforce safety regulations, impacting workplace safety and necessitating improvements (Probst & Estrada, 2010). Several factors influence safety climate and security enforcement, including inadequate training, communication, managerial prioritization, outcome-based rewards, insufficient commitment, cumbersome reporting, and unresponsive incident handling. These lead to underreporting due to employees' unawareness, perceived

lack of emphasis, fear of consequences, doubt in management commitment, and ineffective procedures, reflecting culture and effectiveness issues (Barbaranelli, Petitta, & Probst, 2015; Petitta, Probst, & Barbaranelli, 2017). Strong safety cultures with consistent safety practices discourage concealing accidents by supervisors, while positive safety climates mitigate underreporting (Barbaranelli et al., 2015).

## **Research Methodology**

This study employed a questionnaire to collect data from 500 airport employees and are involved in safety reporting and voluntary safety reporting who work under Airports in Thailand. The convenience sampling method was used to select employees from six Airports of Thailand Public Company Limited (AOT) as 1. Suvarnabhumi Airport (Bangkok Airport), 2. Don Mueang International Airport, 3. Phuket International Airport, 4. Chiang Mai International Airport, 5. Mae Fah Luang-Chiang Rai International Airport and 6. Hat Yai International Airport and Airports under responsibility of Bangkok Airways, Airports under responsibility of Marine Department, and airports under responsibility of U-Tapao International Airport as detailed in Table 1.

This study's sample selection was based on the Krejcie and Morgan model for determining sample size from a given population, ensuring that each airport's employee population was proportionately represented (Krejcie & Morgan, 1970). The study employed stratified random sampling, where the total population was divided into subpopulations based on the size airports. The number of participants from each airport was determined based on the proportion of employees at that airport relative to the total population across all airports. Table 1 shows that, the sample sizes were as follows: Suvarnabhumi Airport with 120 participants, Don Mueang International Airport with 100 participants, and a combined total of 210 participants

from Phuket International Airport, Chiang Mai International Airport, Mae Fah Luang-Chiang Rai International Airport, and Hat Yai International Airport. A further 70 participants were randomly selected from airports administered by Bangkok Airways, the Marine Department, and U-Tapao International Airport. By adhering to these stratified sampling principles, the study mitigates potential sampling bias and ensures that the findings can be generalized to the entire population of airport employees in Thailand.

**Table 1** The population selected in the study

<b>Airport Name</b>	<b>Sample Size</b>
1. Suvarnabhumi International Airport	120
2. Don Mueang International Airport	100
3. Phuket International Airport, Chiang Mai International Airport, Mae Fah Luang-Chiang Rai International Airport Hat Yai International Airport	210
4. Airports under Bangkok Airways, Airports under Marine Department, Airports under U-Tapao International Airport	70
<b>Total</b>	<b>500</b>

The research instruments used in this study include questionnaires designed to gather opinions and data from aviation employees. These questionnaires were developed and adapted from safety climate (Evans et al., 2007; Ghahramani & Khalkhali, 2015; Wen Lim, Li, Fang, & Wu, 2018), self-determination theory (Intrinsic and Extrinsic motivation) (Baard, Deci, & Ryan, 2004; Deci & Ryan, 2013), psychological safety (Edmondson, 1999) reporting (Flemons & McRae, 2012; Macrae, 2016) and ICAO Annex 13 – Objective of Aircraft Accident and Incident investigation in Voluntary and Mandatory Occurrence Reporting, (Blanthorne & Kaplan, 2008;

ICAO, 2013; Macrae, 2016; Probst & Estrada, 2010). The questionnaires underwent content validity checks by three qualified experts in aviation and were tested for reliability using Cronbach's method. This questionnaire achieved a Cronbach's alpha coefficient of 0.912 from 65 items. The questionnaire is divided into 4 sections, as follows:

**Part 1** General information related to airport employees at Airports in Thailand. This section covers gender, age, airport area, position, educational background, work experience, voluntary safety reporting experience, and years of work.

**Part 2** Safety climate and psychological safety in voluntary safety reporting, encompassing

**Part 3** Intrinsic and extrinsic motivation in reporting.

**Part 4** Safety reporting, including mandatory and voluntary reporting.

The respondents indicated their level of agreement with the measurement items using a five-point Likert scale. Responses ranged from 1 (strongly disagree) to 5 (strongly agree), with 3 (indecisive) indicating indecision. 500 individuals were eligible to participate in the research and voluntarily gave their consent to receive requests to take part in academic studies. Before collecting data, the researchers cooperate with the head of the airport standards and occupational health division of Chiang Rai, Thailand, to clarify and explain in detail to the coordinator the purpose of the survey and the questionnaire process, specifically six airports within AOT, Thailand and airports under responsibility of Bangkok Airways, Marine department and U-Tapao International Airport. The questionnaire was divided into two main data collection parts. The first part involved paper-based data collection at Mae Fah Luang International Airport, Chiang Rai, Chiang Mai International Airport, and Don Mueang International Airport. The second part involved online data collection via Google Form at Suvarnabhumi International Airport, Phuket International Airport, and Hat Yai International Airport. The researcher personally collected the data to ensure a comprehensive understanding of the questionnaire, and

for online data collection, a coordinator was available to provide explanations and support information. Participants can directly contact the researcher through the Line account for any inquiries.

The data analysis used in this study can be divided as follows: Part 1 focuses on collecting general information from 500 airport employees who are involved in safety reporting and voluntary safety reporting and work under Airports in Thailand. Descriptive statistics, including frequency and percentage, were utilized. Part 2, Part 3 and Part 4 examine safety climate, psychological safety, intrinsic motivation, extrinsic motivation in safety reporting within the workplace. Descriptive statistics, specifically the mean and standard deviation, were applied. Additionally, inferential statistics such as Pearson's Product Correlation and stepwise multiple regression analysis were conducted. The multiple regression analysis included 5 independent variables, each assigned a medium effect size, and a significance level of 0.01. The study employed a stratified random sampling method for data collection.

## **The Result of the Study**

1. Demographic characteristics of this study gender, age, airport area, position, educational background, work experience, voluntary safety reporting experience, and years of work found that the study's sample consisted of 500 individuals. In terms of gender, 301 (60.2%) were male and 199 (39.8%) were female. Across age groups, 5 participants (1.0%) were under 20, 118 (23.6%) were aged 20-29, 177 (35.4%) were 30-39, 128 (25.6%) were 40-49, 69 (13.8%) were 50-59, and 3 (0.6%) were 60 or older. Educationally, 46 (9.2%) held a diploma, 259 (51.8%) had a bachelor's, 177 (35.4%) had a master's, 4 (0.8%) had a Ph.D., and 14 (2.8%) had other education. In the aviation industry, 36 (7.2%) were air operators, 214 (42.8%) were public aerodrome operators, 12 (2.4%) were in air traffic management, 13 (2.6%) were in training organizations, 145 (29.0%) were in maintenance, 77 (15.4%) were

in organizational roles, and 3 (0.6%) were in communication system services. Affiliation-wise, 425 (85.0%) were with the Airport of Thailand (AOT), 20 (4.0%) with Bangkok Airways, 26 (5.2%) with the Marine Department, and 29 (5.8%) with U-Tapao International Airport. Regarding experience, 56 (11.2%) had <1 year, 21 (4.2%) had 1-2 years, 91 (18.2%) had 3-5 years, 111 (22.2%) had 6-10 years, and 221 (44.2%) had >10 years. For familiarity with Safety Management Systems (SMS), 434 (86.8%) responded yes, while 66 (13.2%) responded never.

2. The examination of data pertaining to Intrinsic motivation, Extrinsic motivation, Safety Climate, Psychological safety on team working, and safety reporting behavior among employees at Airports in Thailand revealed that an overview of statistical measures, namely mean ( $\bar{x}$ ) and standard deviation (SD), used to elucidate the perceptions among employees Airports in Thailand. Table 2 shows that, the mean scores for various factors are outlined: Safety Reporting is 3.90 (SD: 0.50), Intrinsic Motivation is 3.75 (SD: 0.47), Extrinsic Motivation is 4.16 (SD: 0.47), Safety Climate is 4.15 (SD: 0.58), and Psychological Safety is 3.30 (SD: 0.65). These measures offer insights into employees' opinions on safety motivation and team dynamics. The criteria for normality based on the image are that the absolute value of skewness should be less than 2 and the absolute value of kurtosis should be less than 2. For the variables in Table 2, all skewness values fall within the  $\pm 2$  range, indicating no significant skewness. Specifically, Safety Reporting (0.17), Intrinsic Motivation (0.45), Extrinsic Motivation (-0.82), Safety Climate (-0.78), and Psychological Safety (0.41) all demonstrate skewness values that suggest relatively symmetrical distributions. Similarly, all kurtosis values are within the  $\pm 2$  range. Safety Reporting (-0.09), Intrinsic Motivation (0.65), Extrinsic Motivation (1.13), Safety Climate (1.13), and Psychological Safety (0.40) suggest that the distributions are not significantly leptokurtic or platykurtic. Based on these

measures, we can infer that the distributions of the variables examined are approximately normally distributed, meeting the normality condition.

**Table 2** Mean ( $\bar{X}$ ) and standard deviation (SD) of employees at Airports in Thailand.

Variables	$\bar{X}$	SD	Minimum	Maximum	Skewness	Kurtosis
Safety	3.90	0.50	2.64	5	0.17	-0.09
Reporting						
Intrinsic	3.75	0.47	2.25	5	0.45	0.65
Motivation						
Extrinsic	4.16	0.47	2.00	5	-0.82	1.13
Motivation						
Safety	4.15	0.59	1.38	5	-0.78	1.13
climate						
Psychological	3.30	0.65	1.14	5	0.41	0.40
Safety						

3. Correlations Pearson Correlation presents relationships among variables: safety report exhibits strong positive correlations with intrinsic motivation (0.522) and extrinsic motivation (0.527), a moderate positive correlation with safety climate (0.452), and a weak positive correlation with psychological safety (0.286). Furthermore, safety report shows significant correlations with all other variables. Intrinsic motivation and extrinsic motivation are robustly correlated with each other and with safety report. safety climate demonstrates moderate correlations with intrinsic motivation and extrinsic motivation, and a weaker correlation with safety report. Lastly, psychological Safety displays weak correlations with all variables. Given these coefficients are significant at the 0.01 level, it suggests a high level of

confidence in these relationships, indicating that they are very unlikely to be due to random chance. This level of significance is generally considered strong in statistical analyses, pointing towards a meaningful relationship between the variables studied in the context of safety reporting in the aviation sector as shown in Table 3.

**Table 3** Correlations Pearson Correlation

Variables	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>
Safety Report (Y)	1.000	.522	.527	.452
Intrinsic Motivation (X <sub>1</sub> )	.522	1.000	.523	.483
Extrinsic Motivation (X <sub>2</sub> )	.527	.523	1.000	.500
Safety climate (X <sub>3</sub> )	.452	.483	.500	1.000
Psychological Safety (X <sub>4</sub> )	.286	.460	.194	.090

4. The summary of regression analysis model, the model's statistical measures are as follows: The correlation coefficient (R) is 0.624, which indicates the strength and direction of the linear relationship between the predictor variables (Intrinsic Motivation, Extrinsic Motivation, Safety climate, and Psychological Safety) and the outcome variable. The coefficient of determination (R<sup>2</sup>), representing the proportion of variance in the outcome variable that can be explained by the predictor variables. In this case, approximately 38.9% of the variability in the outcome variable is explained by the predictor variables. Adjusted R<sup>2</sup> represents similar to R<sup>2</sup>, but adjusted for the number of predictor variables in the model. It helps to account for potential overfitting. The adjusted R<sup>2</sup> is 0.384. Std. Error of the Estimate is a measure of the variability in the actual outcomes from the predicted outcomes. A lower value indicates a better fit of the model to the data. The model includes the predictors Intrinsic motivation, Extrinsic motivation, Safety climate, and Psychological Safety, as well as a

constant term. The predictors collectively contribute to explaining the variation in the outcome variable being analyzed. In the regression analysis model summarized in Table 4, the Adjusted R<sup>2</sup> is 0.384. This value adjusts the R<sup>2</sup> (0.389) for the number of predictors, providing a more accurate indication of the model's explanatory power while accounting for potential overfitting due to multiple variables. It suggests that about 38.4% of the variability in the outcome is explained by the predictors: Intrinsic Motivation, Extrinsic Motivation, Safety Climate, and Psychological Safety.

**Table 4** The summary of regression analysis model

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the Estimate
1	.624 <sup>a</sup>	.389	.384	.39479

a. Predictors: (Constant), Intrinsic Motivation, Extrinsic Motivation, Safety Climate, Psychological Safety

5. The regression analysis that found that the relationships between intrinsic motivation, Extrinsic motivation, safety climate, psychological safety, and safety reporting. The model's statistics show that the regression accounted for a significant portion of the variability in the dependent variable (Safety Reporting behaviors). The Regression provides information about the sum of squares, degrees of freedom, mean square, F-statistic, and its significance level (Sig.). These statistics collectively indicate the model's overall goodness of fit. The Residual represents the remaining unexplained variability. The total indicates the total variability in the dependent variable. The dependent variable is safety report, and the predictors used in the model are the constant term, intrinsic motivation, extrinsic motivation, safety climate, and psychological safety.

The significant values being less than 0.01 suggests that the combined predictors significantly explain the variance in safety reporting behaviors as shown in Table 5.

**Table 5** Multiple correlation coefficient and coefficients explain the relationships between Intrinsic Motivation, Extrinsic Motivation, Safety Climate, Psychological Safety, and Safety Reporting behaviors.

	<b>Model</b>	<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
1	Regression	49.161	4	12.290	78.855	.000*** <sup>b</sup>
	Residual	77.151	495	.156		
	Total	126.312	499			

\*\*\*p < .001

a. Dependent Variable: Safety Report,

b. Predictors: (Constant), Intrinsic Motivation, External Motivation, Safety Climate, Psychological Safety

6. The regression analysis, involves unstandardized and standardized coefficients, t-values, and significance levels for each predictor variable, aiming to understand their impact on the dependent variable. The dependent variable predicted, referred to as the safety report in each predictor variable (intrinsic motivation, extrinsic motivation, safety climate, psychological safety). Table 6 provides the following information: Unstandardized coefficients (B) indicate the expected change in the dependent variable for a one-unit change in the predictor variable while holding other variables constant. The standard error associated with the coefficient estimate Standardized coefficients (beta) are adjusted to have a standard deviation of one. They help compare the relative influence of predictor variables on the dependent variable. The t-value indicates the significance of the coefficient estimate. It is the ratio of the

coefficient to the standard error. The significance level (p-value) assesses whether the predictor variable has a statistically significant effect on the dependent variable. The correlations between the predictor variable and the dependent variable These values show the strength and direction of the relationship. Collinearity statistics help assess potential multicollinearity issues among predictor variables. Zero-order Correlation between the predictor variable and the dependent variable without accounting for other predictors. Partial Correlation between the predictor variable and the dependent variable while controlling for other predictor variables. Part Tolerance is the variance in a predictor variable that isn't predictable from other predictors. VIF (variance inflation factor) is a measure of multicollinearity; values greater than 1 indicate possible multicollinearity issues. The findings suggest that all predictor variables— intrinsic motivation, extrinsic motivation, safety climate, and psychological safety— have statistically significant impacts on the dependent variable safety report. The standardized coefficients (Beta) offer insights into the relative strength of these impacts while considering the scale of each predictor. The collinearity statistics provide insights into the relationships among predictor variables, which can influence the reliability of the coefficient estimates. In this regression analysis, all predictor variables (Intrinsic Motivation, Extrinsic Motivation, Safety Climate, Psychological Safety) are highly significant ( $p < 0.01$ ) in predicting the dependent variable (Safe Report). All the independent variables have a statistically significant relationship with the dependent variable, as indicated by the Sig. values being less than 0.01. The collinearity statistics suggest that multicollinearity is not a concern for this model, as the VIF values are all below 10, a common threshold for concern.

**Table 6** Regression analysis with unstandardized and standardized coefficients, t-values, and significance levels for each predictor variable.

Model	Unstandardized		Standardized			Correlations			Collinearity	
	Coefficients		Coefficients			Zero-			Statistics	
	B	Std. Error	Beta	t	Sig.	order	Partial	Part	Tolerance	VIF
1 (Constant)	.730	.180		4.047	.000***					
Intrinsic Motivation	.245	.051	.231	4.769	.000***	.522	.210	.168	.526	1.902
Extrinsic Motivation	.317	.047	.294	6.720	.000***	.527	.289	.236	.647	1.546
Safety climate	.158	.037	.184	4.274	.000***	.452	.189	.150	.665	1.504
Psychological Safety	.082	.031	.107	2.655	.008**	.286	.119	.093	.765	1.307

\*\*\*p < .001, \*\*p < 0.01

a. Dependent Variable: Safet Report

## Discussion

1. The investigation into the intricate interplay among internal motivation, extrinsic motivation, safety climate, psychological safety, and their collective influence on airport safety reporting behavior in Thailand unveiled a significant correlation ( $p < 0.01$ ). Intrinsic motivation, driven by employees' inherent satisfaction in safety-related activities, is associated with autonomous (intrinsic motivation) inclinations. These inclinations stem from fundamental psychological needs like autonomy, competence, and relatedness, pivotal in shaping employees' decisions to engage in safety reporting. This intrinsic motivation effectively curbs silence, fostering open communication that enhances safety. Furthermore, intrinsic motivation propels employees to willingly partake in inherently engaging safety tasks (Uysal & Yildirim, 2016). Conversely, extrinsic motivation, spurred by external control factors, is underpinned by Integrated

regulation and Identified regulation, whereby employees' valuing of safety work significantly influences safety performance (Deci & Ryan, 2008), A workplace perceived as safe nurtures positive employee attitudes (Son et al., 2023).

Subsequently, safety climate emerges as a pivotal gauge of safety performance, enabling predictions about safety behaviors and outcomes (Olsen, 2010). This predictive ability is instrumental in identifying perception gaps, subsequently guiding the formulation of measures, policies, and communication strategies aimed at augmenting performance (Schwatka & Rosecrance, 2016). Of paramount importance in cultivating a conducive work environment and fostering growth is the encouragement of open communication in the context of safety (Dehkharghani et al., 2022; Deniz et al., 2013). A workplace characterized by perceived safety nurtures positive attitudes among employees (Bunner et al., 2021).

Lastly, psychological safety emerges as an imperative facet, serving to amplify the positive impact of intrinsic motivation on reporting behaviors, concurrently mitigating adverse extrinsic motivation effects (Sebire et al., 2009). The effective promotion of psychological safety acts as a catalyst for encouraging safety reporting, thereby heightening organizational safety. The dual process of analyzing safety climate and advocating psychological safety aids in pinpointing gaps, thereby bolstering safety performance and communication strategies (Schwatka & Rosecrance, 2016). The issue of accident underreporting surfaces when safety doesn't receive adequate prioritization or regulations lack consistent enforcement, necessitating comprehensive enhancements (Probst & Estrada, 2010). Therefore, the holistic roles of motivation, safety climate, and psychological safety emerge as critical drivers in the realm of promoting safety reporting within Thailand's aviation sector. The factors influencing safety climate and security enforcement encompass training, communication, managerial focus, rewards,

commitment, reporting processes, and incident handling. These factors collectively contribute to the phenomenon of underreporting, spurred by elements such as unawareness, fear, doubt, and inefficacy (Barbaranelli et al., 2015; Petitta et al., 2017).

2. Based on the study formation of predictive equation from study findings, all predictor variables have significant p-values ( $p < 0.01$ ), indicating that they significantly contribute to the model's predictive ability. The collinearity statistics (VIF values) are within acceptable limits, indicating that multicollinearity is not a significant concern. The regression model has a good fit, as indicated by the F-statistic (78.855) being significant ( $p < 0.01$ ). The model's Adjusted R-squared (0.384) suggests that approximately 38.4% of the variability in the dependent variable is explained by the predictor variables. The standard error of the estimate (0.39479) provides an average measure of the variability between the actual and predicted values. The formulation of the prediction equation for safety reporting at the workplace reveals that  $\hat{Y} = 0.245(X_1) + 0.317(X_2) + 0.158(X_3) + 0.082(X_4)$ ,  $Z\hat{Y} = 0.231_{zx1} + 0.294_{zx2} + 0.184_{zx3} + 0.107_{zx4}$ ,  $R^2 = 0.389$ ,  $R^2$  Adjusted = 0.384

## Conclusion

This study underscores the pivotal roles played by motivational dynamics, safety climate, and psychological safety in shaping safety reporting practices within Thailand's aviation sector. These intricate elements collectively influence safety behaviors, communication strategies, and overall organizational safety performance, ultimately contributing to a safer and more informed aviation environment. The study emphasizes two key findings: (1) intrinsic motivation, extrinsic motivation safety climate, and psychological safety within teamwork are significantly correlated with safety reporting among Thai airport employees ( $p < 0.01$ ). (2) A predictive equation for safety reporting among Thailand's airport employees is established, underscoring the

integral role of motivation, safety climate, and psychological safety in enhancing safety reporting within the aviation industry. Intrinsic motivation, stemming from employee contentment with safety tasks, encourages open communication and proactive engagement. Conversely, extrinsic motivation, driven by external control factors, significantly influences safety performance, demonstrating the importance of motivation, safety climate, and psychological safety in Thailand's aviation sector. In conclusion, this study highlights the vital interaction of intrinsic and extrinsic motivation, safety climate, and psychological safety in influencing safety reporting within Thailand's aviation industry. These factors are key in promoting robust safety reporting, pivotal for elevating the awareness and responsiveness of aviation organizations. The study suggests that to enhance safety reporting in Thailand's aviation sector, organizations should focus on fostering intrinsic motivation among employees, ensuring a positive safety climate, and promoting psychological safety. Understanding these factors is essential for encouraging proactive safety reporting. Additionally, implementing predictive models based on the study's findings can guide strategic improvements in safety practices and policies within aviation organizations.

### **Research Recommendations:**

1. This research study focuses on the entirety of the employee group. To enhance the understanding of safety reporting, future studies could investigate safety reporting behaviors within specific job positions.
2. Expanding the research concept, qualitative studies could explore factors elements involved in safety reporting, broadening insights beyond the current scope.

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