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PATIENT SAFETY CULTURE AMONG NURSING ASSISTANTS, EMERGENCY MEDICAL ASSISTANTS, PHARMACY TECHNICIANS, AND MEDICAL SECRETARIES IN SAUDI HOSPITALS: A SYSTEMATIC REVIEW

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KEYWORDS

patient safety culture; nursing assistants; emergency medical assistants; pharmacy technicians; medical secretaries; Saudi Arabia; systematic review

ABSTRACT

Background. Patient safety culture in Saudi hospitals has been surveyed many times, but mostly among nurses, physicians and pharmacists. Nursing assistants, emergency medical assistants, pharmacy technicians and medical secretaries handle patients, medicines and records every day, yet their views are rarely reported separately. Objective. To identify and synthesise published evidence on patient safety culture among these four support-staff groups in Saudi hospitals. Methods. The review follows PRISMA 2020. PubMed was searched on 18 November 2026 for records from 2010 onward, supplemented by web searching and reference lists. Eligible studies were quantitative or mixed-methods surveys of Saudi hospital or emergency staff, published in English or Arabic from 2010 onward, that used a validated safety culture instrument and included at least one target group. Study quality was appraised with items from the JBI checklist for analytical cross-sectional studies. Findings were synthesised narratively. Results. The search identified 157 records; 33 reports were sought, 12 were retrieved and assessed, and all 12 were included (10 hospital or emergency service studies and 2 pharmacy studies used as context). Twenty-one reports could not be retrieved in full. None reported a full safety culture profile for any of the four groups. The only position-level data came from the 2022 national survey of 145,657 staff in 392 hospitals. Positive scores for response to error were 50.9% among healthcare assistants, 50.8% among paramedics and 54.7% among unit clerks, secretaries and receptionists, against 67.5% among managers. Pharmacy technicians were not reported separately in any study, and one hospital pharmacy survey excluded them. Across studies, teamwork within units and organisational learning scored highest; non-punitive response to error and staffing scored lowest. Conclusion. Support staff in Saudi hospitals are surveyed but not analysed. The limited data suggest they fear blame more than managers and pharmacists do. Future surveys should report

results by job category, and hospitals should include support staff in reporting systems and safety ***training.***

1. Introduction

Patient safety culture is the set of shared values, attitudes and behaviours that shape an organisation's commitment to safe care [1]. It is usually measured with staff surveys. The most widely used is the Hospital Survey on Patient Safety Culture (HSOPSC) from the US Agency for Healthcare Research and Quality, which scores composites such as teamwork, staffing, communication openness and response to error as the percentage of positive answers [1,2]. The Safety Attitudes Questionnaire (SAQ) and the Pharmacy Survey on Patient Safety Culture (PSOPSC) are common alternatives [3,4].

Saudi Arabia has made patient safety a national priority. The Saudi Patient Safety Center was established in 2017 under the Vision 2030 transformation programme, and it surveys hospital safety culture every year using the AHRQ tool [1]. Research interest has grown in parallel. A 2020 systematic review found 14 Saudi studies and concluded that ineffective leadership, a blame culture, workload and inadequate staffing, and poor communication were the main barriers to a positive safety culture [5]. An earlier review covering Arab countries reported on the same survey instrument across the region [6].

These reviews share one limitation. The evidence they summarise comes mainly from nurses, physicians, pharmacists and managers. In the 2020 review, six of the 14 studies sampled nurses only, and although technicians were eligible, their results were never reported separately [5]. Assistants and administrative staff were not examined as groups at all [5].

This matters because much of the routine work that determines safety is done by support staff. Nursing assistants deliver bedside care, move patients and are often the first to notice deterioration. Emergency medical assistants manage patients in the least controlled setting in the health system. Pharmacy technicians prepare and dispense medicines. Medical secretaries control appointments, records and the flow of information between units, where handoff errors arise. These staff usually have less formal training, lower rank and less job security than registered professionals. Each of these factors could plausibly reduce their willingness to speak up or report an error.

The Hafar Al-Batin and Eastern Province hospitals where the authors work depend heavily on these cadres, as do most Ministry of Health facilities outside the major cities. Yet no review has asked what is known about their safety culture.

Aim. This review identifies and synthesizes published evidence on patient safety culture among nursing assistants, emergency medical assistants, pharmacy technicians and medical secretaries in Saudi hospitals. It asks three questions:

1. Which Saudi studies have included these groups, and how were they categorised?
2. What do those studies report about their perceptions of safety culture?
3. How do their scores compare with those of other staff?

2. Methods

2.1 Design and registration

This systematic review is reported according to the PRISMA 2020 statement. No meta-analysis was planned, because the instruments, staff categories and scoring methods differ too much between studies to pool.

2.2 Eligibility criteria

Eligibility criteria are summarised in Table 1. Studies of hospital pharmacists and of community pharmacy staff were retained as contextual evidence for the pharmacy technician question, and are labelled as such.

Table 1. Eligibility criteria.

Element	Included	Excluded
Population	Hospital or emergency service staff in Saudi Arabia, where the sample includes nursing assistants or healthcare assistants, emergency medical assistants, technicians or paramedics, pharmacy technicians, or medical secretaries, unit clerks or receptionists	Samples of students only; samples restricted to physicians, registered nurses or pharmacists with no support staff
Exposure	Patient safety culture or climate measured with a validated instrument (HSOPSC 1.0 or 2.0, SAQ, PSOPSC or an adapted version)	Unvalidated single-item measures
Outcomes	Composite or domain scores; event reporting; differences by staff position	Clinical outcomes only
Design	Cross-sectional, longitudinal or mixed-methods studies	Editorials, protocols, conference abstracts without data
Setting	Government, military, university or private hospitals and hospital-linked emergency services	Primary care centres and dental clinics
Period and language	January 2010 to 18 November 2026; English or Arabic	Other languages

2.3 Information sources and search strategy

PubMed was searched on 18 November 2026 with the term “safety culture” AND Saudi, limited to publication years 2010 to 2026. The term was kept broad on purpose. Support staff are usually a minority inside mixed samples and are seldom named in titles or abstracts, so adding staff terms would have missed relevant studies. No other bibliographic database was searched. The search was supplemented by general web searching and by the reference lists of earlier reviews [5,6], which identified two further records.

2.4 Study selection

PubMed returned 155 records and other sources 2, giving 157 with no duplicates. Titles, and abstracts where available, were screened against the eligibility criteria by a single reviewer working with an artificial intelligence assistant (Claude, Anthropic). Records were excluded at this stage if they were not about Saudi Arabia or not about health care, sampled a single profession (nurses, physicians, dentists, pharmacists or managers only), sampled students, were set in primary care or dental clinics, or were reviews, protocols, commentaries or errata. This removed 124 records.

Full reports were sought for the remaining 33. Twenty-one could not be retrieved in full, because the publisher or repository page was inaccessible or only the abstract was available; they are listed in the Supplementary note. Twelve reports were retrieved and assessed, and all 12 met the criteria (Figure 1). For one of these, a community pharmacy study used as context, only the abstract was read [4].

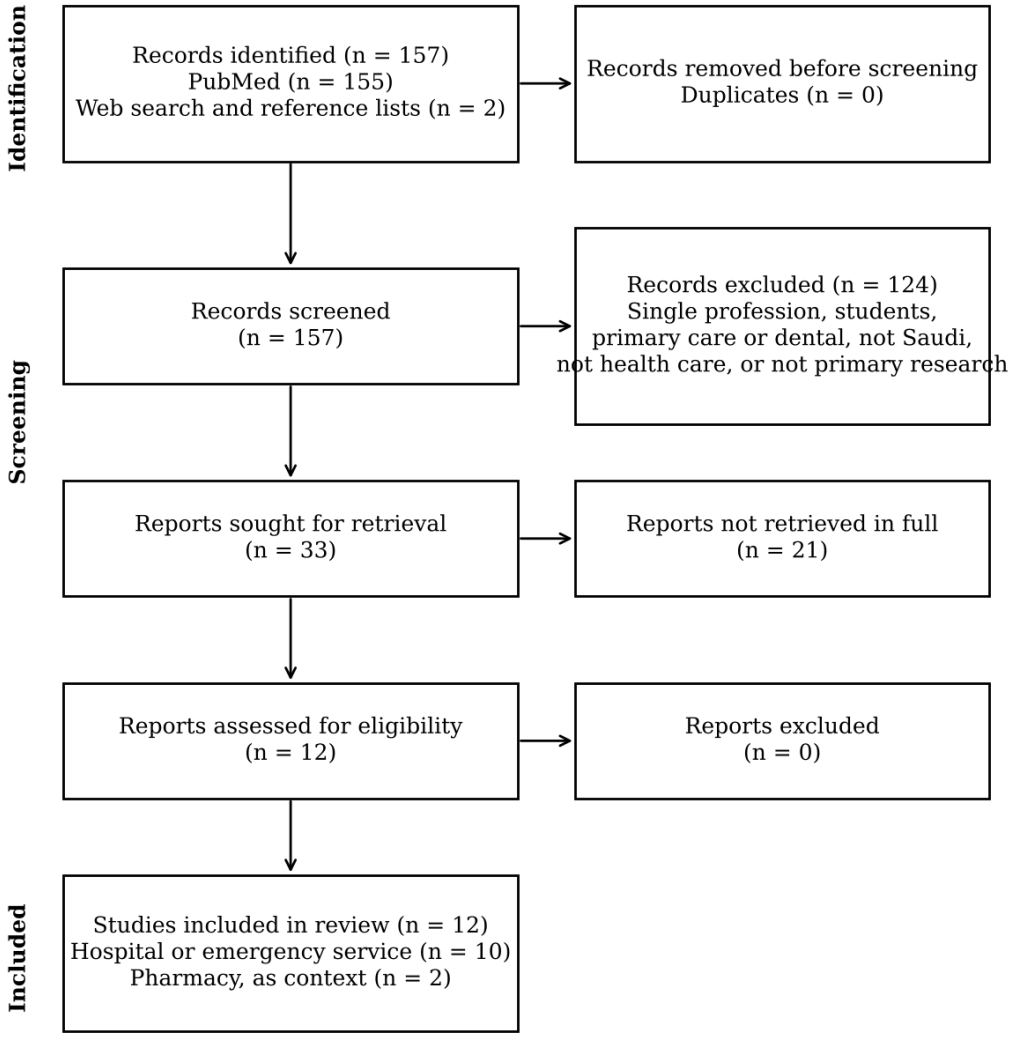


Figure 1. *PRISMA 2020 flow diagram.*

2.5 Data extraction

A standard form captured: authors and year; region and hospital type; data collection period; instrument; sample size and response rate; how support staff were categorised and their share of the sample; composite scores; event-reporting results; and any comparison by staff position. Data were extracted by one reviewer.

2.6 Quality appraisal

Each study was appraised by one reviewer against four items drawn from the Joanna Briggs Institute checklist for analytical cross-sectional studies: whether a validated instrument was used, whether the sample and response rate were described, whether the analysis adjusted for other factors, and whether results were reported by staff position. The full eight-item checklist was not scored, because several items could not be judged reliably from the reports as retrieved. Studies were not excluded on quality grounds.

2.7 Synthesis

Findings were synthesised narratively under four headings: study characteristics and quality, overall culture profile, evidence for each target group, and reporting behaviour. Percent-positive scores and mean scores are presented as published and were not converted.

3. Results

3.1 Study selection

Of 157 records, 124 were excluded at screening, 21 reports could not be retrieved in full and 12 studies were included (Figure 1). Ten are hospital or emergency service studies that included support staff in the sample. Two are pharmacy studies retained as context.

3.2 Study characteristics

Study characteristics are shown in Table 2. All 12 were cross-sectional surveys or repeated cross-sections. Six came from Riyadh. Response rates ranged from 22.2% in one survey round [2] to 78% [4]. None was designed to study support staff.

Table 2. Characteristics of the included studies.

Study	Setting and period	Instrument	Sample	How support staff appear
Alkahf and Alonazi 2024 [1]	392 hospitals nationwide, Jan–Mar 2022	HSOPSC 2.0 (reporting items)	145,657	Healthcare assistants 0.9%; paramedics 1.2%; unit clerks, secretaries and receptionists 2.9%; scores given per group
Titi et al. 2021 [2]	Tertiary teaching hospital, Riyadh, four rounds 2012–2019	HSOPSC 1.0	1,000 to 2,694 per round	Assistant, clerk, secretary or facilitator 1.1–5.2%; technicians 2.1–12.0%; no scores per group
AlReshidi et al. 2020 [7]	Five hospitals, Qassim, 2016–2017	HSOPSC 1.0 (mean scores)	1,460	Administrative staff 9.6%; allied health 14.0%; scores given per group
Irfan et al. 2025 [8]	200-bed secondary hospital, Riyadh, 2020	HSOPSC 1.0	613	Pharmacy, laboratory, radiology and administrative staff merged as “others” (17%)
Algethami et al. 2024 [9]	Tertiary centre, Makkah, 2023	HSOPSC 2.0	350	Clinical versus non-clinical comparison only
Alburaidi et al. 2023 [3]	Two emergency service organisations, Riyadh	SAQ, EMS version	310	Emergency medical technicians 10.6%; paramedics 72.6%; no scores per group
Alsahli et	Private,	Safety	402	Mixed

Study	Setting and period	Instrument	Sample	How support staff appear
al. 2024 [10]	Ministry of Health, other government and teaching hospitals, 2023	attitudes and reporting survey		professions; position counts not in text
Aljaffary et al. 2021 [12]	University teaching hospital, Eastern Province, 2018	HSOPSC	900 invited; 67% response	Nurses 58%; respiratory therapists 13%; technicians present; mean scores given by position and department
Alsulami et al. 2022 [13]	Tertiary hospital, Riyadh	HSOPSC, adapted	409	Support services 14.2%; other clinical positions 36.4%; no scores per group
Albaalharith and A'aqoulah 2023 [14]	Government, quasi-government and private hospitals, Riyadh, 2021	HSOPSC (mean scores)	204	Managerial or administrative 29.4%; managers compared with clinical staff
Al-Surimi et al. 2021 [11] (context)	Hospital pharmacies, Riyadh, 2017	PSOPSC	411	Pharmacy technicians excluded from the final sample
Almalki et al. 2021 [4] (context)	805 community pharmacies nationwide, 2019	PSOPSC	805	Pharmacy staff; technicians not separated

Table 3. Quality appraisal of the included studies (single reviewer).

Study	Validated instrument	Sample and response rate described	Adjusted analysis	Results by staff position
Alkahf and Alonazi 2024 [1]	Yes	Yes (response rate not given)	No	Yes, two domains, no tests
Titi et al. 2021 [2]	Yes	Yes (22.2% to 85.7%)	No	No
Alburaidi et al. 2023 [3]	Yes	Yes (317 of 1,800 agreed)	No	No
Almalki et al. 2021 [4]	Yes	Yes (78%)	Yes	No

Study	Validated instrument	Sample and response rate described	Adjusted analysis	Results by staff position
AlReshidi et al. 2020 [7]	Yes	Yes (73.0%)	Yes	Yes, broad categories
Irfan et al. 2025 [8]	Yes	Yes (57%)	Yes	Three merged groups
Algethami et al. 2024 [9]	Yes	Yes (59%)	No	Clinical versus non-clinical
Alsahli et al. 2024 [10]	Unclear	Yes (402 of 453)	Yes	Inconsistent between sections
Al-Surimi et al. 2021 [11]	Yes	Yes (76.4%)	Yes	Not applicable
Aljaffary et al. 2021 [12]	Yes	Inconsistent (600 or 805 responses reported)	No	Yes, mean scores
Alsulami et al. 2022 [13]	Adapted	Partly (online, response rate not given)	Yes	Tested, scores not shown
Albaalharith and A'aqoulah 2023 [14]	Yes	Partly (online, response rate not given)	No	Managers versus clinical

All studies relied on self-report. Sampling was by convenience or whole-staff invitation in most, and three recruited online without a stated response rate [1,13,14]. Two reports contained internal inconsistencies in sample size or results [10,12].

3.3 Overall safety culture profile

The hospital studies agree on the pattern of strengths and weaknesses. Teamwork within units and organisational learning scored highest. In the Riyadh teaching hospital, organisational learning ranged from 79.6% to 86.3% positive across four rounds, and teamwork within units from 78.5% to 84.8% [2]. In Qassim these two composites had the highest means, 3.95 and 3.92 out of 5 [7]. The Riyadh secondary hospital recorded 85% for teamwork within units [8].

The weakest composites were non-punitive response to error and staffing. Non-punitive response stayed between 24.8% and 27.2% positive over seven years in the Riyadh teaching hospital, and staffing fell from 35.1% to 31.9% [2]. Non-punitive response had the lowest mean in Qassim, 2.25 [7]. Staffing was lowest in the Riyadh secondary hospital at 43% [8], and staffing (20%) and non-punitive response (21.4%) were among the lowest in the Eastern Province teaching hospital [12]. Response to error also had the lowest domain mean, 2.67 out of 5, in a second Riyadh tertiary hospital [13]. At King Abdullah Medical City, overall positivity was 62% against 70% in the global AHRQ database, and staffing and work pace showed the largest gap, 17 points [9].

Two results ran against the pattern. Teamwork within units was low in the Eastern Province hospital (21.4%) [12], and staffing had the highest domain mean in one Riyadh hospital (3.66) [13].

The pharmacy studies show the same shape. Teamwork was the highest domain among

hospital pharmacists (74.4%) and community pharmacy staff (76.4%). Staffing, work pressure and pace was the lowest, at 25.5% and 34.8% [4,11].

3.4 Evidence for each target group

No study reported a complete safety culture profile for any of the four groups. The national survey is the only source with position-level scores, and it covers two reporting domains [1] (Table 4).

Table 4. Reporting-culture scores by staff position in the 2022 national survey [1]. The source paper gives no significance tests for these differences.

Staff position (survey label)	Share of sample	Response to error, % positive	Reporting patient safety events, % positive
Healthcare assistant	0.9%	50.9	62.4
Paramedic	1.2%	50.8	60.4
Unit clerk, secretary, receptionist	2.9%	54.7	61.9
Nurse	47.2%	53.0	64.2
Pharmacist	3.8%	60.3	74.7
Manager	4.2%	67.5	72.5

Nursing assistants. The closest category is "healthcare assistant". Their response-to-error score, 50.9%, was the second lowest of 16 positions and 16.6 points below managers [1]. No other study isolated them. In the Riyadh teaching hospital they were merged with clerks and secretaries [2]. In the Eastern Province teaching hospital, staff without direct patient contact scored higher overall than those with it (mean 147.30 versus 139.80) [12].

Emergency medical assistants. Paramedics had the lowest score of all positions on both domains, 50.8% and 60.4% [1]. In the Riyadh emergency services study, mean SAQ domain scores were between 2.74 and 2.91 on a five-point scale, with no significant difference between hospital-based and pre-hospital staff or by experience [3]. Emergency medical technicians were 10.6% of that sample, but their scores were not shown separately [3].

Pharmacy technicians. No study reported their scores. The Riyadh hospital pharmacy survey first listed technicians as eligible and then amended the questionnaire to exclude them [11]. The national survey has no pharmacy technician category [1]. The nearest evidence is by department: in the Eastern Province teaching hospital the pharmacy department had the lowest mean safety culture score of any department, 131.08 against an overall mean of 141.61, while technicians as a position group had the highest, 156.98 [12]. That paper does not say which technicians were included. Evidence for pharmacy technicians is therefore indirect.

Medical secretaries. Unit clerks, secretaries and receptionists scored 54.7% for response to error and 61.9% for reporting, both below pharmacists and managers [1]. In Qassim, by contrast, administrative staff most often had the highest perceptions, including 3.70 for teamwork across units and 3.69 for staffing [7]. That category combined all administrative grades. In three Riyadh hospitals, supervisors and managers scored higher than clinical staff (mean 2.43 versus 2.11, $p = 0.047$), and managerial or administrative respondents were 29.4% of the sample [14]. In another Riyadh hospital, support services staff were 14.2% of respondents and position had no significant effect on scores [13]. At King Abdullah Medical City, non-clinical staff rated hospital management support lower than clinical staff did (mean 3.2 versus 3.5, $p = 0.001$) [9].

3.5 Event reporting

Under-reporting was common in every study that measured it. Nationally, 48.3% of staff had reported no event in the previous 12 months [1]. The figure was 43% in the Riyadh secondary hospital [8]. In the multi-hospital survey, 60.9% had witnessed or been involved in an adverse event and 67.8% of those had reported it; perceived blame was negatively correlated with reporting frequency [10]. Non-punitive response to error was the strongest predictor of overall safety culture in Qassim ($\beta = 0.35$) [7].

4. Discussion

4.1 Main finding

The central finding is an absence. Saudi hospitals have surveyed safety culture repeatedly and at national scale, and support staff are in the samples, but their answers are almost never analysed. Researchers merge them into "others", "allied health" or "administrative staff", or leave them out. One hospital pharmacy study removed technicians after first planning to include them [11]. The earlier Saudi review reached the same point from the other direction: technicians were eligible, but no included study reported on them [5].

4.2 What the available data suggest

The one study that separates job categories points in a consistent direction. Healthcare assistants, paramedics and clerical staff gave some of the lowest scores for response to error, between 50.8% and 54.7%, while managers and quality staff gave the highest, 67.5% and 69.7% [1]. Staff at the bottom of the hierarchy appear to expect blame more than those who run the system. This fits what is known about the wider culture. Blame was named as a leading barrier in the 2020 review [5], and non-punitive response to error did not move from about 27% in seven years at a hospital that improved on most other measures [2].

The reporting domain adds a second signal. Pharmacists scored 74.7% for reporting events, against 60.4% for paramedics and 61.9% for clerks and secretaries [1]. Pharmacy work has structured medication-error reporting. Pre-hospital care and front-desk work often do not, and events there, such as a misfiled record or a delayed handover, may not be recognised as reportable.

The Qassim result, where administrative staff were the most positive group [7], seems to contradict this. The likely explanation is the category. "Administrative staff" there included managers and supervisors, whose views are known to be more favourable [1]. It should not be read as the view of medical secretaries.

For pharmacy technicians, only inference is possible. Pharmacists in hospitals and community pharmacies rated staffing, work pressure and pace far below every other domain [4,11]. Technicians share that workload and have less authority over it, so their experience is unlikely to be better.

4.3 Why support staff may experience safety culture differently

The single-hospital findings are mixed. Technicians scored highest in one hospital [12], position made no difference in another [13], and managers scored higher than clinical staff in a third [14]. None of these separates the four cadres of interest, so they neither confirm nor contradict the national pattern.

Three features of support roles are relevant. First, hierarchy. Communication openness, the freedom to question those with more authority, was below 50% in every round at the Riyadh teaching hospital [2]. Assistants and secretaries sit furthest from that authority. Second, staffing. It was the lowest or second-lowest composite in most studies [2,4,8,9,11,12], and shortages fall heavily on the staff who absorb routine tasks. Third, access to training and feedback. Safety training and incident feedback are usually organised through professional departments, which support cadres may not belong to.

4.4 Implications

For hospitals and health clusters. Reporting systems should be open to all staff, in Arabic, with a clear statement that reports are not used for discipline. Support staff should be included in safety briefings, root-cause reviews and feedback on reported events. Leadership walk-rounds should cover reception areas, pharmacies and ambulance bays as well as wards.

For the Saudi Patient Safety Center and researchers. The national survey already records job category. Publishing all ten composites by position would close most of the gap found here at no extra cost. Pharmacy technician should be added as a category. Primary studies should stop merging support staff into "others", and qualitative work is needed to explain why these groups expect blame.

4.5 Strengths and limitations

This is the first review to ask about these four cadres in Saudi Arabia. It has clear limits. The evidence is thin: one study supplies almost all position-level data, on two domains, without significance tests [1]. Survey categories do not match Saudi job titles exactly; "healthcare assistant" and "paramedic" are proxies for nursing assistants and emergency medical assistants. All studies are cross-sectional and self-reported, several have low response rates, and four come from Riyadh. Instruments and scoring differ, so no pooled estimate is possible.

The review process itself was limited. Only one bibliographic database was searched, with a simple term. Twenty-one of 33 reports sought could not be retrieved in full, including several national and multi-hospital surveys, so relevant position-level data may have been missed. Screening, extraction and appraisal were done by a single reviewer with an artificial intelligence assistant, not in duplicate, and the protocol was not registered. The findings should be read as a first map of the evidence, not a definitive synthesis.

5. Conclusion

Nursing assistants, emergency medical assistants, pharmacy technicians and medical secretaries are present in Saudi patient safety culture surveys but largely invisible in the results. The national data that do exist show that healthcare assistants, paramedics and clerical staff rate their organisation's response to error lower than managers and pharmacists do. Pharmacy technicians have not been reported on at all. The overall Saudi profile, strong teamwork and learning with weak non-punitive response and staffing, probably applies to these groups, and the blame component may be more severe for them.

Two actions follow. Survey owners and researchers should report results by job category, including pharmacy technicians. Hospitals should bring support staff into incident reporting, feedback and safety training on the same terms as registered professionals.

Declarations

Ethical approval. Not required for a review of published studies.

Data availability. All data are from published articles cited in the reference list.

Supplementary note: reports not retrieved in full (n = 21). Binkheder 2023 (BMC Health Serv Res); Alaska 2023 (J Patient Saf); Al-Surimi 2022 (Risk Manag Healthc Policy); Alyami 2023 (Cureus); Khalil 2026 (J Patient Saf); Abdurabuh 2024 (J Multidiscip Healthc); Alanazi 2026 (Healthcare); Alswat 2017 (BMC Health Serv Res); Alrowely 2019 (Risk Manag Healthc Policy); Alahmadi 2010 (Qual Saf Health Care); Abuabat 2026 (BMC Health Serv Res); Eldesoky 2025 (BMC Health Serv Res); Alharbi 2018 (Oman Med J); Al-Surimi 2021 (Glob J Qual Saf Healthc); El-Jardali 2014 (BMC Health Serv Res); Al-Awa 2012 (Ann Saudi Med); Alyazidi 2026 (Saudi Med J); Bany Hamdan 2023 (Cureus); Alenezi 2019 (J Clin Nurs); Almohanna 2026 (Healthcare); Al Malki 2018 (J Nurs Manag).

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