











Figure 3: The participants' reporting history of blood or other body fluids (n=397).

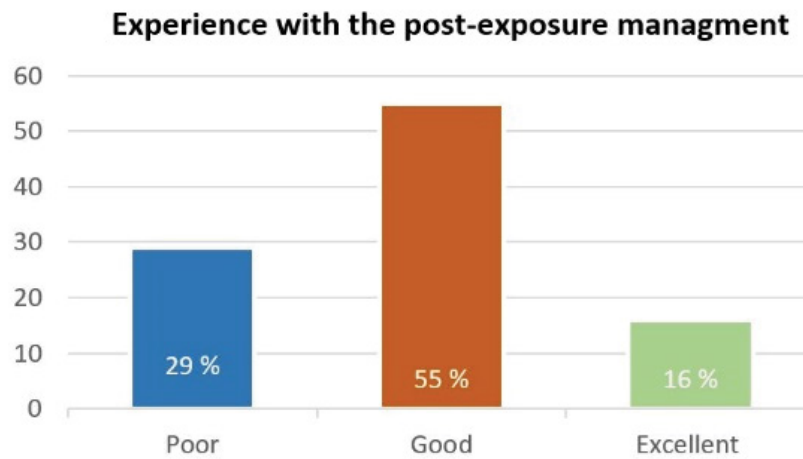


Figure 4: The participants' experience with post-exposure management (n=132).

Table 2: Participants' perceptions score of the culture of safety (n=397).

Score of perceptions		
Total Score		
95 % CI*	29.71 – 30.59	
Range	14- 38 points	
Median	31 points	
Mode	31	
Mean ± SD**	30 ± 4.4 points	
Score Category	Frequency	Percent (%)
Poor	12	3
Good	318	80
Excellent	67	17

\*CI: Confidence Interval, \*\*SD: Standard Deviation.

related to the administrative system, four health institutions were identified in order to assess the perception of the safety culture and sharps injury prevention among their workers. Occupational exposure to blood is a highly prevalent risk to healthcare workers. Globally, there are variations in the incidence rates of blood exposure throughout various studies depending on countries, the number of hospital beds, the job category of health staff, and different data recording periods. In the present study, almost a third of participants experienced blood exposure during their careers. This rate is higher than others reported in Saudi medical literature [13,14], similar to studies conducted in Iran [15] and Lebanon [16], and lower than one previous study in Egypt [17]. The anonymous data collection from participants in the current study allowed for admitting incidents of exposure that were never reported, which could explain the increased prevalence rate of blood exposure compared to previous studies that used registries or other data sources. Reporting the incidences of blood exposure to the hospital's concerned authorities is a challenge that requires leadership support.

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**Table 3:** Culture of safety perceptions among all participants (n=397).

Item	No (%)	Score (max=5)			
	Agree/ Strongly agree	Uncertain	Disagree/ Strongly disagree	Mean ± SD	Median
1. Commitment to safety	142 (35 %)	205 (52 %)	50 (13 %)	2.8 ± 0.4	3
2. Feedback on safety	151 (38 %)	180 (45 %)	66 (17 %)	2.9 ± 0.7	3
3. Promotion of hazard reporting	175 (44 %)	91 (23 %)	131(33 %)	3 ± 0.4	3
4. Personal accountability	227 (57 %)	27 (7 %)	143 (36 %)	3.1 ± 1.12	4
5. Hazard correction	297 (75 %)	57 (14 %)	43 (11 %)	3.8 ± 1.1	4
6. Availability of sharps containers	249 (63 %)	87 (22 %)	61 (15 %)	3.5 ± 1.05	4
7. Employee/management collaboration on safety	267 (67 %)	85 (21 %)	45 (12 %)	3.7 ± 0.98	4
8. Safety training	276 (69 %)	103 (26 %)	18 (5 %)	3.7 ± 0.79	4
9. Provision of safer technology	251 (63 %)	107 (27 %)	39 (10 %)	3.6 ± 0.9	4
10. Non-punitive reporting environment	350 (88 %)	23 (5.8 %)	24 (6 %)	4 ± 0.8	4

**Table 4:** Relation between participants' total perception score and their characteristics. (n=397).

Demographic and Occupational characteristics	Perception score (max=50)		
	Median	Median test Statistic	p-value
<b>Age category</b>			
20 - 30 years	31		
31 - 40 years	30		
41 - 50 years	31	5.1	0.07
<b>Gender</b>			
Male	30		
Female	31	2.5	0.13
<b>Nationality</b>			
Saudi	31		
Non- Saudi	31	3.05	0.61
<b>Health Sectors</b>			
Governmental Hospitals (Ministry Of Health)	31		
Governmental Hospitals (Military)	33		
University Hospitals	26		
Private Hospital	33	7.3	0.009*
<b>Profession</b>			
Physician	31		
Nurse	31		
Radiologist	30		
Lab worker	30		
Pharmacist	31	4.2	0.06
<b>Length of Experience</b>			
Less than five years	30		
From five to ten years	31		
More than ten years	31	2.7	0.249

The present findings seem consistent with other research, which found that less than half of the exposed individuals only reported their blood exposure incidents [13,18]. Further, this underreporting phenomenon may explain the lower exposure rates recorded in previous studies where the data source was from reporting papers. For the purpose of detecting and preventing positive seroconversion as promptly as possible, post-exposure management should be followed after accidental occupational exposure to blood and bodily fluids. Among those who had exposure to blood or other body fluids, the present study showed almost two-thirds expressed their satisfaction with post-exposure management and the follow-up care provided by the occupational clinic. However, the previous research [7] highlighted the dissatisfaction with waiting time and the need for rapid turnaround time for source patients' test results, which might help reduce the panic and anxiety among most healthcare workers. Institutionalizing a safety culture to protect patients, personnel, and others in the healthcare environment is an essential element of the success of the occupational injury prevention program. In the present study, the overall perception of a culture of safety was good in Saudi health institutes. It is interesting to note that although the health institutes were striving to build a culture of safety for their workers, half of the participants were uncertain whether workers' safety was a priority in their healthcare organization. Moreover, the perception was poor among a third of them regarding their organizations' efforts to encourage and reward the recognition and reporting of errors and hazardous conditions. This discrepancy could be attributed to the misunderstanding of the leadership role [19] of the culture of safety in their health institutes. According to the results of the present study, none of the participants' personal characteristics had a significant relationship to their perceptions of the safety culture in their health institutes. This supports the generalization of this survey and indicates

equal perception scores across all ages, gender, job types, and different lengths of experience. Contrary to expectations, this study showed lower perception scores among healthcare workers in private hospitals, however, this statistical significance result is difficult to be explained, but it might be related to the fact [20] that the private health sector has a different system that is neither owned nor directly controlled by government regulations in regard culture of safety. Limitations of the current study include the fact that it was cross-sectional; hence, the results are mainly observations for formulating the hypothesis only. Additionally, because of the limited accessibility to the Saudi health institutes, we could not use the probability sampling technique and thus influence the level of research generalizability.

## Conclusion

This study has shown that the perception of a culture of safety and sharps injury prevention was optimal among healthcare workers in Saudi institutes. Despite significant progress in lowering the risk of occupational exposure to bloodborne pathogens, there is still a need to do more. Leadership support and commitment to promoting safety should be translated and demonstrated by assessing the culture of safety perception of the employees as baseline data for the purposes of future improvement.

## Conflict of Interest and Financial Relationships

All authors have declared that they have no conflict of interest or financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

## Authorship

The manuscript has been read and approved by all the authors, that the requirements for authorship have been met, and that each author believes that the manuscript represents honest work

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