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Impact of Nurses' Burnout on Patient Safety among Lebanese Hospitals

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Abstract:

Background and aim: Burnout syndrome is a psychological condition that arises gradually due to persistent work-related stress. Among nurses, burnout is associated with numerous adverse outcomes, including decreased job performance, increased likelihood of errors, incomplete care, and compromised patient safety. Over the past four years, Lebanon has faced multiple crises, including a severe economic downturn, the Beirut port explosion, the COVID-19 pandemic, and ongoing conflict in the south, all of which have significantly impacted healthcare workers. This study aims to assess the effect of nurse burnout on the implementation of International Patient Safety Goals (IPSG) in various Lebanese hospitals.
Material and Methods: A cross-sectional study was conducted in March 2024. Registered nurses from hospitals across Lebanon were invited to complete the Maslach Burnout Inventory and a questionnaire on compliance with IPSG. Participants were selected through non-random sampling, and data collection was done online. Data analysis was performed using SPSS version 21.
Results: The prevalence of burnout among participants was 43.96%, with 8.79% experiencing high levels and 35.17% moderate levels of burnout. The study explored the relationship between burnout and three selected patient safety indicators: medication errors, healthcare-associated infections, and patient misidentification related to falls. Findings indicated that burnout significantly impacted patient safety, with higher burnout levels correlating with increased reports of adverse events, particularly medication errors and patient misidentification.
Conclusion: This study provides compelling evidence of the negative impact of nurse burnout on patient safety. Higher levels of burnout were linked to an increased occurrence of adverse events, with a notable association between patient safety grade and nurse burnout and workload. These findings underscore the importance of addressing burnout to enhance patient safety.

Keywords: Nurses; Burnout; Patient Safety; Lebanon.

Introduction

As Lebanese nurses, we have faced and continue to face a number of obstacles and challenges in our beautiful country beginning with the novel coronavirus disease (COVID-19) outbreak and its new variations, some of which go away and others recur sometimes; also the ongoing economic crisis that started approximately three years ago and is still going strong, which included the 2020 Beirut Port explosion; these events, which the writer described in his article in 2022, as "The red arrow of calamities" [1] which started on October 2019 with the wildfire till the port explosion in 2020; unfortunately this arrow continue with the most recent event now, the Israeli war on Gaza, Palestine which started on October 7, 2023 till present, and had a direct impact on all Lebanese citizens in general and the south's residents in particular. As a result, many people in the region were forced to relocate to safer areas, including a sizable number of medical and nursing personnel who were abruptly compelled to abandon their residences close to the border with Palestine, while the remainder of them performed their full duties to make up for the deficiencies left by their colleagues and, on the other hand, to provide emergency care to their families in the south due to the ongoing hostile bombing by the Israelis; It is impossible to overlook the concern these courageous nurses have for their houses, where they constantly worry about losing their memories and their homes itself, as well as for their families and the death of a family member. This is in addition of the physical, mental, and emotional strain many workers experience while performing their jobs [2-4].

Dealing with the human side of health and illness, nursing is a demanding career that can eventually result in burnout and job discontent. The Institute for Healthcare Improvement states that, "if burnout in healthcare were described in clinical or public health terms, it might well be called an epidemic." Working in hospital can be particularly stressful owing to high patient morbidity and mortality, challenging daily work routines, and frequent encounters with traumatic and ethical issues. When assessed using the Maslach Burnout Inventory, 43.9% of physicians reported at least 1 symptom of burnout. Using the Maslach Burnout Inventory, up to 86% of critical care nurses report at least 1 symptom of burnout, with 25% to 33% of critical care nurses manifesting symptoms of severe burnout syndrome [2]. In addition to having a detrimental effect on their families, burnout affects the mental and physical health of doctors, nurses, and other healthcare professionals. It leads to decreased staff engagement, which correlates with a less positive patient experience, decreased productivity, and an increased risk of workplace accidents. [3,4]

From the 2000s onwards, there has been a growing focus on enhancing the caliber of healthcare systems. According to an Institute of Medicine report from 2000, there were more deaths from medical accidents than from all traffic accidents combined with HIV mortality, which resulted in a huge financial burden on

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health care. Therefore, patient safety is gaining priority in health care settings to avoid unnecessary harm to patients. Patient safety involves minimizing risks and reducing exposure to mistakes and near misses during delivering health care services. Over the past 10 years, efforts have been made in policy, research, and service to improve patient safety and reduce medical errors. Safety management in the general business is centered on averting financial damages for institutions. Contrastingly, patient safety management in health care settings entails financial problems and the negative consequences that may occur to patients; errors must not further progress into harm. Thus, in today's healthcare systems, where improving patient safety and treatment quality is the primary goal, health care professionals are crucial to patient safety. [3]

Although they differ from one another, professional well-being, depression, anxiety, and burnout syndrome are determining factors that impact the care given to patients. There is evidence to support the claim that there is a link between moderate to severe burnout, low well-being, and poor patient safety, which leads to assistance errors. Exhaustion during work hours prevents health workers from providing appropriate care, which could impact patients as well as the health system as a whole. Adverse occurrences are characterized as potential consequences that could result from mistakes made during patient treatment and do not fit into the illness's normal course. These are referred to as preventable unfavorable occurrences when they are the result of mistakes. [4]

Burnout directly influences the care provided to patients as there is a proven relationship between poor well-being and moderate to high levels of burnout and poor patient safety resulting in assistance errors. Burnout can lead to Brownout, which is a type of professional exhaustion caused by a loss of sense of work; It is defined as "a professional ill being, feeling disillusioned and down due to the loss of sense in the face of the tasks to be accomplished" [5].

Based on our introduction and the overall political and economic climate of our country, we need to carry out a contemporary study that illustrates the effects of this tragic situation on the health sector as a whole, and specifically on the psychological well-being of nursing staff and how that leads for cases of burnout and their direct impact on patient safety.

Purpose of study

The purpose of this study was to investigate the impact of nursing burnout on the implementation of the International Patient Safety Goals in multiple hospitals located in Lebanon.

Materials and Methods

Design

A cross sectional study utilized descriptive design to examine the relationships between variables at a single point in time.

Sample and Sampling

A non-probability convenience sampling was used to recruit the participants of the study. The sample consisted of 182 bedside nurses working in Lebanese hospitals across medical/surgical and critical care units. Inclusion criteria focused on male and female bedside nurses directly interacting with patients, excluding practical nurses. A non-probability, expert sampling technique was employed.

Settings

The study took place in multiple Lebanese hospitals, and data collection occurred in March 2024.

Study Variables

The primary dependent variable was patient safety, while nursing burnout was the independent variable. Additional variables included monthly income satisfaction, experience length, nurse-to-patient ratio, workload, reporting frequency, and nurse handoffs.

Ethical considerations

This study received approval from the Dean and the Head of the Department of Nursing Sciences at the Islamic University of Lebanon (IRB number: 2024/D1/4), with support letters sent to the participating hospitals. Following administrative consent from each hospital, the study's purpose, confidentiality protocols, and voluntary participation were explained to the nursing staff. Nurses were informed of their right to join or withdraw from the study at any time, and verbal consent was obtained prior to survey participation. All collected data remained confidential, anonymized, and used strictly for research purposes to protect participants' privacy. Additionally, the study protocol was approved by the Scientific and Ethical Committee of Hiram Hospital (IRB number: D1234).

Instruments

Data were gathered using a structured questionnaire, organized into three sections: socio-demographics and work characteristics, burnout severity, and adherence to international patient safety goals. The Maslach Burnout Inventory (MBI) assessed burnout with 22 items across three subscales: Emotional Exhaustion (EE), Depersonalization (DP), and Personal Accomplishment (PA). Responses were measured on a seven-point Likert scale from "never" (0) to "daily" (6), with specific score thresholds indicating low, moderate, or high burnout levels. A high burnout degree was signified by low PA and high EE and DP scores. Adherence to international patient safety goals was evaluated using questions aligned with the Lebanese Ministry of Public Health's latest Accreditation Standards for Hospitals (2022). All instruments were administered in English, considering the target sample's familiarity with the content.

Data Collection Procedure

Data collection was conducted using a structured and validated questionnaire designed to capture comprehensive information related to the study objectives. The questionnaire was distributed online to ensure ease of access for participants across various hospital settings in Lebanon. Each participant was provided with a cover letter that explained the purpose of the study, emphasizing the voluntary nature of participation, confidentiality of responses, and assurance that data would be used solely for research purposes.

Nurses were also informed that they could withdraw from the study at any time without repercussions. Prior to starting the survey, participants were asked to provide oral consent to

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confirm their understanding and agreement to participate. The questionnaire took approximately 10–15 minutes to complete and included clear instructions to minimize any potential confusion regarding question interpretations. Data collection occurred over a one-month period, ensuring sufficient time for nurses with various shift schedules to participate. The collected data was then securely stored for analysis and maintained according to confidentiality standards.

Data Analysis

Descriptive statistics, including frequencies and percentages, were used to summarize data. Analyses were performed using SPSS v21, with Chi-square tests applied to detect significant relationships among variables.

Results and Discussion

Socio-demographic characteristics

The participant characteristics are summarized across several key demographics and work-related factors in Table 1. The sample was predominantly female (60.99%), with males comprising 39.01%. The most represented age group was 18-25 (46.7%), followed by ages 30-39 (24.73%), 26-29 (19.78%), and 40-49 (8.79%). Most participants held a bachelor's degree (51.1%), while other educational levels included LT (23.08%), TS (12.09%), Master's (9.89%), and BT (3.85%).

Regarding hospital location, participants were primarily from South Lebanon (56.04%), followed by Beirut (12.64%), Bekaa & Baalbeck-Hermel (10.99%), Nabatiyeh and Mount Lebanon (8.79% each), and North Lebanon (2.75%). Intensive care unit nurses made up the largest departmental group (40%), with others in medical units (29%), surgical units (15%), and emergency units (16%). Most respondents held the title of Registered Nurse (68.7%), with team leaders and head nurses representing 16.5% and 14.8%, respectively. In terms of experience, 28% had 1-3 years of experience, 20.9% less than 1 year, 17.6% had both 5-10 years and 11+ years, and 15.9% had 3-5 years.

Nurse-to-patient ratios varied, with 40.66% managing 7-10 patients, 31.87% handling fewer than 4, and 27.47% overseeing 4-6 patients. Most nurses reported dissatisfaction with their monthly salary (87.36%), and only 12.64% felt adequately compensated. Additionally, 40.66% expressed an intent to leave their position within 12 months, 34.07% were uncertain, and 25.27% intended to stay.

Table 1: Demographic Data

Characteristics		Percentage (%)	Frequency
Gender	Females	60.99	111
	Males	39.01	71
Age	18-25	46.70	85
	26-29	19.78	36
	30-39	24.73	45
	40-49	8.79	16
Educational Degree	Master	9.89	18
	Bachelor	51.10	93
	LT	23.08	42
	TS	12.09	22
	BT	3.85	7
Hospital's Province	South Lebanon	56.04	102
	North Lebanon	2.75	5
	Mount Lebanon	8.79	16
	Bekaa	1.65	3
	Baalbeck-Hermel	9.34	17
	Beirut	12.64	23
	Nabatiyeh	8.79	16
Work department	Medical unit	29	52
	Surgical unit	15	28
	Intensive care units	40	72
	Emergency unit	16	30
Job title	Head nurse	14.8	27
	Team leader	16.5	30
	RN	68.7	125
Experience	Less than 1 year	20.9	38
	1 to 3 years	28	51
	3 to 5 years	15.9	29
	5 to 10 years	17.6	32
	11 or more	17.6	32
Nurse to patient ratio	1-3 pts	31.87	58
	4-6 pts	27.47	50
	7-10 pts	40.66	74
Monthly salary satisfaction	Yes	12.64	23
	No	87.36	159

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Desire to leave work	Yes	40.66	74
	No	25.27	46
	I don't know	34.07	62

Linking between burnout and Implementing of patient safety goals

Of the 182 nurses surveyed, 43.96% experienced burnout, with 8.79% at a high level and 35.17% at a moderate level. The remaining 56.04% of nurses showed no burnout symptoms. In relation to the goal of safe medication use, burnout was associated with reduced adherence to key practices. Among nurses with burnout, 28 did not label medications, compared to only 7 nurses without burnout. Furthermore, 29 nurses experiencing burnout did not verify high-alert medications with a second RN, compared to 5 nurses without burnout. Medication reconciliation was also less frequently applied among nurses with burnout, with 39 not performing it versus 15 among those without burnout. These findings suggest a clear negative impact of burnout on medication safety practices, potentially increasing the risk of medication errors [10,11]. See Table 2.

Regarding healthcare-associated infection control, burnout was linked to lower compliance with transmission-based precautions and PPE use, as 28 nurses with burnout and 4 without did not adhere to these measures. Additionally, 30 burnout-affected nurses neglected standard precautions. This noncompliance heightens the risk of infection transmission, threatening patient and staff safety [12].

For reducing fall-related risks, burnout again showed a significant impact. Among nurses with burnout, 45 did not implement one-on-one monitoring for high-risk patients, and 9 did not take measures to reduce fall risks. This lack of adherence to fall prevention protocols among nurses facing burnout underscores a potential risk for increased patient harm due to falls [13,14].

Overall, these findings demonstrate a substantial association between nurse burnout and decreased adherence to critical patient safety protocols. Burnout not only impairs nurses' well-being but also compromises patient safety by reducing compliance with established guidelines for medication administration, infection control, and fall prevention [15-18]. Addressing nurse burnout is crucial to sustaining patient safety standards and enhancing the quality of care [13, 15].

Table 2: Linking between burnout and Implementing selected patient safety goals

	Burnout(yes)=43.96%			Burnout(no)=56.04%		
	yes	Sometimes	no	yes	Sometimes	no
International patient safety goals/ Use medicine safely (n=182)						
Labeling medication	44	8	28	86	9	7
Verifying high alert medication	44	7	29	87	10	5
Medication reconciliation	30	11	39	76	11	15
International patient safety goals / Reduce health care associated Infections						
Applying standard precautions	42	8	30	89	8	5
Applying transmission based precautions	44	8	28	91	8	3
Hand hygiene	42	9	29	84	13	5
Using PPEs (Protective personal equipment)	47	5	28	91	7	4
Medication preparing clean workspace	37	8	35	88	9	5
International patient safety goals/ Reduce the Risk of Patient Harm from fall						
One-on-one monitoring	23	12	45	72	17	13
Implanting measures to reduce falls risks for patients	65	6	9	93	8	1

The relations between students' burnout, socio-demographic characteristics, and safety goals implementation.

The Chi-square test identified statistically significant relationships between burnout and multiple variables. Among socio-demographic variables, burnout was significantly associated with age (p = 0.048), hospital (p = 0.045), monthly salary satisfaction (p < 0.001), and intention to leave work (p = 0.004). See Table 3.

For the first goal, using medications safely, burnout was significantly related to several key practices: medication labeling (p < 0.001), verification of high-alert medications by two RNs (p < 0.001), and medication reconciliation (p < 0.001). In relation to the second goal, reducing healthcare-associated infections, burnout showed significant associations with compliance in several infection control practices, including: applying standard precautions (p < 0.001), transmission-based precautions (p < 0.001), hand hygiene (p < 0.001), PPE use when exposed to infectious materials (p < 0.001), respiratory precautions (p < 0.001), aseptic techniques (p < 0.001), preparing medications in clean workspaces (p < 0.001), and safe handling and disposal of sharps (p < 0.001). Disinfection practices, both in patient care areas (p = 0.003) and for reusable equipment (p = 0.040), also had significant associations with burnout.

For the final goal, identifying patient risks for harm, significant relationships were found between burnout and the implementation of one-on-one monitoring for high-risk patients (p < 0.001) as well as measures to reduce fall risks (p < 0.001). Among patient safety indicators, burnout was significantly associated with increased rates of medication errors (p < 0.001), healthcare-associated infections (p = 0.045), and patient falls (p = 0.045). These findings highlight that burnout significantly impacts adherence to patient safety protocols across key areas, underscoring the importance of addressing burnout to maintain safe, effective nursing practices [16, 17, 19, 20].

Table 3: relationship between study variables and burnout

Variable	Asymptotic significance (2-sided)	Frequency & Percentage

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Socio-demographics		
Age	0.048*	
Gender	0.200	
Hospital	0.045*	
Educational degree	0.082	
Work department	0.480	
Job title	0.012*	
Experience	0.169	
Nurse to patient ratio	0.145	
Monthly salary satisfaction	0.000**	
Desire to leave work	0.004*	
Patient safety goals/ use medicine safely		
Labeling medications	0.000**	Yes: 44 (55%) No: 28 (35%) Sometimes: 8 (10%)
Verifying high alert medications	0.000**	Yes: 44 (55%) No: 29 (36.25%) Sometimes: 7 (8.75%)
Medication reconciliation	0.000*	Yes: 30 (37.5%) No: 39 (48.75%) Sometimes: 11 (13.75%)
Patient safety goals/ Reduce health care associated Infections		
applying standard precautions	0.000**	Yes: 42 (52.5%) No: 30 (37.5%) Sometimes: 8 (10%)
Applying transmission-based precautions	0.000*	Yes: 44 (55%) No: 28 (35%) Sometimes: 8 (10%)
Performing hand hygiene	0.000**	Yes: 42 (52.5%) No: 29 (36.25%) Sometimes: 9 (11.25%)
Using PPEs in exposure to infectious material	0.000*	Yes: 47 (58.75%) No: 28 (35%) Sometimes: 5 (6.25%)
Measures to individuals with respiratory symptoms	0.000**	Yes: 39 (48.75%) No: 32 (40%) Sometimes: 9 (11.25%)

Item	p-value	Response
Using Single room for infectious patients	0.904	Yes: 68 (85%) No: 5 (6.25%) Sometimes: 7 (8.75%)
Using Sterile items for aseptic procedures	0.000**	Yes: 36 (45%) No: 8 (10%) Sometimes: 36 (45%)
Performing aseptic technique	0.009**	Yes: 60 (75%) No: 9 (11.25%) Sometimes: 11 (13.75%)
medication preparing in clean workspace	0.000**	Yes: 37 (46.25%) No: 35 (43.75) Sometimes: 8 (10%)
Disinfection of skin prior to invasive procedure	0.735	Yes: 61 (76.25%) No: 9 (11.25%) Sometimes: 10 (12.5%)
availability of sharps container at the point of care	0.000**	Yes: 43 (53.75%) No: 27 (33.75%) Sometimes: 10 (12.5%)
re-capping the needle	0.357	Yes: 24 (30%) No: 43 (53.75%) Sometimes: 13 (16.25%)
sharps container discarding when its three quarter full	0.000**	Yes: 34 (42.5%) No: 40 (50%) Sometimes: 6 (7.5%)
Disinfection of patient care areas	0.003**	Yes: 55 (68.75%) No: 15 18.75%) Sometimes: 10 (12.5%)
Reusable equipment disinfection	0.040*	Yes: 60 (75%) No: 12 (15%) Sometimes: 8
Patient safety goals/ Reduce the Risk of Patient Harm		
one-on-one monitoring	0.000**	Yes: 23 (28.75%) No: 45 (56.25%) Sometimes: 12 (15%)

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Removing objects that pose a risk for self-harm	0.249	Yes: 62 (77.5) No: 11 (13.75) Sometimes: 7 (8.75)
Implementing measures to reduce falls risks for patients	0.000*	Yes: 65 (81.25%) No: 9 (11.25%) Sometimes: 6 (7.5%)
Patient safety Indicators		
Medication error	0.000**	Never: 41 (51.25%) Rarely: 23 (28.75%) Sometimes: 10 (12.5%) Often: 6 (7.5%) Always: 0
Health care-associated infections	0.045**	Never: 39 (48.75%) Rarely: 15 (18.75%) Sometimes: 10 (12.5%) Often: 12 (15%) Always: 4 (5%)
Patient harm from fall	0.045*	Never: 40 (50%) Rarely: 14 (17.5%) Sometimes: 10 (12.5%) Often: 12 (15%) Always: 4 (5%)

Extraneous variables relation to patient safety variables

We examined extraneous variables to identify any additional factors influencing patient safety beyond nurse burnout. Among these, only workload showed a statistically significant relationship with implementing measures to reduce fall risk (p = 0.032). Other factors, such as frequency of reporting accidents/incidents (p = 0.296) and handoffs and transitions (p = 0.580), did not demonstrate significant associations with medication errors. See Table 4.

Comparative studies have reported similar findings. For instance, a study conducted in Canada using the Maslach Burnout Inventory (MBI) indicated that nurses with higher burnout levels reported more frequent adverse patient events, particularly medication errors, and perceived a lower overall patient safety grade [2]. Likewise, a study in Slovakia involving 117 nurses found that higher burnout levels correlated with a lower patient safety grade, increased frequency of adverse events, and a rise in medication errors [21]. In Jordan a similar finding was found among nurses in public hospitals [17, 18].

Our study highlighted the mental health challenges faced by nurses, emphasizing the need for employers, policymakers, and health institutions to invest in reducing emotional exhaustion and improving nurses' mental well-being [10,16, 18]. These efforts could lead to lower burnout rates, enhanced nursing performance, improved patient safety, and reductions in medication errors, falls, and healthcare-associated infections related to burnout [22, 23] and prevent future crisis such as violence in the workplace [24, 25].

Table 4: Extraneous variables and patient safety

Extraneous Variables	Patient safety variables	Asymptotic significance (2-sided)	Percentage
Workload	Measures to reduce fall risk	0.032*	Strongly disagree: 76.7% Disagree: 10% Neither: 8.3% Agree: 3.3% Strongly agree: 1.7%
frequency of reporting	Medication errors	0.296	Strongly disagree: 61.7% Disagree: 28.3% Neither: 6.7% Agree: 1.7% Strongly agree: 1.7%
handoffs & transitions	Medication errors	0.580	Strongly disagree: 1.7% Disagree:8.3% Neither:36.7% Agree: 20% Strongly agree: 33.3%

Limitations

The major limitation of this study is that the research was conducted in a short period of time. So, longitudinal studies are needed to explore the factors affecting nursing burnout with large sample. Another limitation we faced is the study was conducted ina single hospital which may affect the generalizability of the findings to other nurses in other hospitals. Understanding the role of other factors that could affect the nurses' burnout were

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not measured, thus, further qualitative studies are needed to explore the nurses' perspectives for these factors.

Conclusion

This study provided substantial evidence of burnout's detrimental impact on patient safety, identifying both nurse burnout and workload as critical vulnerabilities in maintaining patient safety standards. With 43.96% of participating nurses experiencing moderate to high levels of burnout, findings revealed significant associations between burnout and increased incidents of medication errors, healthcare-associated infections, and fall-related patient harms. Higher burnout prevalence correlated with more frequent adverse event reports, diminished perceptions of overall patient safety, and a lower patient safety grade. These findings underscore a significant, negative association between nurse burnout, workload, and the patient safety climate within hospitals.

Ethics approval and consent to participate

The Institutional Review Board at University of Jordan approved this study on 11/5/2022 (Ref no. 2/13/2021-2022). The current study followed the Declaration of Helsinki provisions, and all participants provided informed consent. The permission to use the measurement instruments has been received from the original author.

Consent for publication

The authors grant the Publisher permission to publish this work. All the data generated for this study are included within the article.

Availability of data and materials

All data generated during this study are included in this published article.

Author's contribution

study conception and design: Hanan Al-Obieat, Mohammad Al-Osta, Sajeda Al Hamory Ismael Alblishi, Eyad Abu Alhaijaa; data analysis and validation, Fathieh Abu Moghli, Hanan Al-Obieat, Mohammad Al-Osta, Sajeda Al Hamory Ismael Alblishi, Eyad Abu Alhaijaa, Mohammad Alnaeem; draft manuscript preparation: Fathieh Abu Moghli, Hanan Al-Obieat, Mohammad Al-Osta, Sajeda Al Hamory Ismael Alblishi, Eyad Abu Alhaijaa, Mohammad Alnaeem. All authors reviewed the results and approved the final version of the manuscript.

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Conflicts of interest

The authors report no conflict of interest.

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