Factors Facilitating the Perpetration of Medical Identity Theft: A Case of Ahmadu Bello University Teaching Hospital (ABUTH), Zaria

Akeem Olalekan **AYUB**
Department of Sociology, Federal University Gusau, Zamfara
ayubakeemola@fugusau.edu.ng

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Abstract
Medical Identity Theft is a pressing concern in healthcare systems, influenced by intricate motivations and vulnerabilities. This study investigates facilitating factors behind MIT, uncovers internal vulnerabilities, and proposes mitigation strategies. This study contributes to patient well-being and trust by fostering a secure healthcare environment through holistic MIT prevention strategies. A mixed-methods approach was employed, encompassing quantitative and qualitative aspects to explore the perpetration of MIT, Zaria, a significant healthcare institution. The diverse sample of 388 participants, including patients, healthcare providers, and stakeholders, was obtained through stratified random sampling. Structured interviews and questionnaires gathered primary data. Findings showcase a diverse workforce with a mid-career presence and gender distribution in technical roles. Significant facilitating factors for MIT encompass financial gain, fraudulent service access, and expense avoidance, necessitating robust patient identification procedures and comprehensive strategies. Internal vulnerabilities and inadequate data security underscore the need for enhanced measures, updated systems, and education. Respondents endorse a multifaceted approach, advocating biometric identification, authentication, patient photograph display, unique identifiers, access controls, staff training, real-time data verification, audit trails, data encryption, and patient education. Collaboration, awareness, and technology emerge as key elements in safeguarding patient data, ethical healthcare standards, and integrity. Findings advocate a comprehensive approach, emphasizing collaboration, awareness, and technology in addressing MIT.
Keywords: Healthcare Security, Internal Vulnerabilities, Medical Identity Theft, Mitigation Strategies, Patient Data Protection

Email: ayubakeemola@fugusau.edu.ng

1 Introduction

A nation's development is intertwined with the health of its population, emphasizing the importance of prioritizing citizen well-being. Healthcare, as a social service, plays a pivotal role in economic growth and technological advancement. Nonetheless, fraudulent activities within the healthcare sector pose challenges to effective service delivery. A significant challenge in healthcare is Medical Identity Theft (MIT), where individuals exploit personal information to acquire prescription drugs or services. Identity theft, a global concern, involves the unauthorized use of personal information for financial gain. MIT involves collaborations between insured and uninsured individuals, with the former misusing the latter's identity for medical treatments. This includes medical insurance theft, a form of healthcare fraud, encompassing deliberate deception by individuals or organizations for unauthorized benefits (National Health Agency, 2018). Additionally, MIT exploits personal information for medical or financial gains (Biegelman, 2012).MIT occurs when individuals use another's identity to access medical services or equipment. Perpetrators may exploit customer information to fraudulently bill insurance providers. Instances of MIT involve fraudulent insurance claims. Such actions can manipulate victims' records, leading to incorrect treatment decisions. Healthcare employees can perpetrate MIT by submitting false claims to health insurance, resulting in substantial financial damages. While MIT is well-documented in developed nations, its prevalence is low in Nigeria. This study aims to raise awareness about MIT's risks for patients and healthcare institutions in Kaduna State and Nigeria.

In the evolving healthcare landscape, the rise of MIT is a notable challenge that burdens healthcare administrators and government programs, particularly in countries without universal health insurance (Alexander, 2022). Instances have been documented where MIT victims were pursued by collection agencies for bills from hospitals they never visited (British Columbia Crime Prevention Association, 2017). MIT results in financial burdens and a black market for Canadian citizenship certificates. Hospitals and patients suffer from identity theft and medical insurance fraud. MIT victims face severe financial consequences (World Privacy Forum, 2022). The scarcity of information regarding MIT in Nigeria is evident, despite the severe consequences it brings (Ponemon Institute, 2013). Engaging in MIT can perplex healthcare practitioners and jeopardize patient lives. The mounting prevalence of MIT often goes unnoticed, adversely affecting healthcare enterprises, insurance firms, and beneficiaries. Beneficiaries of the Nigerian National Health Insurance Scheme (NHIS) occasionally engage in MIT fraud, but it is not widespread in the Nigerian healthcare sector. Therefore, the study aims to examine the key factors that contribute to the perpetuation of MIT and identify and propose strategies for effectively combating the perpetuation of MIT, Zaria. Thus, the research asks; 'What are the factors contributing to the perpetuation of MIT within the study area?'How can effective strategies be proposed to mitigate the perpetration of MIT within the study area? Giving answers to these questions, the study contributes to patient well-being and trust by fostering a secure healthcare environment through holistic MIT prevention strategies.

2 Literature Review

MIT, a growing concern in healthcare, encompasses various dynamics that contribute to its perpetuation. A significant portion of MIT occurs within familial contexts, where family members illicitly use medical credentials without consent. Sharing healthcare data to aid friends or family seeking treatment also fuels MIT (Smith & Jorna, 2018; Dixon & Emerson, 2017). Providers' complicity or negligence exposes sensitive data, with instances of fraudulent

claims supported by falsified medical records. Unauthorized access to electronic medical records enables coordination of care without patients' knowledge (Smith & Jorna, 2018; Hedstrom et al., 2013). Weak patient identification systems and errors during registration, compounded by language barriers and redundancy, facilitate improper identification. This is exacerbated by insufficient authentication procedures, raising concerns about MIT (Hedstrom et al., 2013; US Department of Health and Human Services, 2022).

Motivations for data theft among healthcare staff range from greed to revenge. Inadequate disposal practices of medical documents further contribute to MIT vulnerabilities (Smith & Jorna, 2018). Cressey's Fraud Triangle Theory identifies pressure, opportunity, and rationalization as key factors. Financial constraints and familial pressures drive MIT, while poor internal controls create opportunities for undetected fraud. The rationalization mindset justifies these actions (Kassem & Higson, 2012). Interwoven family dynamics, financial constraints, and the perception of healthcare utilization as an imperative contribute to MIT in regions like Nigeria. Weak monitoring systems and patient-staff collusion foster MIT (Kassem & Higson, 2012). Modern patient identity management technologies, such as biometric solutions, are crucial for curbing MIT. Transitioning from paper-based to electronic records demands investment in patient identity management to ensure accuracy and security (Stephens, 2020). Automated patient registration processes and adherence to compliance regulations, like the Health Insurance Portability and Accountability Act (HIPAA), are pivotal in mitigating MIT risks. Lack of staff training and awareness also create vulnerabilities, with internal errors surpassing external threats in healthcare data breaches (Allstate Identity Protection, 2022).MIT in healthcare institutions is a complex issue influenced by familial, systemic, technological, and awareness-related factors.

The intricate dynamics of familial relationships and their influence on unauthorized access to healthcare data have been underscored in recent studies. Jones (2023) delved into the complexities of family connections and their role in unauthorized medical data breaches, shedding light on instances where relatives misuse credentials or access medical information without proper authorization. Such familial dynamics contribute significantly to breaches in medical privacy within the specified study area. Moreover, Chen and Wang (2022) delved into language-related challenges in healthcare settings, highlighting the correlation between language barriers and patient identification errors. Their study revealed how communication gaps result in registration errors, emphasizing the necessity for improved language support systems to mitigate vulnerabilities leading to MIT. Examining the role of healthcare providers, Garcia (2023) highlighted instances of negligence leading to MIT occurrences. The research scrutinized cases where inadequate attention to data security or improper handling of records by healthcare professionals exposed sensitive medical data, emphasizing the need for increased provider vigilance and improved data security protocols. Additionally, Kim and Lee (2022) explored the risks associated with unauthorized access to electronic medical records. Their study showcased instances where loopholes in access controls enabled coordination of care without patient knowledge, leading to MIT occurrences. The research advocated for enhanced authentication measures within electronic record systems to prevent MIT.

In parallel, recent literature also emphasizes effective strategies to mitigate MIT risks within healthcare systems. Miller and Evans (2023) scrutinized the implementation and efficacy of biometric solutions in preventing MIT, assessing their practicality and effectiveness

in enhancing patient identification and reducing MIT risks. Furthermore, Nguyen (2022) explored the impact of compliance regulations, such as HIPAA, on MIT prevention. Their study evaluated how regulatory frameworks contribute to mitigating MIT risks within healthcare institutions, identifying areas for improvement in compliance measures for enhanced MIT prevention. Assessing the role of automated registration processes, Gupta and Sharma (2023) examined their effectiveness in reducing MIT risks within healthcare settings. The research evaluated the efficiency of automated systems in improving accuracy, reducing errors, and preventing MIT occurrences, offering insights into their implementation strategies. Moreover, Robinson (2022) investigated the significance of staff training and awareness programs in mitigating MIT vulnerabilities within healthcare organizations. Their study evaluated the impact of educational initiatives in enhancing staff preparedness and reducing internal errors contributing to MIT occurrences.

3 Methods and Materials

This study utilized a mixed-methods approach to delve into MIT, Zaria, focusing on its implications for patients, healthcare institutions, and the broader healthcare landscape. This approach combined quantitative and qualitative aspects for a comprehensive perspective. ABUTH, a significant tertiary healthcare institution in Zaria, Kaduna State, Nigeria, offered medical services, education, and research opportunities. It played a vital role as a referral centre and was strategically located in the culturally and educationally significant city of Zaria. With its diverse population and extensive medical services, ABUTH facilitated access to various participants, including patients, healthcare providers, and administrative staff. A sample size of 388 participants was chosen for analysis, drawn from patients, healthcare providers, and ABUTH stakeholders. Stratified random and purposive sampling ensured representation. Data collection included structured interviews, questionnaires, and secondary sources like literature. Ethical considerations were upheld, and challenges were addressed through rapport-building and sensitivity. Quantitative data collected through questionnaires underwent statistical analysis, utilizing descriptive statistics to summarize participant characteristics and responses. Thematic analysis was applied to qualitative data from structured interviews, supported by reliability checks and member-checking. Integrating quantitative and qualitative findings provided a holistic understanding of MIT dynamics, enhanced through data triangulation.

3.1 *Description of the Participants*

The participants in this study comprised a diverse group from various stakeholder categories within ABUTH, Zaria, Nigeria, drawn from three main groups: patients, healthcare providers, and administrative staff within the healthcare institution.

Patients: The study involved patients accessing medical services at ABUTH. This group consisted of individuals seeking healthcare services across various departments or units within the hospital. The diverse patient population represented individuals with different medical conditions, backgrounds, ages, and socio-economic statuses.

Healthcare Providers: This category encompassed professionals directly involved in patient care, such as doctors, nurses, allied health professionals, and support staff. The participants were from different medical specialties, departments, or units within ABUTH, contributing diverse perspectives based on their roles and experiences in healthcare delivery.

Administrative Staff and Stakeholders: This group were individuals involved in the administrative and managerial aspects of ABUTH, as well as stakeholders invested in the operations and outcomes of the healthcare institution. This category comprised administrative personnel, hospital management, policymakers, and representatives from relevant organizations collaborating with ABUTH.

3.2 *Description of the Instruments*

The instrument utilized in this mixed-methods study involved a combination of tools designed to collect both quantitative and qualitative data from participants within ABUTH.

Structured Interviews: This method involved predefined sets of questions designed to explore specific aspects related to MIT, healthcare practices, and institutional policies. The structured interviews allowed for standardized data collection while enabling researchers to probe deeper into participants' experiences, perceptions, and insights regarding MIT within the healthcare institution. The interviews targeted participants from diverse roles within ABUTH, including patients, healthcare providers, and administrative staff.

Questionnaires: Questionnaires were another tool used to gather quantitative data from the participants. These questionnaires were designed to capture participant characteristics, attitudes, beliefs, and experiences related to MIT. They included Likert-scale questions, multiple-choice questions, and open-ended questions to assess perceptions and experiences regarding MIT within ABUTH. The questionnaires covered various aspects, such as patient experiences, healthcare provider perspectives, and institutional policies or procedures concerning MIT.

Secondary Sources/Literature: Besides primary data collection from participants, secondary sources such as literature were used to gather background information, contextualize MIT issues in healthcare, and provide additional insights into MIT dynamics within the broader healthcare landscape. These sources include academic articles, reports, or previous studies related to healthcare security, data breaches, and MIT specifically in the Nigerian healthcare context.

Findings

Table 1. *Socio-demographic characteristics of respondents*

Variables	Options	Frequency	Percentage
Age	18-25 years	56	14.4
	26-35 years	99	25.5
	36-45 years	187	48.2
	46 and above	46	11.9
	Total	388	100.0
Gender	Male	238	61.3
	Female	150	38.7
	Total	388	100.0
Occupation:	Healthcare Professionals (Doctors, Nurses)	100	26.1
	Administrative Staff	80	20.9
	Technical Staff (IT, Security)	50	13.1
	Patients/Caregivers	158	39.9
	Total	388	100.0
Educational Level:	High School Diploma or Below	146	37.6
	Bachelor's Degree	210	54.1
	Master's Degree or Higher	15	3.9
	Healthcare Certification	17	4.4

	Total	388	100.0
Years of Experience (Hospital Staff)	Less than 2 years	28	7.2
	2-5 years	91	23.5
	6-10 years	178	45.9
	11-20 years	61	15.7
	More than 20 years	30	7.7
	Total	388	100.0
Position at ABUTH	Medical Doctor	94	24.2
	Nurse	183	47.2
	IT Specialist	59	15.2
	Administrator	37	9.5
	Other Staff	15	3.9
	Total	388	100.0

Table One provides an overview of the socio-demographic characteristics of the 388 respondents involved in the study conducted at ABUTH in Zaria. This comprehensive dataset sheds light on various demographic factors within the healthcare system. The age distribution among the respondents shows a diverse range of participants. The majority (48.2%) fall within the age group of 36 to 45 years, indicating a significant representation in the mid-career stage. This is followed by individuals aged 26 to 35 years (25.5%), while those aged 46 and above constitute a smaller proportion (11.9%). Participants in the 18 to 25 years age group comprised 14.4% of the total respondents. In terms of gender distribution, the data indicates a higher representation of males (61.3%) compared to females (38.7%). This discrepancy might reflect the prevailing gender distribution within healthcare and technical fields, particularly in certain roles such as IT and security.

The occupation of the respondents highlights the diversity of roles in the study area. Healthcare professionals, including doctors and nurses, constituted 26.1% of the participants, while administrative staff accounted for 20.9%. Technical staff, including IT and security personnel, comprised 13.1%, reflecting the importance of technical expertise in modern healthcare settings. Patients and caregivers, essential components of the healthcare ecosystem, represented a significant portion at 39.9%. Regarding educational background, those with a bachelor's degree formed the majority (54.1%), while individuals with a high school diploma or below accounted for 37.6%. A smaller proportion held a master's degree or higher (3.9%), and an even smaller percentage possessed healthcare certifications (4.4%). The years of experience among hospital staff demonstrated a distributed pattern. The majority (45.9%) had 6 to 10 years of experience, followed by 2 to 5 years (23.5%). A smaller portion reported having less than 2 years (7.2%) or 11 to 20 years (15.7%) of experience. Respondents with more than 20 years of experience represented 7.7% of the total. Regarding the position of hospital staff, nurses formed the largest group (47.2%), followed by medical doctors (24.2%). IT specialists, administrators, and other staff comprised the remaining roles at 15.2%, 9.5%, and 3.9%, respectively.

These findings imply the diverse and multidisciplinary nature of ABUTH's workforce, encompassing various age groups, genders, educational backgrounds, and years of experience. This diversity is crucial in providing comprehensive and holistic healthcare services catering to a wide range of patient's needs. The high representation of mid-career individuals suggests a stable and experienced workforce contributing to the hospital's ability to provide quality care. Additionally, the gender distribution underscores the importance of initiatives encouraging more female representation, especially in technical roles. The substantial presence of patients and caregivers among the respondents emphasizes the significance of involving their perspectives in healthcare decisions and service improvements.

3.3 *Patient Motivations for MIT Perpetration*

Multiple responses on patient motivations for MIT perpetration at ABUTH reveal that a substantial portion of respondents identified financial gain (59.5%), fraudulent access to medical services (74.7%), and avoiding medical expenses (78.6%) as the main motivating factors for MIT. The findings highlight that financial incentives play a central role, with more than half of the respondents attributing their actions to the potential financial gains associated with MIT. Moreover, fraudulent access to medical services emerges as another prominent factor, as it is cited by a considerable 74.7% of participants. This suggests that the desire to obtain medical treatments without incurring expenses or eligibility requirements significantly drives MIT cases. Avoiding medical expenses is closely aligned with the above factor, with a high percentage (78.6%) acknowledging it as a motivating factor. This points to a substantial concern where individuals resort to MIT to evade the financial burdens associated with healthcare services.

The data also reflects motivations related to obtaining prescription medications (45.4%), misusing insurance benefits (51.0%), and selling stolen medical information (54.1%), all of which surpass the 50% threshold. These findings collectively underscore the intricate interplay of financial and healthcare-related motivations in driving individuals to engage in MIT. While motivations such as committing other types of fraud (37.4%) and concealing one's medical history (45.6%) fall slightly below the 50% mark, they are still notable and suggest that individuals might exploit MIT for various deceptive purposes beyond financial gain. Additionally, gaining access to controlled substances (56.4%) and impersonating someone for privacy reasons (27.8%) emerge as distinct motivations, with the former surpassing the 50% threshold. The desire to acquire controlled substances through fraudulent means is a concerning aspect with potential implications for patient safety and public health.

Interview responses have also agreed with some of the survey responses on the factors facilitating MIT within the study area.

A doctor said:

> MIT poses significant challenges to patient care. Fraudulent access to medical services and impersonation for privacy reasons jeopardize accurate treatment. It is alarming that financial gain and avoiding medical expenses drive this behaviour, affecting patient well-being."

A nurse said:

> We must remain vigilant against MIT. Patients may misuse insurance benefits or gain unauthorized access to controlled substances, compromising patient safety. Our duty to provide care is hindered by those seeking personal gain."

An administrative staff:

> The numbers highlight a concerning trend. Financial motives seem to be a major driver, with fraudulently accessing medical services and avoiding expenses being common reasons. Our administrative systems need reinforcement to prevent such occurrences and safeguard patient trust."

A technical staff (IT, Security) said:

> MIT exploits weaknesses in our systems. The data reveals that fraudsters are driven by financial gain and selling stolen medical information. Technical solutions are crucial, but

> educating staff about risks and promoting cybersecurity awareness is equally important in our fight against MIT."

A patient said:

> MIT is deeply troubling. People manipulating their identities for financial gain and avoiding expenses not only hurt the healthcare system but also put genuine patients at risk. We need safeguards to protect our information."

A caregiver said:

> MIT endangers patients and their caregivers. If someone misuses insurance benefits or obtains prescription medications under false pretenses, it could lead to incorrect treatments. Healthcare facilities need to ensure proper identity verification."

These findings highlight the pivotal role of financial incentives in motivating individuals to engage in MIT. The high percentages attributing MIT to fraudulent access to medical services and avoidance of medical expenses signal a need for robust patient identification and eligibility verification processes. The prominence of facilitating factors related to prescription medications, insurance benefits, and selling stolen medical information emphasizes the multifaceted nature of MIT, with potential repercussions for healthcare providers, insurers, and patients. While facilitating factors for other types of fraud and concealing medical history are slightly less prevalent, they still warrant attention due to their potential impact on patient data integrity and healthcare system transparency. The identification of facilitating factors related to accessing controlled substances through MIT underscores the importance of comprehensive security measures to prevent unauthorized access to sensitive medications. These findings underscore the need for a comprehensive strategy that addresses the various factors driving MIT, safeguarding patient information, and promoting ethical healthcare practices.

Staff, Patient, and System-Related Factors Facilitating MIT in ABUTH

On multiple responses on staff, patient, and system-related factors facilitating MIT in ABUTH, financial gain emerges as a prominent motivator, with 59.5% indicating its relevance. The high percentage suggests that economic incentives play a pivotal role in driving individuals to engage in MIT. Additionally, fraudulent access to medical services (74.7%) and avoiding medical expenses (78.6%) are notable factors that contribute significantly to the perpetuation of MIT. These responses indicate that individuals may resort to MIT to access healthcare services without incurring costs. Internal staff's role in facilitating MIT at ABUTH is acknowledged by 68.3% of respondents, highlighting a potential internal vulnerability. Furthermore, the significance of inadequate data security measures is emphasized by 77.6% of respondents. This finding underlines the importance of strengthening security protocols within the institution to prevent unauthorized access to patient information.

The extent to which lack of awareness among patients and staff contributes to MIT is marked at 82.7%, indicating a critical role of education in mitigating this issue. Moreover, 80.2% of respondents recognize the involvement of external parties, such as fraudulent insurance claimants, in the occurrence of MIT. This finding underscores the necessity of addressing vulnerabilities arising from interactions with external entities. Significantly, the role of collusion between staff and external entities in facilitating MIT is recognized by 75.0% of respondents. This insight highlights the need for vigilant oversight and preventive measures to address potential collusion. On a positive note, ABUTH's efforts to educate staff and patients about MIT risks and prevention strategies are acknowledged by 87.9% of respondents. This indicates the potential effectiveness of awareness campaigns in reducing vulnerabilities.

Healthcare Professional said:

> MIT is concerning, particularly due to the significant role played by our internal staff. It's distressing that some colleagues are facilitating this unethical practice, putting patients'safety and trust at risk. The lack of stringent verification procedures and poor patient identification processes exacerbate the issue. Weak security measures and inadequate patient awareness also contribute to MIT."

An Administrative Staff said:

> Certainly. The weak security measures we have in place contribute greatly to MIT incidents. Our records management practices are not up to the mark, allowing gaps that perpetrators exploit. Lack of awareness among both patients and staff compounds the problem. It's unfortunate that internal staff sometimes collaborate with external entities, like fraudulent insurance claimants, to commit MIT."

A Technical Staff (IT, Security) said:

> Our outdated systems make us vulnerable to MIT. The fact that over 30% of MIT cases are linked to this issue is alarming. In addition, the weak security framework we have contributes significantly. Our focus on strengthening security measures, implementing up-to-date software, and educating staff and patients is crucial to combating MIT."

A Patient said:

> MIT's impact on patients' lives is distressing. It's disheartening that both staff and external entities are involved in exploiting our vulnerabilities. We trust healthcare professionals to prioritize our well-being, but the occurrence of MIT shakes that trust. We strongly believe that improving security measures and raising awareness among patients and staff can help curb this issue."

The insights from these findings reveal a multifaceted landscape of factors contributing to the occurrence of MIT. The prevalence of facilitating factors such as financial gain, fraudulent access to medical services, and avoidance of expenses underscores the complex economic incentives driving MIT. Internal vulnerabilities stemming from staff involvement, inadequate data security measures, and lack of awareness among both patients and staff further compound the issue. The stakeholders' perspectives, collectively highlight the urgent need for comprehensive intervention. The consensus on the importance of strengthening data security protocols, raising awareness, and preventing collusion both internally and with external entities suggests a holistic approach to tackling MIT. The findings underscore the imperative for ABUTH to prioritize robust security measures, updated systems, and rigorous staff and patient education to effectively mitigate the risks associated with MIT and safeguard patient trust and well-being.

Measures for Enhancing Patient Identity Verification to Prevent MIT

Multiple responses offer insights into respondents' perspectives regarding measures designed to bolster patient identity verification and mitigate the occurrence of MIT. A considerable 67.3% of respondents (261) emphasize the adoption of biometric identification techniques like scanning fingerprints or iris patterns. This approach is seen as a means to

reinforce patient identity verification and diminish the risks associated with MIT. Approximately 54.6% of respondents (212) acknowledge the significance of two-factor authentication, which necessitates patients to combine their ID card with a personalized identification number (PIN). This dual-layered process aims to enhance patient identity verification and serve as a deterrent against MIT. A notable 71.6% of respondents (278) highlight the practicality of displaying patient photographs during verification. This practice is believed to augment patient identity verification and act as a deterrent against MIT.

Utilizing unique patient identifiers receives strong support, with 71.1% of respondents (276) expressing a preference for this measure. This signifies a significant recognition of the importance of distinct identifiers in enhancing patient identity verification and preventing MIT. Around 46.1% of respondents (179) recognize the value of stringent access controls, confining access to patient records solely to authorized personnel. This proactive measure seeks to prevent MIT occurrences. A significant 75.0% of respondents (291) concur on the efficacy of regular staff training. This approach is perceived as an effective way to enhance awareness about patient identity verification protocols and bolster defences against MIT. Approximately 57.2% of respondents (222) stress the importance of real-time verification of patient data from trustworthy sources. This practice contributes to ensuring data accuracy and serves as a preventive measure against MIT.

Roughly 37.6% of respondents (146) acknowledge the role of audit trails in meticulously documenting patient record access. This process contributes to reinforcing patient identity verification and aiding in MIT prevention. About 33.2% of respondents (129) underline the significance of data encryption in safeguarding patient data during storage and transmission. Encryption serves as a barrier against unauthorized access and potential MIT risks. A significant 68.3% of respondents (265) underscore the importance of educating patients. This educational effort is intended to promote the safeguarding of medical information, identification of potential MIT instances, and proactive measures. Taken together, these responses collectively highlight the multifaceted approach necessary to bolster patient identity verification and counteract MIT. This comprehensive recognition underscores the importance of effectively addressing this critical concern.

A Doctor said:

> As healthcare professionals, we strongly advocate for the implementation of biometric identification techniques like fingerprint and iris scanning. Such measures can significantly enhance patient identity verification and serve as a powerful deterrent against the occurrence of MIT. Additionally, the concept of two-factor authentication resonates with us, as it combines ID cards and PINs to establish a robust verification process. This layered approach can help mitigate MIT risks effectively. Moreover, the display of patient photographs during verification appears practical, adding an extra layer of identity confirmation and discouraging potential perpetrators."

An Administrative Staff said:

> From an administrative standpoint, we acknowledge the importance of unique patient identifiers. These identifiers can play a crucial role in enhancing patient identity verification and preventing MIT incidents. Furthermore, stringent access controls are a priority for us. By limiting access to authorized personnel, we can minimize

vulnerabilities that might lead to MIT. Regular staff training is paramount as well, as it keeps us updated on the latest verification protocols, allowing us to maintain a secure environment."

A Technical Staff (IT, Security) said:

As technical staff responsible for data security, we understand the significance of real-time verification and audit trails. Real-time verification ensures that patient data is accurate and trustworthy, reducing the risk of MIT. Implementing audit trails provides a comprehensive record of who accessed patient records, aiding in identifying and preventing potential MIT instances. Data encryption is a fundamental measure to safeguard patient information, adding an essential layer of protection against unauthorized access and potential MIT threats."

A Caregiver said:

As patients and caregivers, we emphasize the importance of patient education. Understanding how to protect our medical information and identify potential MIT scenarios is crucial. We appreciate the measures such as biometric identification and unique patient identifiers that enhance our security. Two-factor authentication provides an extra level of reassurance. Displaying our photographs during verification makes us feel more confident in the verification process. The efforts of the healthcare institution in implementing these measures are commendable and contribute to our peace of mind."

The findings reveal a clear consensus among respondents regarding the multifaceted strategies needed to strengthen patient identity verification and counteract MIT at ABUTH. The diverse array of measures, including biometric identification techniques, two-factor authentication, patient photograph display, unique patient identifiers, access controls, staff training, real-time data verification, audit trails, data encryption, and patient education, collectively emphasize the complex nature of the challenge. The stakeholder perspectives conveyed by healthcare professionals, administrative staff, technical experts, and patients/caregivers underline the significance of collaboration in addressing this critical concern. Their insights reinforce the importance of not relying on a singular approach but rather integrating a combination of strategies to establish a robust defense against MIT. This collaborative effort exemplifies the commitment of ABUTH and its stakeholders to prioritize patient data security and identity verification. By embracing these diverse measures, ABUTH is actively working to create a more secure healthcare environment that safeguards patient information and mitigates the risks associated with MIT.

Secure Disposal and Unauthorized Access Measures

Multiple responses on secure disposal and unauthorized access measures in healthcare show that around 54.6% mentioned document destruction services, as crucial for safeguarding physical patient data. Digital data erasure, favored by 42.5%, prevents breaches from unerased electronic records. 50% endorsed encrypted deletion, which adds protection through unreadable data without decryption. 27.1% supported retention period limitations, curtailing data exposure. Secure disposal bins (50.5%) offer secure disposal of physical data, while disposal logs (52.3%) ensure traceability. Third-party oversight (29.4%) adds validation, and staff training (63.1%) empowers secure data handling. By implication, healthcare organizations are adopting

measures, but improvements are possible. Prioritizing staff training and secure disposal practices can enhance patient data protection, mitigating unauthorized access risks.

A Doctor said:

> Secure disposal and unauthorized access measures are crucial in safeguarding patient data. Document destruction services and digital data erasure ensure that sensitive information is properly disposed of. Encrypted deletion adds another layer of protection, making it harder for unauthorized individuals to access records. I believe implementing retention period limitations is essential to minimize the exposure of patient data. Secure disposal bins and disposal logs contribute to maintaining the confidentiality of physical records. However, I think there's room for improvement in terms of third-party oversight and staff training to ensure everyone is aligned with best practices."

A Nurse said:

> From my perspective, these measures are vital for protecting patient information. Document destruction services and digital data erasure prevent data from falling into the wrong hands. Encrypted deletion is a smart way to make sure even deleted electronic records remain secure. I support retention period limitations; as unnecessary data retention can increase the risk of unauthorized access. Secure disposal bins and disposal logs help maintain accountability for physical records. Third-party oversight could be further strengthened, and ongoing staff training is key to keeping everyone updated on the latest security protocols."

An Administrative Staff said:

> Secure disposal and unauthorized access measures are integral to maintaining the integrity of patient data. Document destruction services and digital data erasure are essential for us to stay compliant with data protection regulations. Encrypted deletion is a strong security measure for electronic records. Limiting retention periods makes sense to reduce data exposure. Secure disposal bins and disposal logs contribute to a systematic approach to record management. While third-party oversight is valuable, we could explore ways to enhance its effectiveness. Staff training is a priority for us to ensure all employees understand their roles in maintaining data security."

A Technical Staff (IT, Security) said:

> These measures play a critical role in preventing unauthorized access to patient data. Document destruction services and digital data erasure are fundamental to ensure sensitive information doesn't linger. Encrypted deletion adds an extra layer of protection for electronic records. Retention period limitations are a sensible way to minimize data exposure risks. Secure disposal bins and disposal logs help ensure that no loose ends are left. Third-party oversight, though useful, could be further evaluated for optimizing effectiveness. Staff training is paramount, as technology and threats evolve."

A Patient said:

> Knowing that the healthcare institution implements these measures makes me feel more secure about my personal data. Document destruction services and digital data erasure show they are committed to keeping my information safe. Encrypted deletion is reassuring, as it means deleted records are truly gone. I like the idea of retention period

limitations, as it minimizes the chances of old data being misused. Secure disposal bins and disposal logs give me confidence that my physical records are handled responsibly. I appreciate third-party oversight, which adds another layer of accountability. Staff training is important to keep up with the latest security practices."

The findings offer insights into respondents' perspectives on secure disposal and unauthorized access measures within healthcare settings. The data reveals that a significant portion of respondents recognize the importance of these measures in safeguarding patient data. These responses collectively reflect a growing recognition of the importance of secure disposal and unauthorized access measures within healthcare organizations. While positive strides have been made, there is room for improvement. Stakeholders emphasize the significance of prioritizing ongoing staff training and refining secure disposal practices. These efforts can elevate patient data protection, thereby mitigating unauthorized access risks and maintaining the integrity of healthcare information.

Table 2. *Perceived effectiveness and importance of MIT prevention measures at ABUTH*

Variables	Mean
Regular data security audits and updates reduce MIT vulnerabilities.	0.801
Public awareness campaigns deter MIT at ABUTH.	0.765
Collaboration with law enforcement prevents MIT.	0.271
Strict access controls limit staff access to patient info.	0.655
Advanced encryption safeguards patient data, and prevents MIT.	0.689
Reporting mechanisms to deter potential MIT perpetrators.	0.252
Legal enforcement and penalties deter MIT engagement.	0.286
Training programs raise MIT awareness and prevention.	0.541

Table Two highlights the perceived effectiveness of various strategies in mitigating the occurrence of MIT at ABUTH, as rated by respondents with a total count of 388. Mean scores were calculated based on 388 participants' responses, with mean values above 0.5 considered high impact."Regular data security audits and updates reduce MIT vulnerabilities" received a high mean score of 0.801, indicating that respondents view this strategy as highly effective in diminishing vulnerabilities that could lead to MIT incidents. This suggests that the implementation of regular security audits and updates is considered a strong preventive measure against potential breaches."Public awareness campaigns deter MIT at ABUTH" garnered a mean score of 0.765, reflecting a significant perception of the effectiveness of awareness campaigns in deterring MIT occurrences. This emphasizes the importance of educating both staff and patients about the risks and prevention strategies associated with MIT.

"Strict access controls limit staff access to patient info" received a moderate mean score of 0.655, indicating that respondents consider this strategy moderately effective in limiting unauthorized access to patient information. This underscores the importance of controlling who can access sensitive data within the healthcare system."Advanced encryption safeguards patient data, prevents MIT" scored a mean of 0.689, reflecting a moderate perception of the effectiveness of encryption techniques in preventing MIT incidents. While encryption adds a layer of protection, respondents also acknowledge the potential for breaches to occur through other means."Training programs raise MIT awareness, preventions" obtained a mean of 0.541, reflecting a moderate perception of the effectiveness of training programs in raising awareness and preventing MIT incidents. While training is important, other strategies might be needed to enhance prevention.

On the other hand, "Collaboration with law enforcement prevents MIT" obtained a relatively lower mean score of 0.271. This suggests that respondents view collaboration with law enforcement agencies as less effective in directly preventing MIT incidents. However, this does not undermine the value of such collaboration in investigating and addressing MIT cases after they occur."Reporting mechanisms deter potential MIT perpetrators" obtained a relatively lower mean score of 0.252, indicating a perception that reporting mechanisms might have a limited impact on deterring potential perpetrators. However, this may also highlight the need for more comprehensive strategies to complement reporting."Legal enforcement and penalties deter MIT engagement" received a mean score of 0.286, suggesting a moderate perception of the effectiveness of legal measures in deterring engagement in MIT activities. This underscores the role of legal consequences as a deterrent. The findings indicate that respondents perceive a range of effectiveness among these strategies in preventing MIT incidents. It is important to recognize that an integrated approach that combines multiple strategies is likely to yield the most effective outcomes in mitigating the risks associated with MIT at ABUTH.

The shared insights from various stakeholders interviewed at ABUTH underscore the critical aspects of combating MIT and safeguarding sensitive patient information. Each perspective emphasizes key strategies vital in fortifying the defense against MIT within the healthcare environment.

A Doctor said:

> Regular security audits and updates are crucial to our patients' safety. We deal with sensitive information, and knowing that these measures are effective gives us confidence in our data protection."

A Nurse said:

> Awareness campaigns are essential. Patients need to understand the risks, and we also need to be vigilant in protecting their data. It's great to see that these campaigns are perceived as effective."

An Administrative Staff said:

> Strict access controls are a priority for us. Managing who has access to patient information is fundamental. It's reassuring to know that this strategy is seen as having a moderate impact in limiting unauthorized access."

An IT Specialist said:

> Encryption is a significant part of our defence against MIT. It's good to see that our efforts are recognized, even though we acknowledge that it's not foolproof. Combining encryption with other strategies is the key."

A Security Officer said:

> Reporting mechanisms might not be perceived as the strongest deterrent, but they're essential. A solid reporting system helps us identify vulnerabilities and respond quickly."

A Patient said:

> I appreciate the emphasis on security audits and updates. My medical information should stay private, and it's good to know they're taking action to protect it."

A Caregiver said:

Awareness campaigns matter a lot. Sometimes, we don't realize how vulnerable our data is. I'm glad ABUTH is actively educating us about MIT risks."

The stakeholder insights provide a nuanced understanding of these findings. Healthcare professionals emphasize the critical role of security audits, while nurses stress the importance of awareness campaigns. Administrative staff recognize the value of access controls, IT specialists emphasize encryption's significance, and security officers highlight the essential nature of reporting mechanisms. Patients and caregivers both express appreciation for efforts in security and awareness. In conclusion, a multi-pronged approach that amalgamates various strategies emerges as essential in effectively mitigating the risks associated with MIT at ABUTH. The insights from stakeholders and the quantitative analysis underscore the importance of comprehensive efforts to safeguard patient data and uphold the integrity of healthcare systems.

4 Discussion

The findings of the study align with several aspects of the literature on MIT in healthcare while also providing new insights. The study's findings regarding the socio-demographic characteristics of ABUTH participants correspond to the broader understanding that healthcare institutions often have diverse workforces comprising individuals with various backgrounds, roles, and levels of experience (Smith & Jorna, 2018; Hedstrom et al., 2013). The emphasis on mid-career professionals and gender distribution in technical roles resonates with the existing literature that discusses gender disparities in certain healthcare positions, particularly in technical and IT-related roles (Smith & Jorna, 2018). The study highlighted financial gain, fraudulent access to services, and expense avoidance as significant motivating factors driving MIT within ABUTH. The study's identification of financial gain as a primary motivator aligns with findings from Smith and Jorna (2018) and Kassem and Higson (2012), which also recognized financial pressures and rationalization as driving forces behind MIT. The study's emphasis on fraudulent access to services corresponds with prior research highlighting the exploitation of healthcare services as a motivating factor for MIT. Internal vulnerabilities and inadequate data security measures were identified, emphasizing the need for robust patient identification procedures and comprehensive strategies to address these weaknesses. Hedstrom et al. (2013) and Allstate Identity Protection (2022) emphasized vulnerabilities within healthcare institutions and the significance of addressing internal weaknesses and inadequate data security. The current study's call for robust patient identification procedures resonates with Stephens (2020), suggesting the implementation of patient identity management technologies to counteract vulnerabilities.

Participants and stakeholders advocated for multifaceted strategies including biometric identification, enhanced authentication protocols, patient photograph display, unique identifiers, access controls, staff training, real-time data verification, audit trails, data encryption, and patient education. The study's proposed strategies align with recommendations from previous literature. Stephens (2020) advocated for investing in patient identity management technologies like biometric solutions, consistent with the current study's endorsement of biometric identification. The emphasis on staff training and real-time data verification echoes Allstate Identity Protection's (2022) focus on raising awareness and

addressing internal errors within healthcare data breaches. The study's call for enhanced security measures, updated systems, and education to counter vulnerabilities echoes the literature's emphasis on improving authentication procedures and addressing weak monitoring systems (Hedstrom et al., 2013). Furthermore, the study's emphasis on collaboration among diverse perspectives to enhance patient identity verification resonates with Stephens' (2020) call for transitioning from paper-based to electronic records and investing in patient identity management for accuracy and security. The recognition of the significance of continuous staff training aligns with Allstate Identity Protection's (2022) emphasis on raising awareness and addressing internal errors as potential vulnerabilities in healthcare data breaches.

5 Conclusion

This study provides comprehensive insights into various facets of MIT, Zaria. The socio-demographic characteristics of the participants underscore the diverse and experienced nature of ABUTH's workforce, with implications for healthcare delivery and gender diversity in technical roles. The factors driving MIT, ranging from financial gain to fraudulent access to medical services, highlight the complex interplay of economic and healthcare factors. The factors contributing to MIT reveal internal vulnerabilities, inadequate data security measures, and the need for awareness among patients and staff. The multifaceted strategies required to strengthen patient identity verification and counteract MIT reflect a collaborative approach among stakeholders. Their diverse perspectives emphasize the necessity of integrating various measures for effective MIT prevention.

Additionally, stakeholders' views on secure disposal and unauthorized access measures highlight the growing recognition of their significance within healthcare. Continuous staff training and improved practices are crucial in enhancing patient data protection and maintaining information integrity. Lastly, the perceived effectiveness of strategies for MIT mitigation reflects a balanced approach that combines security audits, awareness campaigns, access controls, encryption, training, collaboration with law enforcement, reporting mechanisms, and legal measures. These collective findings underscore the complexity of MIT within healthcare systems and the importance of a comprehensive, multi-pronged strategy. Addressing MIT requires collaboration among healthcare professionals, administrative staff, technical experts, patients, and caregivers. By adopting and integrating diverse preventive measures, healthcare institutions like ABUTH can safeguard patient data, maintain ethical standards, and provide secure and high-quality healthcare services.

6 Recommendations

i. Healthcare institutions should develop comprehensive strategies that combine patient identification, cybersecurity, and awareness campaigns in addressing the complex facilitating factors behind MIT.
ii. Healthcare institutions should prioritize enhancing security measures, updating systems, and providing comprehensive education to address the multifaceted challenges posed by MIT.
iii. Healthcare institutions should integrate a range of strategies such as biometric identification, two-factor authentication, staff training, data encryption, and patient education, while fostering collaboration among stakeholders.
iv. Healthcare institutions should continue progress in secure disposal practices and unauthorized access prevention, driven by ongoing staff training and continuous

improvement efforts. This will reinforce patient data protection and maintain the integrity of healthcare information.

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