

Systematic Review of Patient Experiences and Perspectives on Wearable Seizure Monitoring Technologies in Epilepsy Health Information Systems Care

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Abstract

The study investigate patient experiences and perspectives related to the use of wearable seizure monitoring devices in epilepsy. The researcher performed a qualitative systematic literature review using PRISMA study design and utilized SPIDER search strategy in order to identify articles published from 2010-2023 from various databases including Science Direct, PubMed and MEDLINE. Additionally, quality was assessed through the use of Critical Appraisal Skills Programme (CASP) checklist. Lastly, 12 qualifying qualitative studies were included in the review after meeting predetermined inclusion criteria. A total of 2207 studies were identified through PRISMA search while only 12 studies meeting the inclusion criteria were included in this review. Thematic analysis allowed researchers to identify six main themes which revealed patients' viewpoints regarding wearable seizure monitoring devices. This systematic review underscores the positive user experience associated with wearable seizure monitoring devices among individuals with epilepsy. The results highlight the benefits perceived by users including improved safety and well-being and indicated that wearable seizure monitoring technology can enhance the management of epilepsy and improve the quality of life for affected individuals.

Keywords: *Wearable, seizure, devices, patients, monitoring, epilepsy*

1. INTRODUCTION

Wearable gadgets are gaining popularity with patients today in terms of monitoring health (Seffah et al., 2023). Some wearable gadgets designed to keep tabs on seizures among epilepsy patients present a huge opportunity for early recognition, prevention and quick medical attention (Brinkmann et al., 2021). Epilepsy is a neurological condition that is distinguished by the occurrence of recurrent seizures (Owczarek & Jędrzejczak, 2013). The monitoring of seizures plays a pivotal role in the management of epilepsy as it offers significant insights into the patterns of seizures and improves the safety of patients (Stirling et al., 2021). Wearable devices designed for monitoring seizures hold the potential to facilitate early detection and notification of seizures, enabling users to adopt necessary preventive measures and promptly seek medical attention (Bruno et al., 2018; Hao Qu & Gotman, 1997). The effectiveness of these devices in collecting and documenting seizure activity has been demonstrated through patient experiences, hence yielding significant data for patients and healthcare professionals alike (Thompson et al., 2019). The ability to monitor seizures in real-time and accurately detect them has provided patients with a more comprehensive comprehension of their illness, allowing them to identify probable triggers and make well-informed decisions on their treatment strategies (Beniczky et al., 2018).

The majority of patients hold favourable views on the utility and convenience of wearable seizure monitoring equipment (Atwood & Drees, 2021; Rylvlin et al., 2018). These devices are frequently designed to be inconspicuous and

lightweight, enabling users to wear them without discomfort during their everyday routines, thus minimising any disruption to their regular activities (Stirling et al., 2020; Tilley et al., 2017). Some patients express their satisfaction with the user-friendly nature of these devices since they can be readily customised and tailored to cater to their requirements (Andrews et al., 2020; Simblett et al., 2020). The capacity to synchronise data with smartphone applications or cloud-based systems promotes convenience, facilitating seamless access to seizure logs and facilitating the exchange of information with healthcare practitioners (Soroudi et al., 2019; van Andel et al., 2015).

The experience of living with epilepsy can present emotional difficulties, and research has indicated that the utilisation of wearable seizure monitoring devices can have a beneficial effect on the psychological well-being of individuals affected by this condition (Arends et al., 2018). Romero-Osorio et al., (2018); Ryvlin & Beniczky (2018) pointed out that the devices offer a sense of security by promptly notifying carers or loved ones in the event of a seizure, therefore mitigating feelings of worry and insecurity.

Although wearable seizure monitoring systems have demonstrated potential benefits, patients have reported encountering various obstacles and restrictions (Herrera-Fortin et al., 2021). The challenges include false alarms and instances of missed seizures continue to be a subject of concern since these occurrences have the potential to cause unneeded distress or hinder prompt action (Arends et al., 2018; Jory et al., 2016). Moreover, the financial implications of acquiring these devices and the accompanying subscription fees may provide economic challenges for many individuals seeking medical assistance (Oto, 2017).

The purpose of this study is to present healthcare professionals and policymakers with empirical information, based on the experiences of patients, in order to guide the ongoing, the implementation of remote healthcare models and foster public confidence in their acceptance wearable seizure monitoring devices.

Aims and objectives

This systematic review aims to comprehensively investigate patient experiences and perspectives related to the use of wearable seizure monitoring devices in epilepsy management.

- To identify and synthesize existing literature on patient-reported experiences with wearable seizure monitoring devices.
- To explore the experiences of epilepsy patients using wearable devices, including daily life benefits and challenges in monitoring seizures.

Research questions

What is the experience and perspective of epileptic patients in using wearable seizure monitoring?

Rationale

The rationale of this systematic literature review is to investigate the benefits as well as challenges faced by patients while using wearable seizure monitoring devices in epilepsy. This study seeks to gain a thorough knowledge of the patient experience and perception and thereby suggest areas that require more investigation by analysing the available literature. Therefore, this study can contribute to identify the key factors that essential for improving patient-centred care in seizure management and guiding the development of more user-friendly and effective wearable devices for the management of seizure.

2. METHODOLOGY

A qualitative systematic literature review, following the PRISMA study design, was undertaken from 2010 to 2023. This study utilized a qualitative systematic literature review approach to amalgamate insights from various qualitative studies focusing on user experiences and perception with wearable seizure devices.

Search Strategy

The Sample, Phenomenon of interest, design, evaluation, research type (SPIDER) search strategy was utilised in identifying the relevant articles for the study (Eriksen & Frandsen, 2018). It is commonly employed in clinical or medical intervention research (Frandsen et al., 2020). The search strategy was used to discover relevant papers for the study and evidence-based practice. The SPIDER is an alternative tool to the frequently used PICO (Yensen, 2013). An extensive search of pertinent electronic databases was conducted, encompassing ScienceDirect, PubMed and MEDLINE with the time frame of 2010 to 2023. A comprehensive search strategy was devised using a diverse range of search term which includes "wearable device OR patients with epilepsy" AND "Patient Experience with Seizure device", "Seizure monitoring", "Wearable seizure devices" and "User experience on seizure devices", "Smart Monitoring OR Smart watch " AND Seizure. And " Epilepsy"

Eligibility criteria

This study included qualitative research conducted in the UK from 2010 to 2023, focusing on patient experiences with wearable seizure monitoring in epilepsy. The review was limited to English peer reviewed qualitative study only. The study excluded quantitative studies and studies pertaining to healthcare practitioners' perspectives on wearable seizure monitoring. The selected studies were assessed for inclusivity using the SPIDER. The table below shows how the SPIDER tool was applied.

Sample	Patients using seizure devices in the UK
Phenomenon of interest	Epileptic seizures
Design	Qualitative studies
Evaluation	Experience, views of patients
Research type	Qualitative research

Table 1: Spider too

CASP Questions	1	2	3	4	5	6	7	8	9	10	11	12
1. Was the research question or objective stated clearly?	y	y	y	y	y	y	y	y	Y	y	y	y
2. Was the study design appropriate to address the research question?	y	y	y	y	y	y	y	y	Y	y	y	y
3. Did the study sample provide a representative view of the population?	y	y	y	y	y	y	y	y	y	y	y	y
4. Was the data collection method appropriate and	y	y	y	y	y	y	y	y	y	y	y	y

reliable?												
5. Was the statistical analysis appropriate?	y	y	y	y	y	y	y	y	y	y	y	y
6. Were the conclusions supported by the results of the analysis?	y	y	y	y	y	y	y	y	y	y	y	y
7. Was there any potential for bias?	n	n	n	n	n	n	y	n	n	y	y	n
Total Score	7	7	7	7	7	7	6	7	7	6	6	7

Table 2: CASP

Key: y(yes), n: (no), c: (can't tell)

1 (Schulze-Bonhage et al., 2010), 2 (Jory et al., 2016), 3 (Tovar Quiroga et al., 2016), 4 (Bruno et al., 2018), 5 (Simblett et al., 2020), 6 (Bruno et al., 2020), 7 (Simblett et al., 2019), 8 (Moss et al., 2022), 9 (Bruno et al., 2021), 10 (Beck et al., 2020), 11 (Herrera-Fortin et al., 2020) and 12 (Naganur et al., 2022).

Synthesis and data Extraction

Data synthesis and extraction are essential and pivotal process in the execution of a systematic literature review. It entails the procedure of collecting pertinent data from the research incorporated in the review. The objective of this stage is to gather and arrange the data, which will be utilised in the analysis and synthesis of the review. Results gathered from the data base were manually screened and filtered to remove any duplication of patient experiences and perspectives on wearable seizure monitoring in epilepsy. The Critical Appraisal Skills Programme (CASP) method was used to assess and evaluate the quality of studies included in the review (Long et al., 2020). The method considered the strengths and limitations of the study review to make informed decisions. The method listed 6 components, and the data collected for CASP is shown above. The flow of the data extraction process was done using the PRISMA procedure in figure 1 below.

Data Analysis

The study used thematic analysis to extract and categorise themes from the selected studies. The reason for using thematic analysis was to identify patterns and underlying meanings within the data (Castleberry & Nolen, 2018). Kiger and Varpio (2020) allude, the analysis involved data collection, data familiarisation, coding, development of themes, reviewing and refinement, and reporting. In this study, all the 12 articles were scrutinised for the identification of repeated concept and patterns and were categorised to codes. Themes were initially formulated and subsequently refined through a meticulous review of the coded extracts (Braun & Clarke, 2006).

3. RESULTS

The study search resulted a total of 2207 after the exclusion of the duplicate studies and after reviewing the studies against the eligibility criteria a total of 12 studies were selected for the final review from the 3 databases. The PRISMA flow framework was used in the search and detailed in Fig. 1 below.

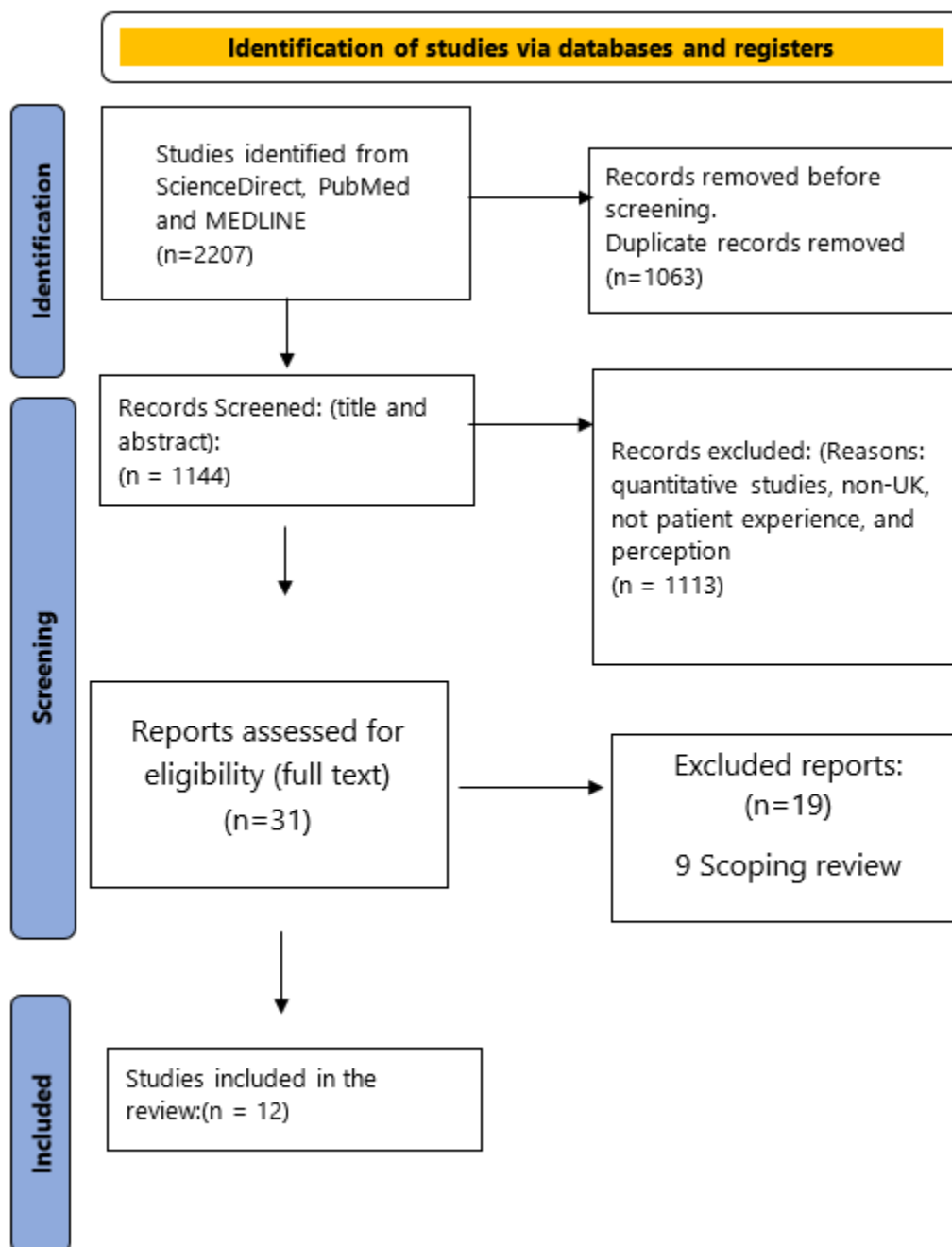


Figure1 Prisma flow chart

Study Characteristics

The characteristics of the studies has been provided in the Table:3 below.

NO.	Authors	Method	Findings
1	Schulze-Bonhage et al., 2010	Qualitative	The study results revealed that only a few patients were willing to wear EEG electrodes.
2	Jory et al., 2016	Qualitative	The majority of the devices examined in this study were primarily concerned with detecting alterations in movement and/or physiological indicators, relying on an algorithmic approach to establish threshold values. None of the devices exhibited the capability to accurately identify all instances of seizures, hence presenting a challenge in terms of both false positives and instances of seizures that were not detected. A considerable portion of the research used a limited sample size or just focused on a small number of seizure instances.
3	Tovar Quiroga et al., 2016	Qualitative survey	The participants showed a notable level of concern over the possibility of seizures being unnoticed. The influence of this particular issue on sleep and daily functioning was of a modest nature. There exists a notable level of interest in the use of Seizure Detection Devices (SSDs). The majority of individuals use SDD regularly.
4	Bruno et al., 2018	Qualitative survey	Several patients showed a willingness to utilise a wearable device for long-term monitoring of seizures. Those who do not use wearables expressed their decision as being influenced by a lack of clarity regarding the efficacy of such devices in the context of epilepsy management. Notwithstanding apprehensions about precision, safeguarding of data, and technical assistance, these considerations did not impede patients' inclination to adopt digital technology.
5	Simblett et al., 2020	Qualitative case study	The participants expressed a high level of convenience in using the devices, demonstrating a willingness to wear them during their hospital stay and willingly sharing the data generated from the devices with both researchers and medical experts. Nevertheless, the inclusion of cables, substantial dimensions, discomfort, and need on external assistance have mitigated the overall user experience. The participants' perceptions

			on the incorporation of these items into their daily routines were significantly shaped by their visibility and perceived level of accuracy.
6	Bruno et al., 2020	Qualitative	The devices exhibited a high level of stability while worn on the body, even in the presence of convulsions. In general, all of the devices were deemed to be pleasant to wear, even during periods of sleep.
7	Simblett et al., 2019	Qualitative	The patients demonstrated a keen interest in utilising mHealth technology as a clinical detection tool, namely to facilitate communication with their healthcare providers on the incidence of seizures. Additional proposed applications encompass the capability to forecast or mitigate seizures, as well as enhance self-regulation.
8	Moss et al., 2022	Qualitative	The study reported on the functionality of detection devices. Participants reviewed concerns with issues of privacy and effectiveness in detecting seizures.
9	Bruno et al., 2021	Qualitative	The study results highlighted that patients experience comfort and ease of use when using seizure detectors.
10	Beck et al., 2020	Qualitative review	The study identified three themes, leading to the conclusion that participants' expectations of wearable technologies were shaped by factors that significantly affected their personal lives and self-perception. These themes were: making invisible situations visible, sharing responsibility for moments that are not easily recognised, and experiencing a sense of companionship in a challenging life.
11	Herrera-Fortin et al., 2021	Qualitative survey	The primary concerns expressed by the respondents were related to the occurrence of false negatives, the level of comfort, and the associated costs. The participants expected that the use of seizure detection would lead to enhancements in both their quality of life and quality of care. Furthermore, they expressed a sense of assurance in their proficiency to effectively utilise a seizure detector.
12	Naganur et al., 2022	Qualitative review	A total of 1269 patients suffering from tonic-clonic seizures using wrist and ankle-detecting seizure devices reported that the devices had high sensitivity.

Table 3: Study Characteristics

4. THEMES

The study identified 6 main themes namely Security of seizure devices, Knowledge on seizure behaviour, Trustfulness, Safety, Discomfort, Accuracy and reliability. From these main themes, various sub themes were revealed and shown in Table 4 below:

Main Themes	Sub Themes	Minor Themes
Security of seizure devices	<ol style="list-style-type: none"> 1. A sense of security 2. Data security and privacy 	<ol style="list-style-type: none"> 1. The security of seizure devices 2. Data security and privacy 3. Incorporate robust security protocols.
Knowledge on seizure behaviour	<ol style="list-style-type: none"> 1. Knowing your condition 2. Information 3. Understanding the medical state 4. Evaluate treatment methods 	<ol style="list-style-type: none"> 1. Navigate their medical situation appropriately. 2. Offering patients with significant information 3. Acquiring a greater understanding of their medical state 4. To evaluate the effects of various treatment methods
Safety	<ol style="list-style-type: none"> 1. Prompt notifications 2. Feeling safe 3. Anxiety 4. Independence and freedom 	<ol style="list-style-type: none"> 1. Identify seizures and promptly notify carers or emergency services. 2. The feeling of safety and peace 3. Notable levels of anxiety due to the unexpected nature of seizures 4. Enhanced independence and freedom 5. A sense of security
Trustfulness	<ol style="list-style-type: none"> 1. Lack of trust 2. Perceived dependability 	<ol style="list-style-type: none"> 1. Notable concern due to false alarms 2. Distress
Discomfort	<ol style="list-style-type: none"> 1. Discomfort 2. Inflammation, itchiness and allergy 3. Freedom of movement 4. Restrictions on social activities 5. Emotional effect 	<ol style="list-style-type: none"> 1. Physical discomfort 2. Induces inflammation, itchiness, or even allergy 3. Impeding freedom of movement 4. Imposed restrictions on

	6. Maintenance and management	patients' social activities 5. Emotional effect 6. Regular maintenance and management
Accuracy and reliability	1. False alerts 2. Reliability 3. Accuracy	1. High level of reliability in their experiences 2. Frequency of accuracy-related problems 3. Duration of battery performance 4. Durability is an additional Consideration 5. Occurrence of false alarms

Table 4: Summary of Themes

Security of seizure devices

The sense of security that seizure devices bring among patients is of utmost importance. Patients highlighted that their devices possess a high level of dependability and precision, hence delivering prompt notifications to carers in the event of an imminent seizure (Bruno et al., 2018; Herrera-Fortin et al., 2021; Schulze-Bonhage et al., 2010). The use of these devices instils a sense of security, enabling patients to do their daily routines, follow personal interests, fulfil educational or occupational obligations, and even go on journeys (Herrera-Fortin et al., 2021; Jory et al., 2016; Simblett et al., 2020).

Patients also place significant emphasis on the importance of data security (Herrera-Fortin et al., 2021; Moss et al., 2022; Schulze-Bonhage et al., 2010; Simblett et al., 2019). Individuals anticipate that their personal information will be maintained and safeguarded securely, ensuring protection against unauthorised access (Bruno et al., 2018; Jory et al., 2016). Manufacturers are currently engaged in proactive efforts to incorporate robust security protocols, including encryption and secure cloud storage, to effectively tackle these concerns and uphold the confidentiality of user data.

Knowledge on seizure behavior

A clear understanding of one's illness is crucial for patients to navigate their medical situation appropriately. Bruno et al., (2018) study noted that patients make well-informed decisions regarding their treatment options, lifestyle changes, and potential seizures by acquiring knowledge about the condition. This enables patients to assume authority over their well-being and engage actively in their healthcare. Seizure devices play a crucial role in offering patients significant information regarding their medical state (Beck et al., 2020; Schulze-Bonhage et al., 2010).

Seizure devices facilitate patients in acquiring a greater understanding of their medical state by the augmentation of their awareness and monitoring capacities (Beck et al., 2020; Bruno et al., 2018). Patients noted that these devices can record and monitor the occurrence, duration, and severity of seizures and by utilising this dataset, they detect recurring patterns and possible triggers that could have previously evaded detection (Beck et al., 2020; Bruno et al., 2018). This acquired understanding enables individuals to proactively implement strategies to prevent triggers and reduce the frequency of seizures (Moss et al., 2022).

Seizure devices further contribute to the appraisal and assessment of the efficacy of therapeutic interventions. Beck et al., (2020); Bruno et al., (2018); and Walker et al., (2019) patients expressed that through the continuous monitoring of seizure activity, they can evaluate the effects of various treatment methods, modifications in medication, or changes in

their lifestyle. The presence of this feedback loop facilitates the ability of both patients and healthcare practitioners to make well-informed decisions regarding treatment plans and modifications, eventually resulting in improved results (Beck et al., 2020; Schulze-Bonhage et al., 2010).

Walker et al., (2019) patients noted that seizure devices provide them with a means to get objective data that could be readily shared with their healthcare practitioners. The presented data provides a full overview of the patient's seizure activity, offering useful insights that may be utilised to influence decisions regarding therapy (Moss et al., 2022). Through the utilisation of this data, healthcare practitioners can customise treatment strategies based on the unique requirements of each patient, resulting in enhanced efficacy and personalised healthcare (Bruno et al., 2020; Bruno et al., 2021).

Safety

Patients in studies conducted by Herrera-Fortin et al., (2021); Jory et al., (2016); Simblett et al., (2020) expressed that the guarantee of prompt assistance after a seizure instils a feeling of safety and peace, particularly among individuals who live alone or regularly lack companionship.

Bruno et al., (2018) and Simblett et al., (2020) noted that seizure devices effectively reduce fear among patients by continually monitoring the user's physiological signals and swiftly notifying their carers upon seizure detection. This proactive strategy assists persons in re-establishing a sense of agency over their illness and mitigates the fear associated with suffering a seizure without aid (Herrera-Fortin et al., 2021).

One of the foremost benefits of seizure devices is the enhanced independence and freedom they provide (Bruno et al., 2018; Herrera-Fortin et al., 2021). Research findings have demonstrated that individuals are no longer completely dependent on the presence of others to ensure their safety (Bruno et al., 2018).

Trustfulness

In studies, by Moss et al., (2022); Simblett et al., (2020) patients expressed concerns over the precision and efficacy of these devices, harbouring fears about their potential inability to identify or appropriately respond to seizures promptly.

Also, Andrews et al., (2020) identified that patients often experience a notable concern due to false alarms, which, therefore, results in a diminished level of confidence in seizure equipment. The occurrence of many false alarms can elicit distress and disruption, leading to unwarranted worry and exerting a negative influence on the overall quality of life (Bruno et al., 2018; Schulze-Bonhage et al., 2010). Studies by Bruno et al., (2018); Herrera-Fortin et al., (2021); and Schulze-Bonhage et al., (2010) reviewed those patients exhibit reluctance in using or depending on these devices as a result of fear over the persistent occurrence of inaccurate alerts, hence potentially exerting a detrimental impact on their psychological welfare.

Moreover, some patients hold the belief that seizure devices are incapable of precisely capturing and documenting the whole magnitude of their seizure activity, hence impeding their access to suitable medical care and treatment (Bruno et al., 2021; Tovar Quiroga et al., 2016). This constraint has the potential to produce feelings of irritation and undermine users' trust in these technological products.

Another additional factor that influences patients' confidence in seizure devices is the apparent absence of a user-friendly interface. Some patients in the studies by Simblett et al., (2020); and Tovar Quiroga et al., (2016) encounter difficulties in navigating and configuring these devices, resulting in a diminished sense of self-assurance in their capacity to use them proficiently. The intricacy of the device's interface and the lack of explicit guidance might additionally augment patients' scepticism.

Discomfort

Patients in Moss et al., (2022); Simblett et al., (2020) expressed that the utilisation of a seizure device may occasionally result in physical discomforts, such as skin irritation. The persistent use of the device, usually worn on the wrist, induces inflammation, itchiness, or even allergy (Simblett et al., 2020). The device's weight and size further contribute to discomfort, hence posing challenges in the execution of regular duties without impediment.

Some patients noted that seizure devices were specifically engineered to be worn continuously, hence impeding their freedom of movement (Bruno et al., 2018; Herrera-Fortin et al.,2021). The requirement for continuous use of devices-imposed restrictions on patients' participation in specific physical activities, such as swimming or contact sports (Bruno et al., 2018). This limitation has the potential to exert pressure on individuals' physical and mental well.

Moreover, the persistent reminder to wear a seizure device was seen to have an emotional effect by some patients (Simblett et al., 2019). The physical manifestation of the disease produced emotions of self-consciousness. The existence of the device also induced feelings of fear, as patients experienced concern over the potential public impression or judgement they encountered (Bruno et al., 2018; Simblett et al., 2020).

Other patients from Simblett et al., (2020) further expressed that regular maintenance and management of seizure devices contribute to their discomfort to continue wearing the devices. The process of replacing batteries, performing cleaning tasks, and assuring optimal functionality of the devices was observed by patients to be a time-intensive job that has the potential to disrupt one's regular routines (Bruno et al., 2021; Herrera-Fortin et al.,2021). The potential imposition of this further obligation might potentially have adverse effects on the patient's holistic state of health.

Accuracy and reliability of seizure-detecting devices

The accuracy of seizure devices has exhibited substantial disparities across different persons (Jory et al., 2016; Simblett et al., 2020; Simblett et al., 2019). Some patients have reported a high level of reliability in their experiences, with a low occurrence of both false positives and false negatives (Herrera-Fortin et al.,2021; Moss et al., 2022). Some patients have reported on high frequency of accuracy-related problems and have often been subjected to false alarms, resulting in unwarranted levels of stress and irritation (Bruno et al., 2018).

Patients frequently expressed worries regarding the duration of battery performance, particularly in circumstances where the wearable device necessitates prolonged usage or is exposed to activities such as swimming or washing (Simblett et al., 2020). Durability is an additional consideration, as patients show a preference for devices that have strong designs and can endure the stresses of daily usage without suffering to wear and tear (Herrera-Fortin et al.,2021).

Moreover, patients frequently raised the issue of false alerts questioning device reliability (Bruno et al., 2018; Jory et al., 2016; Tovar Quiroga et al., 2016). Although these devices are intended for seizure detection, they can generate false alerts for patients in the absence of an actual seizure event (Simblett et al., 2019). The occurrence of false alarms can lead to disruptions and inconveniences, resulting in patients developing desensitisation and scepticism towards the device's efficacy (Herrera-Fortin et al.,2021; Moss et al., 2022).

5. DISCUSSION

The study found that patients preferred wearable devices for seizure monitoring due to their inconspicuous features and user-friendly interface, indicating a positive perception of wearable devices among individuals with epilepsy (Andrews et al., 2020; Appelboom et al., 2014). The non-invasive features of epilepsy devices have been found to reduce social disapproval and improve the overall acceptability of those using them (Arends et al., 2018; Beck et al., 2020). Consumers highly appreciate the real-time monitoring capabilities provided by wearables, as they enable immediate action and enhance safety measures (Beniczky et al.,2018; Beniczky et al., 2013).

Additionally, consumers expressed their satisfaction with the capability to monitor and interpret seizure data through smartphone applications or web-based platforms (Brinkmann et al., 2021; Bruno et al., 2020). This functionality enabled patients diagnosed with epilepsy to take an active role in their healthcare and engage in well-informed decisions with healthcare practitioners (Bruno et al., 2021; Bruno et al., 2018). The use of graphic depictions to illustrate seizure patterns and trends has improved knowledge and facilitation of effective management strategies for this disorder.

Nevertheless, certain problems were also discovered. The device's accuracy was undermined when users experienced intermittent false alarms caused by movements or activities unrelated to seizures, resulting in a decline in their confidence in the device (Ertugrul et al., 2022; Hadady et al., 2022). Moreover, there have been concerns raised about the issues of data privacy and security, given that wearable devices are capable of gathering sensitive health-related

data (Majumder et al., 2017). The need for user education and comprehensive training was emphasised as crucial elements in addressing these difficulties and facilitating the effective utilisation of the devices (Weatherburn et al., 2017).

The varying viewpoints of individuals on the comfort and security aspects associated with the use of seizure devices underscore the significance of taking into account their unique requirements and preferences (Moss et al., 2022). Manufacturers are aggressively integrating user input to enhance the comfort and security features of these devices (Nasseri et al., 2020; Nasseri et al., 2021). The objective is to improve the entire user experience and enable persons with epilepsy to effectively manage their disease by addressing concerns about physical comfort, emotional comfort, device dependability, and data security.

6. LIMITATIONS

The review did not include the finding from quantitative studies as the review focused on lived in experiences of the patient as this may missed some valuable finding from some studies which were in quantitative in nature. The process of retrieving and obtaining pertinent data from individual research proved to be a laborious and time-intensive task. In addition, some research studies exhibited a shortage of adequate data or presented data in a format that was not amenable to the extraction of pertinent information, hence impeding the process of obtaining useful insights. This constraint has the potential to impede an extensive review.

7. CONCLUSION

Wearable devices designed for seizure management have exhibited promising capabilities in enhancing the quality of life for those diagnosed with epilepsy. The overall user experience of these devices is typically characterised by favourable feedback, as users commonly report experiencing enhanced safety, sense of security, and satisfaction. Although seizure devices play a critical role in the monitoring and management of seizures, it is essential to take into account the perspective of patients about the potential discomfort they may encounter. Patients who use seizure devices must traverse several concerns, including physical discomfort, limited movement, emotional effects, maintenance and care demands. By understanding and effectively tackling these obstacles, healthcare practitioners may strive towards enhancing the whole encounter for patients, guaranteeing their ease and welfare during the use of seizure devices. However, more progress in technology and design is necessary to tackle the constraints that have been recognised. To enhance customer satisfaction and trust in these devices, it is imperative to solve the challenges associated with false alarms and data privacy. This systematic literature review is a helpful resource for researchers, developers, and healthcare practitioners who are interested in gaining a comprehensive understanding of and enhancing the user experience of seizure wearable devices.

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