



Barriers to adherence to standard precautions among community health workers: a scoping review

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Abstract

Aim This review aims to map available evidence on the adherence level and barriers to standard precautions among home-based community health workers.

Methods A scoping review using the JBI protocol searched multiple databases (Medline, CINAHL, PsycINFO and Web of Science) as well as Google Scholar for published articles on standard precaution practices of community health workers during home visits. Search terms included “standard precautions”, “guideline adherence”, “community health” and “home care”. Two-stage screening (title/abstract and full-text) was conducted to select relevant articles.

Results Eight eligible studies yielded three major themes: home environment context, individual factors and organisational factors. Findings indicated low adherence to standard precautions in home care, attributed to factors such as home layout, family or pet interference, cleanliness, limited access to protective equipment (e.g. gloves) and personal protective equipment allergies.

Conclusion Providing healthcare at home is challenging, impacting care quality. Further studies on standard precautions in home care can improve adherence, quality of care and patient outcomes.

Keywords Standard precautions · Guideline adherence · Community health workers · Home care · Community health

Background

In developed countries such as Australia, the UK, and the USA, there has been a growing emphasis on providing healthcare in the home setting. This shift is driven by several factors, including the increasing strain on the conventional hospital-based healthcare system and the adverse impact of hospitalisation on patients (Raymond 2016; Shang et al. 2018). The transition to home healthcare began in the US with a shift towards managing more chronic diseases within the community rather than in hospitals (Shang et al. 2018). Over the past two decades, there has been a significant expansion of home-based care. For example, in Australia, the utilisation of the Home Care Package (HCP) program has seen a remarkable increase. From September 30, 2021, to September 30, 2022, an additional 40,602 individuals accessed this program, while 18,879 individuals had yet to

accept their HCP offers (Department of Health and Aged Care [DHAC] 2023). Similarly, the Department of Health and Social Care [DHSC] (2021) predicts a 48% increase in the number of adults aged 65 and above with chronic diseases or disabilities in England who will require social or community care in 2038 compared to 2018.

Home healthcare offers several advantages, including reducing the burden on hospitals, alleviating the stress associated with hospital visits (Lichtenberg 2012; Shang et al. 2018) and meeting patient preferences (Australian Institute of Health and Welfare [AIHW] 2023). However, ensuring the same level of infection control in a home setting as in a hospital is challenging (Felemban et al. 2015; Raymond 2016). Although home care recipients are not exposed to the pathogens typically found in hospitals, the home environment is not entirely free of pathogens. In addition to healthcare workers and patients, the home environment may include family members, pets and other items that can harbor pathogens (Raymond 2016). The distinctive nature of the home environment underscores the critical importance of implementing robust infection control strategies when providing care at home (Shang et al. 2018).

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Inadequate infection control practices can lead to healthcare-associated infections (HAIs) (Felemban et al. 2015; Raymond 2016). HAIs are infections acquired during healthcare delivery, regardless of the care setting (WHO 2011). HAIs affect hundreds of millions of people worldwide with far-reaching consequences, including extended hospital stays, long-term disabilities, increased resistance of microbes to antibiotics, substantial financial burdens on healthcare systems, high costs for patients and their families, and unnecessary deaths (WHO 2011). In Europe, HAIs led to 16 million extra hospitalisation days, 37,000 deaths, and contribute to 110,000 additional deaths annually. The financial losses are estimated at around €7 billion annually, considering only direct costs. In the USA, HAIs were responsible for approximately 99,000 deaths in 2002 and had an economic impact of approximately US\$6.5 billion in 2004 (WHO 2011). Shang (2015) found that 17% of emergency hospitalisations among home healthcare recipients were due to home-acquired infections within an average of 17.1 days of receiving home healthcare services. In addition, the Centers for Disease Control and Prevention (CDC) (2021) reports that approximately 1 in 31 patients and 1 in 43 nursing home residents acquire infections related to their healthcare each day, highlighting the urgency for enhanced patient care practices across healthcare facilities.

An effective method of preventing HAIs is to comply with infection control guidelines such as standard precautions (SPs) (CDC 2018). SPs include measures such as hand hygiene, personal protective equipment (PPE), respiratory hygiene, sharps safety, and clean environments (CDC 2018). Healthcare workers must have adequate knowledge of SPs and apply them in all aspects of care delivery (Broussard and Kahwaji 2022). Despite efforts to train healthcare workers and promote adherence to SPs, suboptimal adherence remains a global issue (Cheung et al. 2015; Felemban et al. 2015; Oh and Choi 2019; Powers et al. 2016). Adherence tends to be lower among community healthcare workers, especially nurses, compared to their counterparts in acute settings (Abdulraheem and Amodu 2012; Akagbo et al. 2017; Maroldi et al. 2017). Factors such as occupational health risks, clients' socioeconomic status and home-specific factors like home structure and pet management may contribute to lower adherence in the community (Raymond 2016).

Given the complexities of providing healthcare in home settings and the evidence of low adherence to standard precautions during home visits, it is important to explore the barriers faced by community health workers. Therefore, this scoping review aims to map available evidence on the adherence level and barriers to SPs among home-based community health workers.

Methods

A scoping review was conducted to map the available evidence on SPs' practices of community health workers to identify barriers to adherence during home healthcare and identify knowledge gaps.

Search strategy

As recommended in the Joanna Briggs Institute (JBI) protocol for scoping reviews (Peters et al. 2020), a comprehensive search strategy was developed using a three-phase search process. Firstly, an initial limited search was conducted using a selected database (Medline) to find articles on the barriers that prevent adherence to standard precautions among community health workers. The keywords and index terms used in the selected articles were identified through titles and abstract screening, and these terms were used to develop a full search strategy. Secondly, the identified keywords were used to run a search through pre-selected databases (CINAHL, MEDLINE, PsycINFO and Web of Science). Third, reference screening of all selected articles was conducted to identify additional articles that met the inclusion criteria as determined by the reviewer.

The selected electronic databases were searched systematically. A Google Scholar search was also conducted to supplement the other databases. The full search was conducted between February and April 2022. Four major search terms were used including "standard precautions", "guideline adherence", "community health" and "home care" along with MeSH terms. The search strategy was developed using PICO reflecting the research population, phenomenon of interest, context and study design. The search limiters required the articles to be published from 1996 which is the date when the term *standard precaution* was adopted (Broussard and Kahwaji 2022). Also, only English language, full-text articles and peer-reviewed articles were included (see Appendix 1). Details of identified, included and excluded studies, and the reason for exclusion were recorded using a PRISMA flowchart (see Appendix 2). Articles meeting the inclusion criteria were reviewed in detail and the extracted information was tabulated (see Appendix 3).

Data synthesis

The data was analysed and synthesised using the reflexive thematic analysis approach described by Braun and Clarke (2021) who consider reflexive thematic analysis to be a reliable method of analysing qualitative data with emphasis on the importance of the researcher's subjectivity and active engagement at all stages of the research process. They describe a thoughtful and reflective engagement with

the data and the analytic process using a six-step approach, including becoming familiar with the data, generating initial codes, searching for themes from the generated codes, reviewing the generated themes, defining the themes and writing up a report.

Results

Eight studies were included in the review, of which three were conducted in the United States (Adams et al. 2021; McDonald et al. 2021; Russell et al. 2018), one in the United Kingdom (Bennett and Mansell 2004), one in Australia (Felemban et al. 2012), one in the Netherlands (Wendt et al. 2022), one in Belgium (Steffens et al. 2019) and one in Brazil (Cordeiro et al. 2021). In four of the studies, data were collected through direct observation (Cordeiro et al. 2021; Felemban et al. 2012; McDonald et al. 2021; Steffens et al. 2019), three studies were surveys (Adams et al. 2021; Bennett and Mansell 2004; Russell et al. 2018), one of which was an online survey (Adams et al. 2021). A multiple approach was used in the eighth study, including participant observation as the main method complemented with focus groups and semi-structured interviews (Wendt et al. 2022). Among the studies analysed, four had a notable sample size. Three surveys included the participation of 353 to 543 community health nurses (Adams et al. 2021; Bennett and Mansell 2004; Russell et al. 2018), while one observational study involved 50 nurses and recorded 2014 hand hygiene episodes (McDonald et al. 2021). The other studies were of moderate or small scale, with 940 hand hygiene opportunities recorded in one (Cordeiro et al. 2021), and various infection control practices observed on 21 occasions during complex nursing procedures in another (Steffens et al. 2019). In most of the included studies, the participants were nurses. However, two studies had a broader participant group. One study (Wendt et al. 2022) included nurses, professional caregivers, and clients who are independent with complex care. The other study (Cordeiro et al. 2021) included nurses, nursing assistants and technicians. It is worth noting that all studies used data collection tools validated by the WHO.

Three of the included studies examined nurses' compliance with hand hygiene guidelines during home care (Cordeiro et al. 2021; Felemban et al. 2012; McDonald et al. 2021), while three other studies explored the facilitating and inhibitory factors of adherence to SPs (Adams et al. 2021; Russell et al. 2018; Wendt et al. 2022). One study explored compliance with sharps disposal guidelines (Bennett and Mansell 2004), while another study assessed compliance with infection control practices during central line management in patients' homes (Steffens et al. 2019). Adherence to SPs was reported to be low among home healthcare providers (Adams et al. 2021; Bennett and Mansell 2004; Cordeiro

et al. 2021; Felemban et al. 2012; McDonald et al. 2021; Steffens et al. 2019; Wendt et al. 2022) except in the self-reported survey, where a high level of knowledge, positive attitude and compliance with SPs were reported (Russell et al. 2018). However, further enquiry into the specific infection control practices such as the knowledge and use of PPE highlights poor knowledge and low adherence level to SPs (Russell et al. 2018).

Three themes were generated from the reviewed studies which include the context of the home environment, individual factors and organisational factors.

Context of the home environment

Two major barriers to adherence were identified from the context of the home environment, which include the availability of equipment for maintaining standard precautions (Adams et al. 2021; Bennett and Mansell 2004; Felemban et al. 2012) and inhibitory factors in patients' homes (Adams et al. 2021; Felemban et al. 2012; McDonald et al. 2021; Wendt et al. 2022).

Availability of equipment for standard precautions

The availability of equipment is necessary to maintain standard precautions during home care. For example, suitable hand washing facilities for performing hand hygiene were found to be limited in clients' homes (Adams et al. 2021; Bennett and Mansell 2004; Cordeiro et al. 2021). One-quarter of the homes visited by community health workers did not have running water for handwashing (Adams et al. 2021) and only approximately one-sixth of the households had a handwashing sink (Cordeiro et al. 2021). One study found that liquid soap, alcohol-based hand sanitiser or paper towels were not available in any households (Cordeiro et al. 2021). It is important to note that the level of available equipment to enable SPs to be maintained varied from country to country. In the Australian study (Felemban et al. 2012), all homes had running water for handwashing while almost 90% of homes provided liquid soap. Hand drying facilities such as clean towels or paper towels were available half of the time. This is a significant difference in comparison with very limited or a complete lack of running water observed in the studies conducted in the United States and Brazil, respectively (Adams et al. 2021; Cordeiro et al. 2021).

Inhibitory factors in patients' homes

Some factors in the home were found to be inhibitory to SPs adherence, including dirty or cluttered home environments, the presence of pets during care provision and unsupervised children (Adams et al. 2021; Wendt et al. 2022). Most homes visited by community health workers to provide healthcare

were visibly dirty and contaminated except for a few tidy homes where the owners prepared a clean workspace for the healthcare providers. Some homes had “putrid waste, sticky floors, damaged interiors, inadequate lighting and lacked fresh air or adequate space for movement” (Wendt et al. 2022 p. 4). Interestingly, the community health workers had higher adherence to SPs in the unclean homes (Felemban et al. 2012; Wendt et al. 2022), presumably because they were exposed to higher infection risks in a visibly soiled environment, and they were more conscious of their personal safety (Felemban et al. 2012). This outcome is consistent with the findings of McDonald et al. (2021) that home health nurses had the highest rate of adherence to hand hygiene guidelines after having contact with body fluids.

Individual factors

Five of the included studies (Bennett and Mansell 2004; Cordeiro et al. 2021; Felemban et al. 2012; McDonald et al. 2021; Russell et al. 2018) explored the impact of individual factors on compliance with SPs. The results of these studies indicated that various factors, such as knowledge, attitude and risk perception, significantly influence an individual’s adherence to these precautions. Specifically, community health workers who possess a thorough understanding of SPs and are aware of the associated risks are more likely to comply with them. Conversely, community health workers who hold a negative attitude towards these precautions may be less inclined to follow them.

Knowledge of standard precautions

Community health workers demonstrated limited knowledge of SPs, which significantly affected their level of adherence (Bennett and Mansell 2004; Felemban et al. 2012). According to Felemban et al. (2012), only 25% of community nurses had a clear understanding of the WHO’s five moments for hand hygiene, which is considered the global standard. Even more concerning, only 12.5% of the nurses applied this concept during care delivery. This finding is consistent with that of Russell et al. (2018) who stated that in addition to poor knowledge of hand hygiene, community health nurses demonstrated a poor knowledge of the guidelines for wearing masks during care items that are likely to result in contact with body fluid from splashes. Poor knowledge of SPs was also evident in relation to the handling of bags for carrying healthcare supplies to patients’ homes. Many community health workers used the same bag for a long period of time, moving it from one home to another. This unhygienic practice increases the risk of transferring pathogens from one patient’s home to another, and from one community health worker to another (Russell et al. 2018). There was a disparity in knowledge among different units of community health

workers; lower knowledge of SPs was reported among community mental health nurses and learning disability nurses compared to general nurses (Bennett and Mansell 2004), possibly because the former was less exposed to appropriate training due to a perceived lower risk for infection in their area of expertise (Bennett and Mansell 2004).

Attitude and risk perception of community health workers

The attitude of community health workers towards standard precautions was found to be a key determinant of adherence, especially in hand hygiene practices. Most community health workers had hand sanitiser in their work bags but commonly forgot to take it into patients’ homes, while those who did take the hand sanitiser into patients’ homes forgot to use it (Cordeiro et al. 2021). This blasé approach may be related to a lack of confidence in the effectiveness of hand sanitisers. Felemban et al. (2012) found that three-quarters of community health workers preferred hand washing irrespective of visibly soiled hands compared to only a quarter who used hand sanitiser based on the standard practice for hand hygiene. However, adherence was found to increase when there was an awareness of an increased risk for infection. For example, 65.1% of community nurses performed hand hygiene after being exposed to body fluids, while only 29.5 % performed hand hygiene after touching a patient (McDonald et al. 2021).

The community health workers’ perceived risk also influenced adherence to SPs, including adverse reactions to alcohol-based hand rub, the development of dermatitis and the risk of needlestick injury (Bennett and Mansell 2004; Felemban et al. 2012). While gloves were available for use during home care, on many occasions community health workers chose not to wear them due to a reduction in dexterity, which could for example result in needle stick injury (Bennett and Mansell 2004; Felemban et al. 2012), especially while performing venepuncture (Bennett and Mansell 2004). Similarly, higher risk perceptions for skin irritation and allergic dermatitis were reported to influence community health workers’ decision to use alcohol-based hand sanitisers and latex-based gloves (Bennett and Mansell 2004; Felemban et al. 2012).

Organisational factors

Community health organisations play a vital role in promoting adherence to standard precautions during home care by ensuring the availability of PPE and mandating regular educational sessions specific to SPs’ practice in the home environment. Inadequate supply of PPE or limited access to ongoing training for community health workers result

in poor SPs adherence (Adam 2021; Bennett and Mansell 2004; Felemban et al. 2012).

Ongoing training

There is evidence pointing to limited access to ongoing training among community health workers. Bennett and Mansell's (2004) study emphasises the limited access to updated training, while Felemban et al. (2012) highlight the consequences of insufficient training on hand hygiene among community health workers. Bennett and Mansell (2004) studied the universal precautions' practices of 543 community health nurses, 69% of those who were general nurses, 55% were mental health nurses and 45% were learning disability nurses. The study found that only a small proportion of these nurses had access to updated training, with general nurses having the highest percentage (23%), followed by mental health nurses (14%) and learning disability nurses (7%). Additionally, Felemban et al. (2012) found that two-thirds of the community health workers observed in their study had not received updated training on hand hygiene for three years, resulting in their inadequate knowledge of hand hygiene concepts, including the step-by-step procedure for hand washing.

Personal Protective Equipment (PPE) supplies

Home healthcare agencies are responsible for ensuring an adequate supply of PPE as limited access of results in poor adherence to SPs and increases the risk of HAIs. Some studies have highlighted the insufficient provision of PPE for home healthcare by community health organisations (Adam 2021; Bennett and Mansell 2004; Felemban et al. 2012). Adam 2021 found that PPE was frequently unavailable, and only a limited range of PPE, such as alcohol-based hand sanitizers, gloves, face masks and face shields, were available about half of the time. Conversely, items such as alcohol swabs, alcohol solution and chlorhexidine wipes were rarely accessible. In addition, Bennett and Mansell (2004) argued that hand washing facilities in patients' homes are often less than adequate. However, it is worth noting that the availability of PPE varied across different countries. Felemban et al. (2012), whose research was conducted in Australia, reported that alcohol hand rubs and gloves were readily available during two-thirds of home visits.

Discussion

Adherence to SPs remains a challenge in home care with serious implications for the safety and quality of care. It is concerning that community health nurses claimed a high level of knowledge and adherence to SPs but demonstrated

otherwise. The problem is compounded by the limited evidence of SPs' practices in home care given that only eight studies were found to meet the inclusion criteria for this review. This highlights a need for further exploration of this topic. Homes are built for living with loved ones, either people or pets; however, when the home environment is temporarily used for healthcare, for the duration of care it becomes a critical part of healthcare delivery (Cole 2007). People, pets or non-living things such as furniture in the home could become a barrier to SPs' adherence which can significantly impact the quality of care. Interference from family members, pets and obstacles in the home were identified as barriers to adherence to standard precautions. This shows that adhering to standard precautions during home care is more complex than in other healthcare settings where the environment is purposely designed to delivery care. It stresses further the need for increased awareness of the uniqueness of the home environment when it is used for care provision, and the need for home care-specific practice standards to promote SPs' adherence and prevent HAIs (Shang et al. 2018).

Given the uniqueness of the home environment in respect to care delivery, community health workers have limited control over the workspace prepared for them in clients' homes. This may be related to cleanliness, interior layout or family members interference. The home environment is, therefore, a key determinant of community health workers' attitudes towards SPs. Community health workers perceived infection risks to be lower when providing care in a clean and tidy home, which reduces their adherence level, and vice versa. Such selective adherence can be attributed to inadequate knowledge, indicating the need for ongoing training and auditing of compliance to practice standards to promote a positive attitude towards SPs.

Home healthcare organisations play a significant role in promoting adherence to standard precautions through ongoing education and ensuring the availability of PPE. All healthcare organisations have the responsibility to train, equip and audit their employees to ensure compliance with practice standards. This calls for stricter auditing of home healthcare organisations to ensure that registration requirements are always met. Home health organisations can incorporate multiple practicable strategies to promote SPs' adherence. For example, as more recent evidence supports the claim that alcohol-based hand sanitisers cause dermatitis resulting in poor compliance (Pope and Ousley 2020), a non-alcohol-based alternative with a lower possibility of skin sensitivity can be arranged to increase compliance (Alhassan et al. 2021). Hansen et al. (2021) suggested that skin sensitivity to latex may be overcome by recent development in materials used in making gloves including a mixture of vinyl and nitrile as an alternative to rubber accelerators which causes sensitivity reactions on the skin. Healthcare providers who are sensitive to latex gloves may consider

this alternative because it provides the necessary protection against infection and is less likely to cause a skin reaction. This is a practicable alternative that promotes skin integrity without compromising professional commitment (Hansen et al. 2021). Non-latex gloves can be made accessible to home healthcare providers through a collaboration between glove manufacturers and community health organisations. Similar arrangements can be made to produce hand sanitisers that are less damaging to the skin, thereby increasing compliance with hand sanitiser use.

Furthermore, home healthcare organisations can incorporate more effective approaches into employees' training such as simulated scenarios with return demonstrations. While it may be more time-consuming than traditional online training, the approach has proven to significantly increase adherence to practice standards and competencies (Amorim et al. 2022). In Australia, annual hand hygiene education is mandatory for all healthcare workers. Despite this annual certification, evidence has pointed to poor compliance with hand hygiene guidelines. This calls for a review of the hand hygiene education requirement, the simulated scenarios coupled with return demonstration may be trialled to promote compliance with hand hygiene guidelines and these strategies, if effectively increased compliance can be incorporated into other elements of standard precautions.

Barriers to SPs in home care are not only related to clients and the community health team but also the social economic index of different countries; in this context, developing countries are found to be at a disadvantage (WHO 2020). Having basic amenities such as a tap and running water, liquid soap, and a clean towel or paper towel for hand hygiene was a problem in many countries. This implies that geographical variation in the availability of PPE may be a significant determinant of the infection rate of home care in each country. According to the Global Report on the Epidemiology and Burden of Sepsis, death occurring from sepsis is higher in countries with lower socioeconomic indexes compared to countries with higher socioeconomic indexes (WHO 2020). While each country is responsible for providing solutions to its health problems, promoting adherence to SPs is a global responsibility because poor SPs practices may result in global health problems. It is then important to make it a global public health priority to develop an intervention for sustainable higher adherence to SPs during home care (Johansen and Nohynek 2021). Such intervention may be fully funded or subsidised by the government of each country or the WHO depending on each country's socioeconomic index. This approach may seem unrealistic due to the expenses it may involve; however, the long-term effects of poor SPs' practices may result in a higher cost for the global community. Controlling infection requires global collaboration and interdependency among experts and governing authorities on all continents. The ongoing

COVID-19 pandemic has established the fact that no country is safe from infection irrespective of socioeconomic status and controlling infection is a collective battle (Johansen and Nohynek 2021).

Conclusion

This scoping review explored the practices of SPs among community health workers and identified inhibitory factors to adherence. The review showed persistent low level of adherence among community health workers and identified three major barriers to adherence, including the context of the home environment, individual factors and organisational factors. The review highlights that a sustainable increase in adherence to SPs in home care requires the collective efforts of the home care recipients, the community health workers, community health organisations and the government bodies worldwide. It is important to note that poor adherence to SPs is a global health problem, which calls for a global approach and collaboration for planning more effective strategies for increasing compliance with infection control guidelines and reducing healthcare associated infection.

Limitation

This scoping review has identified two limitations. Firstly, two of the studies included participants with a significant difference in educational levels, but this difference was not considered during the data analysis. The studies involved interviews with nurses, professional caregivers, nursing assistants, technicians and independent clients using a similar data collection tool. The variation in educational levels among participants could introduce bias into the studies' findings. However, despite this limitation, we included the studies in this review with the intention of mapping the available evidence to inform future research, rather than for direct application to practice. Secondly, a study published in 2004 was included, which may be considered outdated given the ongoing changes in infection control practices over time. Nevertheless, this study was deemed valuable for this review because its findings align with more recent evidence.

Implication for research, policy and practice

This study is significant as it mapped evidence on SPs' practices in home care. As only eight studies from five different countries were found to meet the inclusion criteria, there is a need for further research into the infection control practices in home care, both in Australia and globally to provide better insights into how best to promote adherence

to SPs in home care. A sustainable intervention will result in increased adherence, promote better patient outcomes, and increase the confidence of home healthcare recipients in care provided, resulting in reduced burden of healthcare on acute care facilities.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10389-024-02255-6>.

Authors' contributions All authors contributed to the study conception and design. Literature search and data analysis were performed by Margaret Adejumo and reviewed by Davina Porock and Melanie Baker. The first draft of the manuscript was written by Margaret Adejumo and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Data availability All data in this study are kept in the Edith Cowan Data Management System and are readily available.

Declarations

Ethics approval A waiver was granted for this study. Please see the details below under Appendix.

Consent to participate All authors consented to participate in the study.

Consent for publication No external materials are included in the publication.

Competing interests There is no known conflict of interest for this project.

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