

# Barriers and facilitators to infection prevention and control guidelines adherence: an integrative review

## Abstract

**Background/Aims** Midwives play a key role in the prevention and control of infection. The identification of barriers and facilitators to guideline adherence is of paramount importance to improve compliance and ultimately patient care. This review's aim was to explore barriers and facilitators to midwives' infection prevention and control guideline adherence.

**Methods** This integrated review used the Whittemore and Knaf method to conduct a systematic search of eight databases for research carried out between 2015 and 2021. Data were analysed using the Braun and Clarke framework and reported using PRISMA guidelines.

**Results** Four themes were identified: 'compliance is infrastructure and resource dependent', 'recognising and working with what you have', 'midwives' fear and anxiety' and 'culture change: a mammoth challenge'. Midwifery experience of infection prevention and control guidelines adherence is affected by factors such as resource availability, guideline availability, healthcare systems, socioeconomic factors and midwives' personal influences.

**Conclusions** Education for midwives is crucial to improve adherence to infection prevention and control guidance. However, education from a behaviour change standpoint has been shown to be most effective and this should be incorporated into training programmes.

## Keywords

Adherence | Barriers and facilitators | Guidelines | Infection prevention and control | Midwife

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Midwifery encompasses the care provided to women of childbearing age and newborn babies in the antenatal, intrapartum and postnatal period (Renfrew et al, 2014). Midwives are expected to deliver the highest standards of care (Nursing and Midwifery Board of Ireland, 2021). In pregnancy, birth and the postpartum period, there is the potential for infection and midwives need to be accomplished in preventing unnecessary morbidity and mortality through guideline adherence (Johnson and Taylor, 2016).

The prevention of harm to patients, healthcare personnel and the visiting public because of infection is a key component of healthcare (World Health Organization (WHO), 2020) and can be achieved through infection prevention and control measures, such as timely recognition, infection source control, the use of personal protective equipment, environmental and engineering regulations and administrative controls (WHO, 2014). Infection prevention and control guidelines provide clarity and direction based on the core components of infection prevention and control programmes that aim to avert and control healthcare infections (WHO, 2016).

Standard precautions form the basis of infection prevention and control guidance and may include hand hygiene, the use of personal protective equipment (gloves, masks, eyewear), respiratory hygiene/cough etiquette, sharps safety (engineering and work practice controls), safe injection practices (aseptic technique for parenteral medications) and sterile instruments and devices (Centers for Disease Control and Prevention, 2019). Applying standard precaution practices can prevent the transmission of infection by avoiding contact with all bodily fluids from excretions, except sweat, irrespective of whether there is blood, mucous membranes or broken skin incorporating rashes (Centers for Disease Control and Prevention, 2019).

Standard precautions are designed to be used regardless of whether the patient has an infection or perceived infection (Centers for Disease Control and Prevention, 2019) and include the management of waste and linen, decontamination of the environment and equipment,

personal protective equipment, hand hygiene and patient placement (Gammon and Hunt, 2018). However, the use of clinical guidelines by healthcare staff is suboptimal, although the guidelines provide evidence-based recommendations (Flodgren et al, 2016; Giglia and Reibel, 2019; Valiee and Salenejad, 2020; Alja'freh and Abu-Shaikha, 2021). Clinical guidelines apply scientific evidence for everyday practice in an efficient and consistent manner to support the provision of optimal care. However, guidelines are only beneficial if they are adhered to correctly by healthcare workers (Abrahamson et al, 2012).

Clinical guidelines have proven to reduce the occurrence of avoidable harm, consequently lessening the mortality rate, as well as being a means for the provision of standardised consistent care (Nabhan et al, 2012). Unfortunately, adherence to clinical guidelines is reported to be suboptimal worldwide in relation to infection prevention (Lam, 2014; Price and Williams, 2018). Bouchoucha and Moore (2018) also identified variation in healthcare workers' adherence to infection prevention and control guidelines was the result of personal judgements causing deviation from best practice.

Infections are the cause of an estimated 75 000 maternal deaths in underdeveloped countries annually, with a rate of 0.1 and 0.6 per 1000 births in developed countries (WHO, 2019). There is a clear need for infection prevention and control measures that are evidence-based in the prevention of maternal and newborn mortality (Buxton et al, 2019a). Understanding the barriers and facilitators midwives perceive to adherence to infection prevention and control guidelines can facilitate and instigate strategies to improve adherence through identification of adequate training, environmental appropriateness and organisational supports (Houghton et al, 2020). The aim of this integrative review was to evaluate international evidence on midwives' experiences of infection prevention and control guideline adherence.

## Methods

An integrative review was chosen for this study as it captures the dynamics and development of new knowledge of a phenomenon under study (Torraco, 2016). This is achieved through a review and critique of the available literature, synthesis of knowledge by a process of reconceptualisation of the phenomenon in mature topics and conceptualisation in new and emerging topics (Torraco, 2016). The integrative review distinguishes itself from other reviews by combining various methodologies, such as non-experimental and experimental research (Whittemore and Knafl, 2005). A five-stage integrated review framework was used in this review as it is designed to accommodate studies from diverse methodologies (Soares et al, 2014). The five stages

are identification of the problem, a literature search, data evaluation, data analysis and presenting findings.

### Stage 1: problem identification

Healthcare workers have a pivotal role in the prevention of infection through the application of measures such as standard precautions, and have a leadership role to play in the initiation of infection prevention and control measures (WHO, 2016). Infection transmission can be prevented by adhering to infection prevention and control guidelines (Chipfuwa et al, 2014). Unfortunately, midwives' compliance with infection prevention and control guidelines has been reported to be suboptimal (Simbar et al, 2011). The purpose of this review was to identify the barriers and facilitators midwives face in adhering to infection prevention and control guidelines. A population-exposure-outcome framework, as outlined by Bettany-Saltikov and McSherry (2016), was used to construct the research question, with the population being midwives, exposure being the barriers and facilitators and the outcome being adherence to infection prevention and control guidelines.

### Stage 2: literature search

Eight electronic databases, academic search complete, CINAHL, Cochrane, Embase, Medline, Midirs, SCOPUS and Web of Science, along with grey literature databases RAIN, LENUS, NICE and WHO, were searched for studies published between 1 January 2015 and 16 November 2021. The search was limited to 7 years to ensure current literature was retrieved. The search used Boolean operators (the search strategy is available from the authors on request), and the inclusion criteria selected for papers published in English with a translation available that included midwives and infection and prevention control guidelines.

### Stage 3: data evaluation and extraction

The literature search identified 5647 articles, which were exported to Endnote Web. Following duplicate removal of 1976 articles, 3671 papers remained. In accordance with the inclusion/exclusion criteria, the titles and abstracts were screened and 3633 papers were excluded as irrelevant. The remaining 38 papers were retrieved and given full consideration through reading of each paper in its entirety and deciding if it met the inclusion criteria. Of the 38 full text reviews, 16 were excluded and the 22 included papers were reread and the relevant data extracted.

All included papers were assessed for quality using the mixed methods appraisal tool (Hong et al, 2018), which was developed to evaluate qualitative, mixed-methods and quantitative studies. The mixed methods appraisal tool is scored on a scale of 1–7; two studies scored 4 out of 7 (Abdallahman et al, 2018; Scicluna and Attard

**Table 1. Coding and theme development**

Number	Codes	Subthemes	Theme
1	Healthcare physical environment Socioeconomic influences in policy implementation Healthcare systems Impact of COVID-19 Resource availability Economic status Midwives take ownership of guidelines Leadership	Physical environment Socioeconomic environment Organisational structures Taking ownership	Compliance is infrastructure- and resource-dependent
2	Resource availability does not equate to compliance Personal judgements and risk assessments Effective communication Effects of shift work/work patterns Institutional norms and accepted behaviour Professional impact	Resource availability and compliance Effective communication Maintaining personal and professional integrity	Recognising and working with what you have
3	Fear Midwives' confusion over policy implementation Anxiety Confusion in relation to roles Midwives wanting the best of their patients Midwives pride in their work Individual experiences Practice triggers such as posters	Psychological impact of the presence of guidelines Psychological impact of the absence of guidelines	Midwives' fear and anxiety
4	Behavioural change Effect of education. Level of education Level of experience Leadership	Encouraging behaviour change Education Experience	Culture change - a mammoth challenge

2021), three studies scored 6 out of 7 (Sahiledengle, 2018; Buxton et al, 2019b; Powell-Jackson et al, 2020) while the remainder scored 7 out of 7. The data extraction process enabled the specific methods and findings of each study to be identified to assist in assessing the paper's quality. Full details of the data extraction are available from the authors on request.

#### Stage 4: data analysis

The extracted data were analysed using thematic content analysis (Braun and Clarke, 2021), following the steps:

familiarisation, data coding, searching for themes, reviewing themes, defining and naming themes and finalising analysis (Table 1). The papers were read and reread to enable familiarisation of the data and four themes emerged, following an inductive process to discern groupings of similar information. The themes were 'compliance is infrastructure and resource dependent', 'recognising and working with what you have', 'midwives' fear and anxiety' and 'culture change: a mammoth challenge'.

The process of data analysis was iterative, involving reviewing the studies several times. The thematic analysis

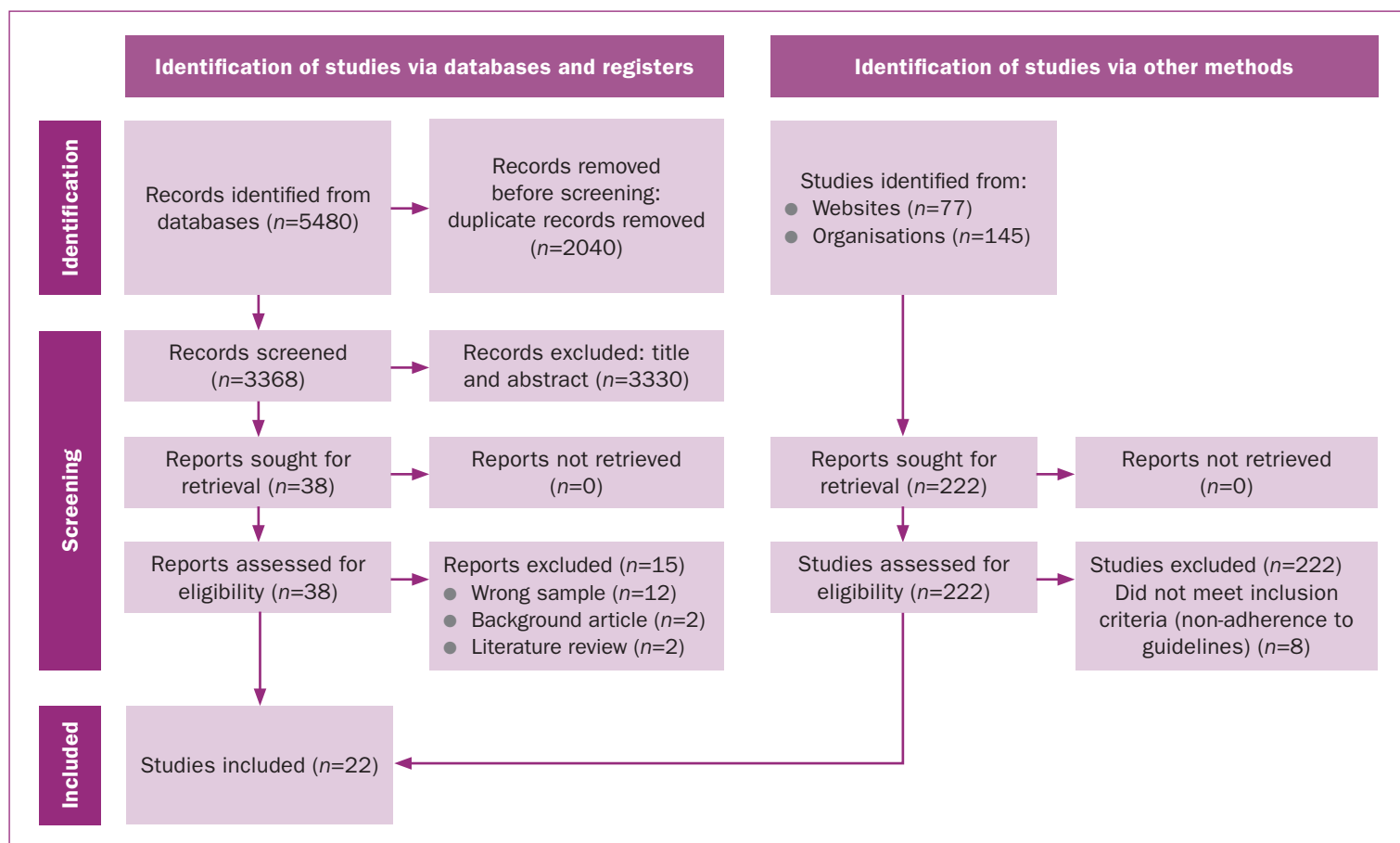


Figure 1. PRISMA 2020 flow diagram

enabled the authors to identify, analyse and report patterns and themes in the data that encapsulated something significant, and denoted a patterned response in the dataset, which linked to the central concept and was flexible (Braun and Clarke, 2021). The thematic analysis used an inductive approach across two levels, semantic and latent, where semantic refers to the surface meanings of the data, while latent examines underlying conceptualisations.

### Stage 5: presentation of results

The results of the search process are presented in the PRISMA (Page et al, 2021) flow diagram (Figure 1).

## Results

The characteristics of the studies are presented in Table 2, identifying the country of origin, type/design and focus of the included papers. Six of the studies focused on the impact of COVID-19 on midwives and midwifery care and are pertinent throughout the findings.

### Compliance is infrastructure and resource dependent

A total of 19 studies contributed to the theme 'compliance is infrastructure and resource dependent'. The theme

incorporated issues such as the physical and socioeconomic environment, as well as organisational structures.

The economic status of a country, including infrastructure and organisational structures, can affect the ability of health systems to provide adequate resources for effective infection prevention and control guideline implementation (Abdallah et al, 2018). The influence of the economic status of a country on its ability to provide adequate funding and resources for healthcare is critical for policymakers to understand, as Abdu et al (2018) identified in their study on the implementation of the 'surviving sepsis campaign'. The authors reported that this campaign would be ineffective in low-income countries, as they lack the required infrastructure and resources for implementation. Similarly, Alonso et al (2021) identified the effect of economic status in Mexico when implementing new guidelines and policies. Healthcare workers who worked in higher economic countries felt they were able to provide more respectful midwifery care during the COVID-19 pandemic than those in middle- and lower-income countries (Asefa et al, 2022). The availability of sufficient monetary resources influences healthcare in the ability to ensure adequate purchasing of materials, such as single use equipment,

**Table 2. Characteristics of included studies**

Characteristic	Details
Design	<ul style="list-style-type: none"> <li>• 11 cross-sectional studies (Sampat and Pursell, 2015; Abdu et al, 2018; Bouchoucha and Moore, 2018; Sahiledengle, 2018; Abuosi et al, 2020; Namwaya et al, 2020; Asefa et al, 2022; Ashinyo et al, 2021; Atnafie et al, 2021; Mitchell et al, 2021; Scicluna and Attard, 2021)</li> <li>• Three mixed methods (Buxton et al, 2019b; de Barra et al, 2021; Nalule et al, 2021),</li> <li>• Three quantitative descriptive studies (Rashaan and Abbas, 2017; Abutheraa et al, 2020; Kabasakal et al, 2021)</li> <li>• One quasi-experimental study (Abdallahman et al, 2018)</li> <li>• One phenomenological study (Alonso et al, 2021)</li> <li>• One exploratory study (Buxton et al, 2019b)</li> <li>• One observational study (Danda et al, 2015)</li> <li>• One secondary analysis study (Powell-Jackson et al, 2020)</li> </ul>
Country	<ul style="list-style-type: none"> <li>• Australia (<i>n</i>=3)</li> <li>• Ethiopia (<i>n</i>=2)</li> <li>• Iraq (<i>n</i>=1)</li> <li>• Nigeria (<i>n</i>=2)</li> <li>• Zimbabwe (<i>n</i>=1)</li> <li>• Zanzibar (<i>n</i>=1)</li> <li>• Turkey (<i>n</i>=1)</li> <li>• Cambodia (<i>n</i>=1)</li> <li>• Uganda (<i>n</i>=1)</li> <li>• Tanzania (<i>n</i>=1)</li> <li>• UK (<i>n</i>=1)</li> <li>• Malta (<i>n</i>=1)</li> <li>• Mexico (<i>n</i>=1)</li> <li>• Sudan (<i>n</i>=1)</li> <li>• Mawali (<i>n</i>=1)</li> <li>• Ghana (<i>n</i>=2)</li> <li>• Scotland (<i>n</i>=1)</li> </ul>
Focus	<ul style="list-style-type: none"> <li>• Six studies examined the impact of COVID-19 on midwives and midwifery care (Powell-Jackson et al, 2020; Alonso et al, 2021; Ashinyo et al, 2021; Atnafie et al, 2021; Kabasakal et al, 2021; Asefa et al, 2022)</li> <li>• Three studies examined hygiene practices, cleaning and disinfection (Sahiledengle, 2018; Buxton et al, 2019b; Mitchell et al, 2021)</li> <li>• Two studies focused on hand hygiene practices among midwives (Abuosi et al, 2020; Nalule et al, 2021)</li> <li>• Three studies focused on the practices of midwives in the delivery of care (Danda et al, 2015; Rashann and Abbas, 2017; Namwaya et al, 2020)</li> <li>• One study assessed the effect of education on compliance (Abdallahman et al, 2018)</li> <li>• Six studies identified the barriers and opportunities for guideline use by midwives (Sampat and Pursell, 2015; Abdu et al, 2018; Bouchoucha and Moore, 2018; Buxton et al, 2019a; Abutheraa et al, 2020; Scicluna and Attard, 2021)</li> </ul>

to prevent outdated processing of medical equipment, cleaning equipment and resources (Buxton et al, 2019a).

Health systems came under immense pressure with the onset of the pandemic, and the pandemic has adversely affected the provision of safe and effective midwifery care as a result of increased demand on services (Ashinyo et al, 2021). Midwives need to take ownership of guidelines, as demonstrated by Alonso et al (2021), who examined guideline requirements and the implementation of infection prevention and control guidelines. Likewise, Nalule et al (2021) identified that midwives felt a sense of ownership in relation to practice and resources in the delivery room. They ensured adequate supplies of equipment and hand hygiene materials were available and infection prevention and control guidelines were adhered to, while junior midwives depended on senior midwives for guidance.

### Recognising and working with what you have

The theme 'recognising and working with what you have' was identified in 19 studies. It encompassed taking ownership, resource availability and compliance, effective communication and maintaining personal and professional integrity.

The availability and quality of resources affects midwives' ability to adhere to infection prevention

and control guidelines (Kabasakal et al, 2021). While Kabasakal et al (2021) recognised that some of these factors are beyond the control of the midwife, such as the quality of personal protective equipment, Nalule et al (2021) identified that it is the midwife who has control over activities such as equipment disinfection and hand hygiene. Bouchoucha and Moore (2018) agreed that midwives use their own judgment and personal risk assessment when adhering to infection prevention and control guidelines, but also look to more experienced healthcare workers for guidance.

Despite the availability of hand hygiene resources, Scicluna and Attard (2021) noted that because of personal skin sensitivities and resource factors, such as time constraints, midwives often did not comply with hand hygiene. Shift work, staffing levels and shift patterns also affected compliance with guidelines (Buxton et al, 2019b; Nalule et al, 2021). Additionally, the physical implications of following correct procedures can influence guideline adherence. These implications included the possibility of developing a skin condition from wearing gloves, wearing personal protective equipment causing a communication barrier between a midwife and the women in their care and the physical burden of wearing personal protective equipment (Alonso et al, 2021; Scicluna and Attard, 2021; Asefa et al, 2022).



Abutheraa et al (2020) evaluated the implementation of the sepsis six care bundle and found that if the sepsis sticker was not available then it was not used, which affected adherence to best practice. Abdu et al (2018) also reported that resource limitations cause a barrier to infection prevention and control guideline adherence. Asefa et al (2022) and Alonso et al (2021) highlighted the effect of resource availability on the provision of respectful maternity care and the role resources must play in the implementation of new policies and guidelines.

However, Nalule et al (2021) found that midwives complied to adequate hand hygiene, but then proceeded to contaminate their hands while donning personal protective equipment, highlighting the need for education as well as a re-evaluation of its effect.

### Midwives' fear and anxiety

The theme 'midwives' fear and anxiety' was evident in 11 studies. Midwives lacked clarity regarding role identification in relation to cleaning and cleaning product use (Mitchell et al, 2021). The rapid and ever-changing guidance developed for COVID-19 was also a source of confusion for midwives, as multiple changes in guidance had to be adapted rapidly (Asefa et al, 2022). Sampat and Purssell (2015) reported confusion in guidelines implementation and that midwives found it difficult to identify what guidelines should be followed. The way that new guidance was implemented could also lead to confusion. Abutheraa et al (2020) identified that implementation of a sepsis care bundle was challenging as a result of staff training and acceptance of the new initiative.

Fear and anxiety were experienced by midwives, which affected guideline adherence. Alonso et al (2021) identified fear of contracting COVID-19 as a key indicator for implementation of and adherence to clinical guidelines in response to the pandemic. Sources of fear and anxiety because of COVID-19 included bringing illness home and infecting loved ones, being infected themselves and fear of the unknown in the COVID-19 pandemic, and this fear impacted patient care (Buxton et al, 2019b; Kabasakal et al, 2021; Asefa et al, 2022).

Midwives' pride and the need to do their best for their patients also influenced guideline adherence (Asefa et al, 2022). However, recent research found that midwives made decisions based on personal experience outside of the guidelines, deviating from best practice and possibly not being in the patient's best interest (Buxton et al, 2019b, 2019c; Atnafie et al, 2021; Nalule et al, 2021).

### Culture change: a mammoth challenge

The theme 'culture change: a mammoth challenge' was identified in 16 studies. Atnafie et al (2021) identified that healthcare workers, including midwives, who had good

hand hygiene were 56 times less likely to be infected with COVID-19 than those with poor hand hygiene practices. Similarly, Mitchell et al (2021) identified that staff behaviours were a source of the spread of infection in hospital settings if clinical guidelines were not adhered to correctly.

Buxton et al (2019b) acknowledged that behaviour was influenced by routines, for example, not doing hand hygiene between glove changes. Behaviours based on personal judgments or observation of other healthcare professionals and culture can affect adherence to standard precautions, demonstrating the need for effective leadership and management to ensure guidelines are being followed (Bouchoucha and Moore, 2018). Some of these behaviours can be modified by using posters to trigger staff to ensure correct procedures are carried out (Bouchoucha et al, 2018; de Barra et al, 2021; Mitchell et al, 2021).

The type and effect of education were identified as vital to promote adherence to guidelines. Abdalrahman et al (2018) investigated the effect of hand hygiene education in Sudan and found no change in hand hygiene behaviours after education had been provided, highlighting the need for interventions containing behavioural change elements. Abuosi et al (2020) identified that healthcare workers' adherence to the five moments of hand hygiene was poor, although recent training had been provided, illustrating the need for feedback and continuous monitoring to change healthcare professionals' behaviours.

Buxton et al (2019b) highlighted that despite training, hand hygiene remained inadequate. Abutheraa et al (2020) also found that despite training on the implementation of a sepsis care bundle, staff were still unsure how to implement it. Buxton et al (2019c) and Nalule et al (2021) identified that following training, midwives were expected to pass on their knowledge to other midwives who did not attend the organised training and most education was limited to midwifery training. However, staff felt they did not receive sufficient training in relation to cleaning products and cleaning protocols (Mitchell et al, 2021) and called for further education on the safe use of personal protective equipment (Rashaan and Abbas, 2017).

### Discussion

This integrated review highlighted the complex factors and experiences affecting midwives and their ability to adhere to infection prevention and control guidelines. The physical environment, including the availability of hand hygiene sinks and water as well as ward layout, hugely affects midwives' ability to adhere to guidelines, and is influenced by the country's economic status (Abdalrahman et al, 2018). The availability of basic

infrastructure highlights inequalities in healthcare systems globally and the effect this inequality has on the provision of safe and effective midwifery care in relation to the implementation of infection prevention and control guidelines.

The availability of universal health coverage for accessible high-quality healthcare is vital (World Bank et al, 2017). The introduction of universal health coverage has been deterred by the lack of basic infrastructure, such as hand hygiene sinks, and the WHO and UNICEF (2019) have called for adequate availability of water and sanitation in healthcare facilities. Water and sanitation facility improvement tools have been introduced, which use a risk-based approach in healthcare facilities in low- and middle-income countries to improve hygiene, water quality and healthcare waste management (WHO and UNICEF, 2019). Mannava et al (2019) identified that across seven countries in the Pacific and East Asia, where national water and sanitation policies are in place, there is a higher availability of hospitals with water and hygiene services and called for further application of water and sanitation services to improve maternity and newborn care.

The COVID-19 pandemic has had a substantial impact on midwives and the provision of respectful midwifery care and services, putting health services and staff under extreme pressure (Alnuaimi, 2021). In Australia, the addition of measures such as social distancing affected midwives' ability to provide quality midwifery care, because of the need for touch in developing therapeutic relationships in midwifery (Hobbs et al, 2022). Based on this review, midwives found this extremely challenging.

While the availability and quality of personal protective equipment impacted health professionals' ability to adhere to infection prevention and control guidelines internationally (Gondi et al, 2020), the physical environment and location of the service also prevented midwives from adhering to guidelines. Nonetheless, it has also been found that when personal protective equipment was available, there was varied compliance, particularly during the COVID-19 pandemic (Darwish et al, 2021). Darwish et al (2021) identified that most healthcare workers were compliant with using personal protective equipment correctly when caring for a patient when COVID-19 was not suspected. However, only around half as many were compliant during aerosol generating procedures, despite guidance provided by the Centers for Disease Control and Prevention (2019). Furthermore, a study from the Democratic Republic of Congo found that almost half of the respondents did not use personal protective equipment consistently (Michel-Kabamba et al, 2020), highlighting the need for behaviour change through education.

A recurring theme from the literature review was the impact of guideline availability. Danda et al (2015)

identified the differences in care provision when guidelines and policies were present versus when they were absent in two healthcare facilities in Zimbabwe. Similarly, Geberemariyam et al (2018) identified that the availability of guidelines improved healthcare staff compliance with infection prevention and control measures by more than three times in healthcare in southeast Ethiopia.

The need for leadership was identified and deemed fundamental in the implementation and compliance of infection prevention and control measures (Health Foundation, 2015). O'Neill (2016) recommends strong organisational leadership to effectively implement infection prevention and control measures. Differing from hierarchical management, it is important to note that effective leadership that is transformational motivates staff to act in a way that sustains the greater good, rather than their own interests (Doody and Doody, 2012; Gould et al, 2016).

The present review highlighted the need for midwives to take ownership of the guidelines. The benefits of taking ownership were demonstrated by Alonso et al (2021), who examined guideline requirements and the implementation of infection prevention and control guidelines in Mexico. In infection prevention and control, despite advances to improve compliance, there were many remaining challenges, including organisational structures. Encouraging midwives to take ownership of infection prevention and control is not a new phenomenon (Zimmerman et al, 2013). The identification and need for change champions were evident, and highlight the importance of senior staff in setting standards and leading by example. Many infection prevention and control innovations have called for role models and champions (Kanu et al, 2019). Schneider et al (2009) demonstrated that junior health professionals' hand hygiene adherence improved when a good standard was set by more senior health professionals.

Lailawidar et al (2022) highlighted that education, years of experience, knowledge and attitude had a significant influence in the application of infection prevention and control measures in Indonesia. The literature highlighted that midwives often did not comply with hand hygiene, because of factors such as skin sensitivities or time constraints (Kısacık and Özyürek, 2021). The majority of healthcare workers experienced a reaction to wearing personal protective equipment, with 74% experiencing hand dryness and 72.1% experiencing itch in relation to glove use. In Turkey, a study by Ertuğ and Onder (2021) identified 88.1% of healthcare workers experience adverse effects from personal protective equipment, which affected compliance.

Shift work, staffing levels and shift patterns were also found to affect compliance with infection

prevention and control measures, including hand hygiene compliance. In a study of healthcare workers in a neonatal unit, Rittenschober-Böhm et al (2020) found that infection prevention and control compliance differed at the beginning of a 12.5 hour day shift to the end. Similarly, in a longitudinal study of 4157 healthcare professionals across 35 hospitals, Dai et al (2020) found that compliance with hand hygiene dropped from the beginning of a shift to the end of a 12 hour shift by 8.7%. This highlighted the effect of shift work on compliance with infection prevention and control measures in relation to hand hygiene.

The present review highlighted that midwives are motivated by anxiety and fear of spreading infection and bringing it home to their families, which prompted adherence to infection prevention and control guidelines. Couper et al (2022) identified that bringing home infection to family was a source of demonstrable psychological impact on midwives in the UK. High anxiety levels were reported in 27.7% of participants and moderate anxiety in 51% in a study of healthcare workers (Alrubaiee et al, 2020). This fear and anxiety could be attributed to their knowledge of COVID-19, resulting in the influence of anxiety-preventative behaviours and highlighting the need to adhere to infection prevention and control guidance.

A recurring theme in the present review was the impact of education, incorporating the type and the effect education had on infection prevention and control guideline adherence. Supporting this theme, Roy et al (2020) identified the need for adequate infection prevention and control awareness to create optimistic attitudes in relation to preventing the spread of the coronavirus during the COVID-19 pandemic. This is attainable through education and training, as Scicluna and Attard (2021) identified that 98% of midwives in their study saw the necessity for regular training in relation to infection prevention and control. The WHO (2009) introduced a multimodal approach to promote hand hygiene, with varied success. Yousef et al (2020) identified increased compliance with hand hygiene before the introduction of a modified WHO multimodal approach and saw a 58% increase in hand hygiene following implementation. Hand hygiene compliance rose from 18% to 41% in a study by Arntz et al (2016) after the implementation of the multimodal approach. Valim et al (2019) recommends that all elements of the approach be used to ensure effectiveness. Shah et al (2015) identified that interventions, such as approaches that generate feedback, involving champions, reminders and financial incentives, have been ineffective and there needs to be a focus on behaviour changes that may affect compliance.

The availability of multiple infection prevention and control guidelines that may contain conflicting

## Key points

- Infection prevention and control is an evidence-based approach to the prevention of the acquisitions of avoidable infections for both service users and healthcare staff.
- The transmission of infections acquired in the hospital setting can be avoided by following evidence-based infection prevention and control guidelines.
- Infection prevention and control guidelines provide best practice guidance.
- Midwives' adherence to guidelines is influenced by the ecological and socioeconomic environment, organisational structures, resource availability, experience and personal judgements.
- Education and training have been shown to improve adherence.

information can often lead to confusion for healthcare workers (Birgand et al, 2015). Similarly, lengthy guidelines that are not user friendly can lead to suboptimal adherence (Mwangome et al, 2017). Therefore, communication of the guidelines is of paramount importance to ensure adherence (Shayo et al, 2014).

## Limitations

To the authors' knowledge, this is the first integrative review conducted to identify the barriers and facilitators to midwives' adherence with infection prevention and control guideline adherence. A limitation of this review is that the studies were not specifically designed to examine facilitators and barriers to midwives' adherence with infection prevention and control guidelines.

## Conclusions

Several factors influence midwives' adherence to infection prevention and control guidelines, including the physical and socioeconomic environment, organisational structures, resource availability, experience and personal judgements and compliance. Midwives strive to maintain personal and professional integrity; however, the psychological impact of guideline presence or absence can affect a midwife's ability to adhere to best practice. Education and training from a behavioural aspect has been shown to improve adherence, and education programmes need to be tailored to facilitate this approach. **BJM**

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## CPD reflective questions

- How will you ensure that you incorporate infection prevention and control measures into your daily practice?
- Do you perform a risk assessment prior to providing client care?
- How can you support a healthy infection prevention and control workplace culture in your practice setting?
- How do you communicate with women/clients about the importance of infection prevention and control practices?

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