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State of the Science Review

Hospital patient experiences of contact isolation for antimicrobial resistant organisms in relation to health care–associated infections: A systematic review and narrative synthesis of the evidence

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Background: The alarming growth of antimicrobial resistance organisms (AMRs) and the threat caused by health care–associated infections require hospitalized individuals who are infected or colonized with AMRs to be cared for in isolation, predominantly in single rooms. None of the existing reviews focus on or specifically address the patient's experience of being cared for in contact isolation when affected by AMRs exploring this specific context.

Methods: Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidance for the conduct of systematic reviews was applied. Five databases were searched from inception to April 2019, with keywords related to adult patient experiences, AMR, and contact isolation. The evidence was certified by 2 reviewers. Principles of thematic analysis were used to produce a narrative synthesis of the findings.

Results: Eighteen eligible studies were identified. Narrative synthesis resulted in 3 overarching categories reflecting the patient experience: privacy versus loneliness; emotional responses to isolation; quality of care, recovery, and safety in isolation.

Conclusions: This review synthesizes existing evidence reflecting the patient experience of contact isolation. Study findings were often contradictory and may not reflect contemporary health care, such as shorter hospital stays, or societal preferences for greater privacy. Further research focusing on contemporary health care contexts is recommended.

BACKGROUND

Infection prevention control (IPC) is recognized as being essential to limiting the spread of microorganisms in clinical settings and beyond.[1,2] However, concerns over the increasing number of health care–associated infections (HAIs)[3] and the alarming growth of antimicrobial resistance (AMR)[4] have made IPC implementation even more crucial. Preventing HAIs and subsequent severe illnesses with associated high hospital costs[5] represents one of the key objectives of the World Health Organization in the fight against AMR.[6] These concerns are intensified by harmful outcomes[7-11] and projections of an accelerating upsurge of AMR posed by the global COVID-19 pandemic.[12-15]

In hospital settings, the prevention of HAIs transmission and AMR containment is achieved by applying a series of standardized IPC precautions, characterized by preliminary clinical assessment and an active safeguarding surveillance system of precautions and

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isolation measures.[16,17] These isolation measures are determined by the type of infection or colonization by AMR organisms, the responsible microorganism, and its route of transmission.[18] The mode of transmission is therefore pivotal in determining the nature of isolation precautions. Accordingly, diverse transmission–based precautions (TBPs) known as contact, droplet, and airborne precautions are implemented.[19] Unfortunately, the transmission of these microorganisms and the resulting acquired infection or colonization can occur by simple contact with contaminated objects or surfaces; therefore, IPC faces perpetual challenges to ensure patient safety in health care settings.[20]

Hospitalized patients who are infected and/or colonized by AMR organisms require contact isolation measures where environmental and spatial restrictions are applied.[21] Where available, single rooms are the ideal and most appropriate accommodation to avoid the spread of microorganisms to other patients, staff, and visitors.[18,21-23] While this appears to have advantages in reducing the burden of HAIs[23,24] and containing the growth of AMR by limiting the patient's movements and interactions, it has been suggested that isolation practice negatively impacts on patient physical and psychological well-being.[25-32]

Previous literature reviews[33-36] have considered the effects that isolation may have on adults affected by different microorganisms, including those cared for in protective isolation,[37] whereas other reviewers have examined how the daily lives of individuals are affected when they are colonized by multidrug-resistant organisms outside of the hospital setting.[38] More recent reviews[39-41] have evaluated the impacts of isolation precautions on any hospitalized patient. Nair et al[39] aimed to review potential correlations between isolation precautions and patient experience by assessing solely quantifiable data. Purssell et al[40] looked at the psychological and non-psychological outcomes of hospitalized infected patients, whereas Saliba et al[41] reviewed adverse events associated with patient isolation. All 3 included studies focused on the consequences of being cared for in isolation under different TBPs. They measured the responses to IPC isolation measures rather than reviewing patients' lived experiences and the process of being cared for in isolation. This, therefore, did not allow for an assessment and/or deep exploration of the adult patients' perceptions of their experience while being cared for in contact isolation for IPC in acute settings when infected or colonized by AMR organisms. Interestingly, a 2019 scoping review[42] searched and assessed the evidence of stigma linked to source isolation without differentiating the typology of TBPs. None of the existing reviews have focused on or specifically addressed the patient's experience of being cared for in contact isolation when affected by resistant organisms. We believe that focusing on those patients placed under contact precaution, which is recognized as the most "challenging" and controversial TBP to implement[43,44] would explore this particular AMR context.

To address this gap, we aimed to answer the following question, "what is the patient experience of being cared for in isolation for IPC when infected or colonized by AMR organisms?" by identifying, appraising, and synthesizing the available peer-reviewed evidence.

METHODS

We adopted the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines to increase transparency in the synthesis of the retrieved evidence.[45] We combined quantitative, qualitative, and mixed-method evidence while adopting an iterative analytical framework of a narrative synthesis providing a transparent and systematic management and summary of the findings to minimize bias.[46,47]

Search strategy

An adapted Population, Interest, Context, Outcomes, Study design (PICOs) framework,[48] as noted in Table 1, guided and defined the search.

A systematic search was conducted across 5 electronic databases: CINAHL EBSCO, Ovid MEDLINE, PsycINFO, Web of Science, and Embase Ovid using headings and control vocabulary and keywords related to each element of PICOs that were adapted to each specific database. The search terms were combined with the Boolean operators "AND" and "OR" and the use of search syntax allowed the researchers to restrict or broaden the search results.[49] A generic CINAHL search strategy is available from the authors as Supplementary file 1. Due to a lack of translation resources, only studies published in English from inception to 2019 were included. The last search date was April 16, 2019. Email alerts were set for updates. Duplicate records were identified using RefWorks-ProQuest[50] and then manually removed. Reference lists of relevant studies eligible for inclusion were manually checked by 2 reviewers.

Study selection

The identified studies' titles and abstracts were broadly screened by the first reviewer (LF) against the inclusion and exclusion criteria (Table 2). The full texts of the eligible records were then assessed for inclusion by both the first (LF) and second reviewer (AD) independently. A thorough screening of the selected studies was carried out, and conflicting opinions were discussed and resolved with a third reviewer's (CK) opinion before finalizing the number of studies to be included.

Quality appraisal and risk of bias assessment were carried out by the first reviewer (LF) supported by the Caldwell et al,[51] tools which allowed the validation of the evidence retrieved from the quantitative, qualitative, and mixed-method studies. A second reviewer (AD) independently sampled the quality of a few of the randomly selected studies. This process highlighted small discrepancies, which were easily resolved through methodical discussion amongst the reviewers. As a result, a scoring system was applied to each of the 18 questions staged by the framework. A score of 0 was considered low, 1 medium, and 2 high. If a study scored 18, it would be excluded based on the low quality; all retrieved articles had a score of above 18 and none were excluded on the basis of low quality (Supplementary file 2).

Table 1
Adapted PICOs framework

PICOs core elements	Identified criteria
Population	Adult patients (aged over 18) infected or colonized with specific AMR organisms requiring contact precautions for IPC
Interest	Patients' experience of isolation for IPC due to infection or colonization with specific AMR organisms
Context	Hospital settings
Outcomes	Any psychosocial outcome reported as a consequence of the patient experience of isolation, including attitudes, physical, emotional, psychological, or relational consequences
Study design	Qualitative, quantitative, and mixed methods original research papers, published in peer-reviewed and scientific journals

AMR, antimicrobial resistance; *IPC*, infection prevention control.

Table 2
Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Studies (quantitative, qualitative, and mixed methods) conducted on hospitalized adult patients (aged over 18) infected or colonized with specific AMR organisms requiring contact precautions for IPC	Studies where the population target was children
Studies that reported patients' experiences of isolation for IPC under contact precautions in hospital settings	Studies where the microorganism was not related to hospital-associated infections or related to protective/reverse isolation, conducted in long-term facilities, outside health care settings or in patients' home settings and did not report the patient experience of isolation for IPC under contact precautions
Studies written in English	Studies not written in English, systematic reviews, meta-analysis, poster and conference abstracts, commentaries, and/or letters to editors

AMR, antimicrobial resistance; *IPC*, infection prevention control.

Data extraction

A standardized form was designed to systematically record the information from the studies, summarize findings, and arrange data chronologically and by research methods and designs (Supplementary file 3). This was initially carried out by 1 reviewer (LF) and then tested and validated by a second (AD).

Data synthesis

Guidelines from the Popay et al[46] framework and principles of Braun and Clarke's[52] thematic analysis were used to synthesize data.

A synthesis was obtained by organizing and cross-examining the data from all of the 9 quantitative,[54-62] 6 qualitative[63–68], and 3 mixed methods[69-71] included studies. We considered the heterogeneity of the methodologies and the reported outcomes, and we appreciated their differences while assessing the context of patients' experiences of isolation to answer the review question.

Key findings reported in each study were entered into NVivo 12[53] and initial coding labels were assigned to each extract. Similar findings from different studies were combined under a higher level of label or theme. This process looked at any physical, psychological, emotional, and social outcomes related to the experience of being cared for in isolation as core elements of the search strategy.

It was defined by a thorough engagement with all the studies' results and findings which led to the identification of patterns across the data set and differences in the experiences of patients. Recurrent words, ideas, and concepts were arranged developing preliminary themes. These were originally descriptive and aggregative. Further interpretation of the themes (Supplementary file 4) resulted in the identification of conceptual categories (see Table 3). The development of these categories was labor intensive. A discussion amongst the team and a reassessment of the whole data in relation to the review questions led to further comprehensive analysis.

Table 3
Categories and themes conceptualization

Categories	Themes
Privacy versus loneliness	• Feelings about being cared for in isolation • Feelings towards the isolation room • Happiness versus unhappiness • Comfort versus confinement • Environmental space • Communication and relationships: a breaking point
Emotional responses to isolation	• Experiencing anxiety and depression • Unsettled emotional responses • Stigma, frustration, and anger: feelings of shame • A matter of time
Quality of care, recovery, and safety in isolation	• Perception of care • Impact on patients' safety and recovery • Inconsistency of practices by HCPs • Blaming the system • Understanding and knowledge of isolation measures, infection, and colonization

HCPs, health care professionals.

RESULTS

The search and study selection approach is presented through the Preferred Reporting Items for Systematic Reviews and Meta-Analyses diagram[45] in Figure 1.

Characteristics of the included studies

Eighteen records met the inclusion criteria. Publication years ranged from 1993 to 2014; studies were predominately from the United States,[7] the United Kingdom,[5] Europe,[3] Canada,[1] New Zealand,[1] and Singapore.[1]

Methodologically, they were as follows: 9 quantitative, 6 qualitative, and 3 mixed methods. Quantitative studies were considered quasi-experimental designs (nonrandomized) with prospective and retrospective characteristics aiming to assess the incidence and prevalence of contact isolation effects on patients' care and their psychological well-being.[54-62] One was a matched cohort study[56] with prospective observation and a follow-up questionnaire to patients in contact isolation about the care received.

The qualitative records[63-68] were exploratory descriptive studies of patients' experiences of contact isolation. Four[64-66,68] focused on MRSA patients, one[67] on patients affected by *Clostridium difficile* and their family members' experiences, and one[63] did not specify the infectious agent, but patients were isolated for HAI or community-acquired infection.

The included mixed-method studies[69-71] explored patients' experiences of isolation from different perspectives. Data was obtained by employing questionnaires and semistructured interviews,[69] validated interviews and postdischarge satisfaction surveys,[70] and an MRSA screening program evaluation combined with a survey on the patients' experiences of being cared for in isolation.[71]

Methodological quality varied among the studies with some apparent weaknesses in ethical consent[61,64]; sampling issues.[54,61,64] Quasi-experimental designs measured[54-62] provided quick valuable data although this was limited to an external descriptive measurement view of the effect of contact isolation on patients' care and their psychological well-being rather than an explanation of it or limited insight. Conversely, qualitative studies[63–68] demonstrated a phenomenological explorative approach to the experience of being cared for in isolation. However, differences in the analytical process were shared. Their theoretical and philosophical assumptions were partially presented. Researchers' reflexivity was absent therefore

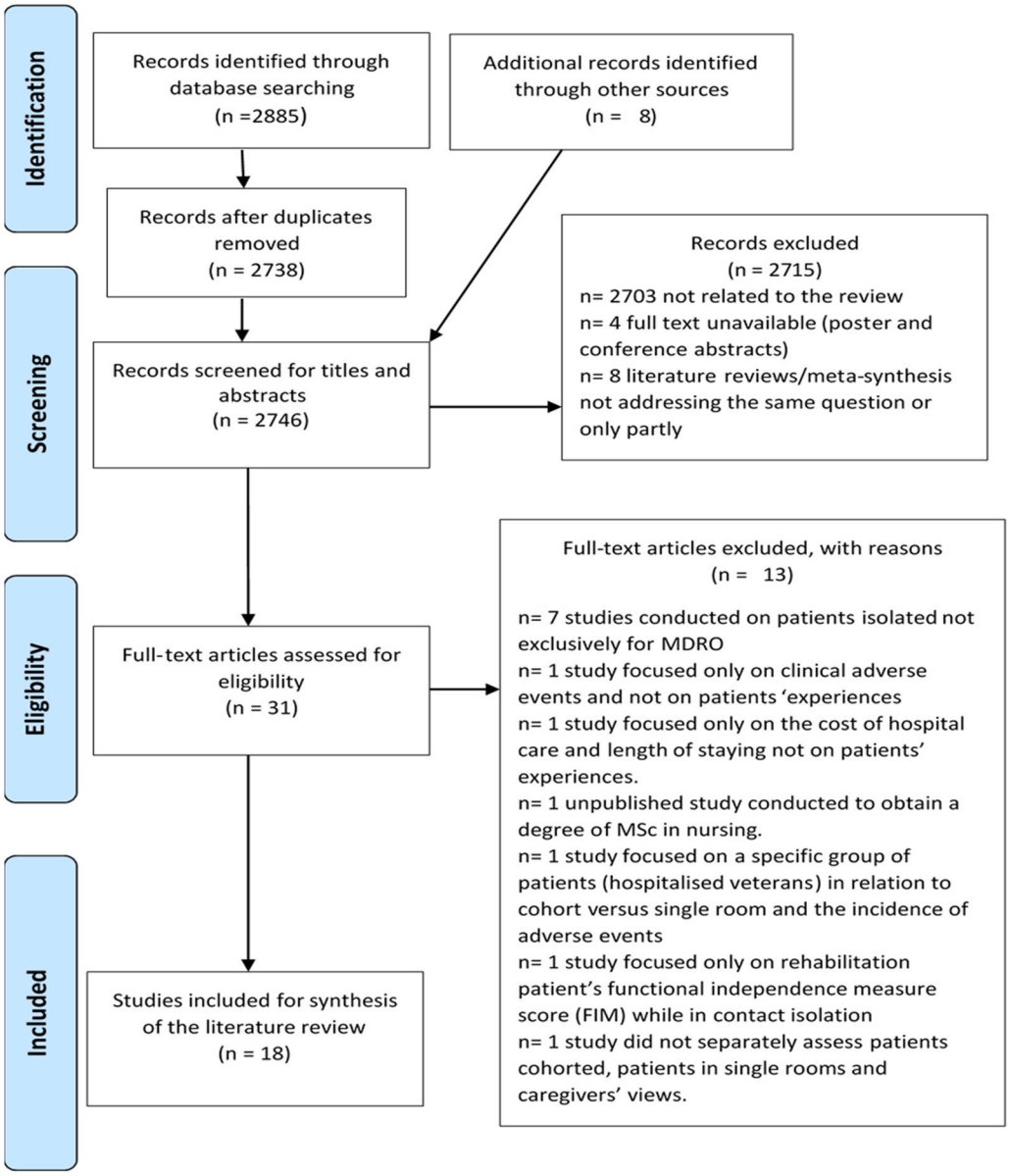

Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses flowchart reporting the search strategy results. MDRO, multidrug-resistant organism.

limiting the transparency of the research process. While the mixed-method designs[69-71] have attempted a more comprehensive approach to the phenomena, their results appeared to be diluted by the diverse forms of data collection, reducing the depth of the discussed outcomes.

DATA SYNTHESIS AND NARRATIVE OF THE FINDINGS

The thematic analysis and the narrative synthesis of all of the studies resulted in 3 main categories: (1) privacy versus loneliness; (2) emotional responses to isolation; (3) quality of care, recovery, and safety in isolation.

Category 1: Privacy versus loneliness

Participants shared mixed thoughts regarding the advantages and disadvantages of being cared for in isolation. To some, the privacy of being cared for in isolation was seen as a privilege compared to other patients in shared wards.[60,64,65] Some participants viewed their isolation room as similar to having a hotel room ("it's been like a 5-star hotel in here")[65] fitted with home comforts and private facilities[60] allowing them privacy and dignity.[64,65,69] Being in a more private space offered by single rooms led some patients to feel more relaxed while hospitalized.[63,69] The isolation appeared to provide some patients with an opportunity to feel more in control[63] as they adjusted to their health conditions or improved their family interactions during visiting times.[69]

By contrast, in some studies, an oppressive sense of loneliness and confinement permeated the participants' hospital experiences and affected their relationships with their families and staff. Feeling lonely was voiced by most patients in 7 studies.[64-68,70,71] Confinement was viewed as segregation and/or incarceration making patients feel abandoned and neglected by hospital staff ("closed up in one room and shut away")[66] or like being in a bloody prison."[65] Some felt that isolation restricted their human rights, for example, as this patient recalled, "(it) feels like certain rights and privileges have

been limited … (I feel) limited in (my) personal freedom"[71] and that health care professionals (HCPs) lacked respect for patients as human beings.[70]

Difficulty in contacting HCPs, due to the location and type of the isolation room,[63] amplified feelings of loneliness[63,65,66,68,71] with some participants disclosing a belief that being allocated to single rooms made HCPs delay visiting or engaging in communication with them.[63,64,66] This perception was worsened by the personal protection equipment (PPE) required by the HCPs before entering patients' rooms. The PPE was a barrier; it was viewed as another means to keep others at a distance and thus a hurdle between self and others.[63,65,66] As a result, patients felt even more isolated and lonely.

In summary, 2 aspects are highlighted in this category: some participants were tolerant toward the isolation measures in exchange for more privacy and the comfort of a single room. For others, feelings of loneliness and abandonment were amplified by being cared for in confined spaces with limited social interactions.

Category 2: Emotional responses to isolation

A range of emotional responses were reported across studies, including stigma, anxiety, and depression. Patients battled with feelings of anger, frustration, neglect, fear, and a sense of stigma.[54,63,65,66,68,70,71] Some felt unwelcome, ashamed, and "dirty."[68,70] Some felt guilty as well as a danger to others[63,68] leading them to question their responsibility to society ("It makes you worry, because am I really that bad to society? It really did make me think I must be really dangerous to society").[59] The lack of physical contact with others amplified these feelings. Meanwhile, having a visible sign, such as a "caution" note displayed outside their room, embarrassed some patients.[65] When patients were visited by HCPs, their use of PPE made patients feel dirty and embarrassed[64,66,68] as evidenced by the following statement: "it feels like that you are contaminated… to see them dressed in protective gear, you feel downgraded."[62]

In addition, some patients experienced emotional distress and felt that emotional support was lacking,[70,71] particularly among those reporting fluctuations in mood that resulted from isolation.[63] Patients felt anxious due to the lack of attention and understanding from HCPs.[63,70] "Nobody understood why I was very upset or anxious."[70] The reverse was true when anxiety was better understood and managed by staff.[66]

Raised levels of anxiety and depression were reported in 7 of the 9 quantitative studies[54,55,58–62] and in 1 of the 3 mixed-method studies.[69] Authors in 1[54] out of the 7 suggested higher levels of anxiety and depression were most commonly reported amongst those who were cared for in isolation compared with those not in isolation. The authors of another study[59] reported greater levels of depression amongst those who were cared for under contact precautions, while others[60,62] found no significant differences between the isolated and non-isolated participants. Various factors were associated with higher levels of anxiety and depression, including a diagnosis of MRSA,[54] being elderly,[54] being female,[60] and having lower levels of education and lower incomes.[60] Length of stay was also suggested as a significant factor in increased anxiety and depression.[54,58,59,62,65] For example, the authors of 1 study[58] highlighted that shorter periods of isolation (24-48 hours) were not shown to be associated with higher levels of anxiety and depression. Conversely, Day et al[62] suggested that, irrespective of the length of stay, hospital admission was already a trigger for anxiety and depression. One study[61] conducted in Singapore established that higher levels of depression and anxiety were more likely to be reported amongst those cared for under contact isolation in a cohort cubicle (not a single room) compared to those cohorted but not in isolation, suggesting that it may be the infection or colonization rather than the single room isolation that leads to negative emotional experiences.

Overall, the included studies suggested multiple elements such as lack of contact, HCP attitudes, length of time in isolation, gender, age, and cultural and socioeconomic background that may influence the emotional response to being cared for in isolation. However, only 4[54,55,59,61] of the 7 quantitative studies clearly indicated an increase in either anxiety or depression amongst those isolated in single rooms. Thus, evidence of the impact of single rooms on depression and anxiety is inconclusive.

Category 3: Quality of care, recovery, and safety in isolation

The majority of patients considered the isolation measures necessary to protect staff and others from becoming infected.[63,65-67] This appeared to demonstrate their awareness and a degree of knowledge and understanding about the importance of IPC. However, the care received by patients placed under contact precautions was perceived as poorly coordinated at times,[70] substandard, and some patients believed they received second-best treatment during their hospital stay.[63,66,68] This was clearly expressed by 1 participant,[63] "They tell me that they have got 24 other patients to care for, and I say, look, I'm the 25th and I count just as much as they do". These patients thought staff delayed giving pain relief, and neglected their basic personal needs, and spent less time with them.[56,63,70] When the care received was felt to be poor or inadequate, this was viewed as a setback to their recovery[63,64,68] as recalled by a participant: "It was like I was shut-out from the stroke treatment and therapy, I felt it was a big step down".[68] Some patients[64,68] felt that their rehabilitation was compromised.[57,64,68,69] Nonetheless, these negative views were not shared by everyone.[70] There was some indication that negative perceptions of the standard of care may be influenced by the length of time spent in isolation, with shorter stays resulting in more positive reports.[58]

The majority of patients are in isolation[63,64,66-68] thought staff were inconsistent while implementing IPC measures such as hand hygiene and the use of PPE. This was seen as unsafe, indicating an overly relaxed attitude from staff, which resulted in a negative view of their care. Some expressed strong feelings of disappointment, such as, "I was totally shocked".[68] To a certain degree, some patients viewed their infection or colonization by AMR organisms as potentially linked to negligence within the health care system[63,64,66,68] along with a lack of IPC knowledge from staff.[63,66-68] When the staff appeared unable to demonstrate and apply the expected evidence-based practice, patients felt unsupported and fearful about their illness and their future health.[66,67] The participants thought that HCPs should have done more to provide them with an acceptable standard of safe care.[63,64,66-68,70] Some evidence suggests that being placed in hospital isolation might increase the risk of potential harm.[56,57] The authors of 1 study in particular[57] reported adverse events such as fewer recorded vital signs and incomplete care plans among patients who were cared for in isolation compared to those who were not isolated. In addition, patients being cared for in isolation reported dissatisfaction with the quality of care received.[57]

In summary, being cared for in isolation and the associated restrictions were considered necessary to protect staff and others. However, some patients perceived the care they received as being substandard and potentially compromising their recovery.

DISCUSSION

The aim of this systematic review was to identify, appraise, and synthesize the available published evidence with a view of answering the following question: "What is the patient experience of being cared for in isolation for IPC when infected or colonized by

AMR organisms?". Our attention focused on the evidence referring to patients placed in contact isolation, which is recognized as the most "challenging" and controversial TBP to implement.[43,44]

We acknowledge that this review's findings are broadly in line with those of existing reviews in the field. However, some of these reviews[39] only included studies that focused on the consequences of being cared for in isolation under different TBPs by measuring the responses of isolation for IPC rather than exploring the adult experiences of being cared for in contact isolation when affected by AMRs. Our review included 18 studies from different methodological designs: quantitative, qualitative, and mixed method. This has highlighted what research has been conducted and which methods and design have been employed to understand and explore the hospitalized patients' experiences of isolation in relation to AMR infection and colonization. It has also provided an opportunity to appreciate and value the complexity of this subject and the difficulties experienced by the patients within these studies.

Our findings were thematically blended into a narrative synthesis offering an in-depth appreciation of the patients' experiences under contact precautions reported in previous research. We were able to achieve this perspective by combining different studies from diverse research designs; this allowed for an original interpretation of the available evidence.

The first category, "Privacy versus loneliness," reflects the dichotomy of views expressed by participants, with both positive and negative perceptions reported. This finding supports the review conducted by Mutsonziwa et al,[36] Vottero et al,[37] and Purssell et al.[40] These reviews, although focused on the diverse aspects of being cared for in isolation, concluded that being hospitalized under TBPs has negative consequences for patients who view IPC measures as necessary but also see those measures as a subtle form of segregation.

Single rooms were an optimal and comfortable solution for some participants, who felt safer and protected, and individually cared for, by offering them privacy and dignity. This supports the point made by the Dignity in Care campaign,[72] which suggests modern hospitalized patients seem to prefer private spaces where receiving treatment would cause less embarrassment. As a result, some national policies have driven the implementation and construction of new hospitals with 100% single rooms[73,74] to address person-centered care[75] while containing the spread of HAIs and AMR.[18,21]

Nonetheless, other participants found single rooms to be limited spaces that kept them apart from others, instilling feelings of loneliness. This point has also been the subject of ongoing debate amongst clinicians and IPC specialists[76] with a particular focus on the psychological aspects of patient well-being while already sick and hospitalized in single rooms and those patients who may crave more social interaction.

In addition, poor interaction or a lack of interaction or relationship with HCPs appeared to complicate patients' feelings towards single rooms. Communication was one of the key elements shaping participants' perceptions of being hospitalized under contact precautions, but it was not the sole determinant or defining factor in the whole experience.[64,66] While participants appeared to be more consciously aware of their conditions and subsequently more likely to accept the imposed limitations,[66,68] this finding has shown the need to establish an open, trustworthy, and ongoing information channel between HCPs and patients and their families. Thus, HCPs should aim to actively engage in clear communication with patients cared for in contact isolation, thereby building a sense of inclusiveness that would support patients' and their families' right to privacy, as well as reducing or limiting feelings of confinement and loneliness. Common issues with communication and social interaction with HCPs have been widely reported by other reviewers.[36,37,39,42]

From the evidence retrieved it was difficult to untangle the 2 opposing realities of valuing privacy against feelings of loneliness.

Our second category, "Emotional responses to isolation," reflects the reported experience of patients going on an emotional journey. This journey included a combination of different responses, including stigma, anger, and frustration as outcomes of being or feeling confined and excluded. Similar findings have been reported by the meta-synthesis by Mutsonziwa et al,[36] of 8 qualitative studies that included studies on patients' experiences of being infected by multidrug-resistant organisms and under diverse TBPs, showing that patients felt "shut off" and kept away from others. They developed a sense of stigma related to their infection situation. Equally, the review from Gammon et al[42] assessed 14 reported instances of stigma related to source isolation without differentiating the typology of TPBs. Their findings appeared to suggest that stigma has a negative effect on hospitalized patients cared for in isolation for IPC.

This review reported similar findings; however, our synthesis has highlighted the challenge of understanding how far these psychological emotions were generated by external elements and/or personal reasons. Due to this sense of uncertainty, HCPs should aim to support patients in contact isolation to avoid them experiencing negative outcomes such as stigma. In addition, we believe that more empirical studies are needed to explore the differences in responses between patients infected, and those only colonized by AMR and placed in contact isolation in light of the current dynamic changes in IPC measures to curb the rise of AMR.[11,13]

In parallel with other reviewers,[34,40] we noted that quantitative studies predominately measured and gauged the effect of contact isolation on patients' care and their well-being. As presented by Morgan et al[34] and Purssell et al,[40] assessing symptoms of depression and anxiety as a consequence of being cared for under contact precautions proved to be challenging due to the nature of the evidence, mostly observational study from single centers and methodologically weak, which made the reliability and generativity of the results difficult to appreciate.

The evidence reviewed found the results on levels of anxiety and depression between patients hospitalized in contact isolation and those not isolated, inconclusive with some indication that length of stay in isolation influenced patient response.[58,62] Adding a longitudinal aspect to these assessments may have allowed a better view of the cause-effect relationship over a longer period of time.

The length of stay in isolation demonstrated an interesting aspect worthy of consideration while reviewing and assessing patients' experiences of being cared for in contact isolation and their physical, social, and psychological well-being. According to some of the studies reviewed[58,60,62] the time spent in isolation was key to leading the participants' responses shown by the questionnaires. We recognize that the context of contemporary health care is changing in several ways for example, length of hospital stay and routine preadmission AMR screening[16,77] and complex targeted antibiotic therapy.[78] Hence, shorter periods of isolation may become a worldwide common practice and widely accepted. At the same time, if the implementation of an AMR admission screening process reduces unnecessary contact precautions,[71] this would avoid causing negative feelings such as loneliness amongst patients who would otherwise be placed, pre-emptively, in contact isolation.

While shorter isolation times are broadly recognized, contact isolation is still a requirement to prevent and curb the transmission of HAI and to contain the growth of AMR organisms[6,8,9,15] which appear more alarming now than ever.[12,14] To this end, it is vital to reflect on the fact that patients who are hospitalized in contact isolation are predominately elderly and frail and perhaps in need of a longer recovery time. Hence, the time spent in isolation should be particularly considered by HCPs who care for the elderly.

Our synthesis also emphasizes how demographic elements such as gender, age, cultural, and socioeconomical backgrounds are latent determinants of some emotional responses from patients being cared for in contact isolation. As presented by some of the evidence[54,55,59,60] higher levels of anxiety and depression were attributed to a combination of female gender, older age, and low incomes. However, this has only offered a correlational connection between individuals and their presented feelings in relation to being cared for in isolation. These factors are important and integral parts of each person's life that do not change when someone is hospitalized. For this reason, the care provided to these patients should be individualized and take their personal circumstances into consideration.

A much broader and attentive approach to patients cared for under contact precautions and their hospital journeys needs to consider the biopsychosocial consequences of IPC and its implications in everyday life.

Our final category, "Quality of care, recovery, and safety in isolation," suggests that being cared for in contact isolation may be associated with safety concerns primarily due to reduced contact time between patients and HCPs.[56,57] Again, this finding is comparable to those from other reviews.[33-35,39,40] However, our scope was to capture individuals' experiences of being cared for under contact isolation rather than assessing the safety of the care received. We propose a timely and personalized delivery of patient care to every patient, particularly those hospitalized under contact precautions. Likewise, we encourage HCPs to increase their visibility and, where possible, to actively interact with patients hospitalized in contact isolation for IPC.

In our review, patients' worries were aggravated by staff being inconsistent with the use of PPE and the standardized use of TBPs, for example, demonstrating poor hand hygiene. This point does not intend to criticize the role of HCPs, who are often overstretched. Instead it is an acknowledgment of how the level of staffing is crucial in delivering good quality care and how education and training are pivotal in supporting IPC measures.[79] Every patient should be adequately engaged with their health and care. In particular, those infected and/or colonized with AMR organisms and HAIs should be informed about IPC measures and their health condition.[80-82] This represents an opportunity for HCPs to increase and facilitate patients' ability to self-care.[38] At the same time, it will increase patients' knowledge and understanding of their conditions, improving their health literacy which is regarded as essential to leveling and reducing some health inequalities.[83,84]

It is worth remarking that from the evidence reviewed, when HCPs clearly explained the isolation measures to patients cared for under contact precautions, these patients had better awareness of their personal health status.[66,68] Thus, knowledge and understanding of infection and/or colonization and the related IPC measures were important elements in shaping the individual experiences of being cared for in contact isolation.

STRENGTHS AND LIMITATIONS

A key strength of this review is the focus on the patient experience of contact isolation while infected or colonized by a range of different AMR organisms, while previous reviews have examined aspects of the isolation experience, none have focused on the increasing problem of resistant organisms.

The limitations of this review are determined by the nature of the evidence retrieved. These were geographically dispersed and generated by diverse methodological designs. The findings from the evidence were to some extent contradictory, with common methodological limitations. None of the included studies adopted an in-depth qualitative approach to explore the full range of factors that may influence the patient experience of care.

In addition, the inconsistent method of defining and classifying the terms "isolation," "contact isolation," and "contact precaution," used across the papers, was to some extent confusing; this made searching and screening of the evidence challenging. It may have led to papers being missed during the search strategy. We advise a universal scientific semantic utilization of the terms IPC and AMR.

Only peer-reviewed and published studies were included, as they were considered to be the best-quality available evidence.[85] Grey literature was not included; this could be considered a further limitation as a broader search in this direction may have yielded additional material to be added into this review extending its breadth.

The heterogeneity of the studies and their diverse characteristics prompted the reviewers to use a narrative synthesis framework.[46] It was iteratively implemented guiding an original synthesis of the current available evidence in the field. This process also benefited from employing the principles of thematic analysis from Braun & Clarke.[52] Management of the extracted data and its coding process were facilitated using NVivo 12.[53] This approach combined with the support from the qualitative analysis software led to a unique and bespoke blended understanding of the included evidence, highlighting perceived gaps in the literature. To our knowledge, this is the first review in the field of IPC conducted with this method.

CONCLUSIONS AND RECOMMENDATIONS

The use of TBPs such as isolation is common practice, and it is required to reduce HAIs and curb the growth of AMR.[24] However, being hospitalized in contact isolation may impact patients' physical and psychological well-being.[25–42]

This systematic literature review has suggested that the experience of being cared for in contact isolation when infected or colonized by AMR organisms could have been influenced by multiple factors, such as the reason for being in isolation, the imposed restrictions, the time spent in isolation, the nature of the accommodation, the patient's relationship with HCPs, the patient's gender, age, cultural aspects, and socioeconomic background. These factors and their implications for the patients' journeys warrant further investigation.

HCPs should treat each patient as an individual with biopsychosocial needs, particularly when IPC measures are required when personalizing clinical assessments. Clear communication about being cared for and placed in contact isolation, the mandatory protections, and the allocation to particular accommodation must be clearly explained to patients and families to avoid confusion and/or a sense of segregation. HCPs must be entirely supported by their organizations and should receive adequate training in confidently providing this information and the subsequent necessary care to these patients.

The contemporary context of being cared for in isolation when infected or colonized by AMR organisms has changed significantly since many of the included studies were published, with shorter hospital admissions, greater public preferences for privacy, and shifts in the policy for building all single-room hospitals. Given these changes, a further empirical study is required to explore and explain the present-day patient experience of being cared for in isolation for infection control purposes. This will enable the development of person-centered safe, effective health care practices in line with contemporary policy and practice directions.

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APPENDIX A. SUPPORTING INFORMATION

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.ajic.2023.04.011.

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