

خطر البكتيريا المقاومة، تقليل خطر انتقالها بين الممارسين الصحيين في المملكة العربية السعودية

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لقد انجزنا العمل

Abstract:

Antimicrobial resistance presents one of the global health challenges of modern times. Healthcare workers are at an enhanced risk because they are constantly exposed to various microbial populations. This is especially relevant in the Kingdom of Saudi Arabia a hub for migrant workers and pilgrims who enhance the potential for resistant pathogen introduction and spread. It reviews the peculiar vulnerabilities of healthcare professionals in the central region of Saudi Arabia to AMR, that includes resistant infections which are hard to treat and potentially transmittable with heavy psychological loading. The paper looks into practical measures and interventions in mitigation against these risks, with a view toward practical strategies in a two-pronged approach: protection for health care workers and reduction as far as possible of the onset and spread of AMR within health facilities.

Results:

This survey of healthcare workers therefore offered an opportunity to tap their experiences, perception, and practices regarding AMR in Saudi Arabia. The main findings are as follows:

Level of Confidence and Training: Although the responses are varied concerning the confidence in explaining AMR, a majority had received some formal training on this topic within a year.

Practices and Awareness: Most respondents believed that hand hygiene plays a significant role in preventing AMR. Plus, the knowledge of specific antibiotic prescription guidelines was varied. However, concerning awareness of the serious problem represented by AMR for the facility, many answered in the affirmative.

Patient Education: Many health care workers accepted the responsibility for patient education with regard to the emergence of AMR and reported adequate knowledge with concomitant resources to prevent AMR.

Public Awareness: There was strong support for public awareness campaigns to reduce AMR.

Effective Practices: It was identified that new guidelines on antibiotic prescribing and better antibiotic stewardship were effective practices.

The most common challenges for the implementation of AMR prevention strategies in this study were a lack of awareness and time constraints. The respondents demanded refresher trainings on updated guidelines, antibiotic stewardship, and communication skills.

Conclusion:

Controlling the risk of AMR among healthcare workers working in Saudi Arabia's central region is multifaceted. Of the many strategies, hand hygiene stands as the cornerstone for the prevention of resistant organisms. This is coupled with robust infection control policies and a culture of appreciation manifested by rewarding staff for their adherence to health facilities, which go a long way in reducing risks for AMR. Applying these measures first in the central region of Saudi Arabia will help make its healthcare system more resilient to this global threat and protect its dedicated healthcare workforce as well as the patients it serves.

Chapter One
Introduction

introduction:

The health sector:

is at the forefront of fighting an emerging threat antimicrobial resistance (AMR). This phenomenon occurs when microbes, such as bacteria, viruses, and fungi, acquire the ability to withstand the effects of medications designed to eliminate them. The consequences of this resistance are complications in treating infections, leading to detrimental effects (Alsharif, 2021).

Healthcare workers, the very heroes on the frontlines of patient care, are particularly constant exposure to various pathogens vulnerable to antimicrobial resistance (AMR). The creates the perfect environment for resistant strains to emerge and spread(Alsharif, Ali et al., 2021)This introductory section sets the stage for a deeper exploration of).(2021 this critical issue, including the specific risks healthcare workers face, mitigating strategies to be explored, and proactive measures against this rising threat.

As a major international hub for pilgrimages and a leading destination for migrant workers in the Gulf and Middle East region, the Kingdom of Saudi Arabia has accumulated vast experience and expertise in managing various pandemic outbreaks, including the MERS pandemic has undoubtedly presented 19-virus(Alsharif, 2021). While the COVID it has also prompted a shift in priorities, ,significant challenges for the Saudi government from a focus on state security to a greater emphasis on human welfare(Alsharif, 2021).

Considering the strategic importance of the healthcare sector in Saudi Arabia, it is crucial to delve into the unique challenges faced by healthcare workers in the kingdom, in order to develop effective strategies to mitigate the risk of antimicrobial resistance and ensure the Mansour et al., 2021)This research paper will -resilience of the healthcare system.(Al therefore provide a comprehensive examination of the specific risks and vulnerabilities that healthcare workers in Saudi Arabia face in the context of antimicrobial resistance, analyze the most effective strategies and interventions that can be implemented to address these challenges.

In conclusion, this study will culminate by proposing a comprehensive suite of proactive measures that can be implemented to safeguard the healthcare workforce and the resilience.against population at large, with the overarching goal of reinforcing the overall the looming threat of antimicrobial resistance in the Kingdom of Saudi Arabia.

Problem Statement:

The risk posed by antimicrobial resistance is gaining pace. It is among the most directly puts a question mark on the role of imperative threats to healthcare globally and healthcare workers at the epicenter of this crisis. The constant bombardment of thoroughly diversified ranges of microbes in a healthcare setting provides fertile ground for resistant pathogens to output and transmit.

Kingdome ofSaudi Arabia serves as a hub for both migrant workers and pilgrims, increasing the risk of healthcare staff developing AMR due to frequent contact with different kinds of infections. It reviews the unique vulnerabilities of Saudi Arabian healthcare professionals to antimicrobial resistance to enhance such resilience within the healthcare system . It also considers other practical strategies and interventions that could be applied to help reduce these risks.

The problem manifests in several critical ways:

Increased Difficulty in the Treatment of Infections: If common antibiotics become resistant, treatment for simple infections becomes challenging. This may lead to prolonged .threatening complications-illnesses, increased healthcare costs, and even life.

Transmission risk: Such a health worker may carry AMR pathogens to his patients, especially those with deficient immunity. This then creates a ripple effect, which may further endanger whole populations of patients.

fear of contracting or spreading resistant infections is a Psychological Stress: The persistent one and may prove overwhelming to healthcare workers, leading to being and, -psychological severe stress that can result in manifestations affecting well .hence, burnout.

faceted approach to solve the problem., therefore, the treatment for -It thus requires a multi way: protecting healthcare workers and, at the same time, reducing the -it must be two onset and spread of the AMR pathogen in healthcare facilities.

the Study Significance of:

There is a good number of reasons as to why there is a need to understand the risks of antimicrobial resistance to healthcare workers:

Protection of Patient Safety: AMR threatens patient safety since it makes the involved infections more difficult and costly to treat. Therefore, this research will focus on the assessment of exposure risks for healthcare workers to finally strive for improving patient outcomes.

Curbing the Spread of AMR: Healthcare workers can act as a bridging population in the transmission of resistant pathogens. The risk mitigation strategies taken for this group can break the chain of transmission, hence slowing down the spread of AMR globally.

Optimization of Health Care Resources Allocation: AMR increases health costs through -additional days of hospitalization and expensive drugs. Therefore, this study identifies cost effective interventions that would protect health care workers and, at the same time, reduce the transmission of AMR in health care settings to optimize resource allocation.

A healthier workforce can be fostered by reducing psychological effects that negatively impact healthcare workers due to AMR. It is expected that this current study will, therefore, create a better and safer work environment for health professionals by helping in curtailing stress at work and further strengthening enjoyment of work.

based practices whereby the findings of this -It can aid in the development of evidence based protocols and -study are basically applied in initiating and executing evidence guidelines toward the effective management of the risk of AMR in healthcare workers. This study accrues relevant knowledge for changing clinical practice variability to enhance patient care across all health settings.

By investigating and tackling the exact challenges that healthcare workers face, this study gives itself an excellent opportunity to significantly contribute to combating antimicrobial resistance in the world at large.

Study Aims:

this study intends to comprehensively investigate the risk of AMR among ,Specifically healthcare workers for possible intervention and control. In pursuit of this aim, the following key objectives will be focused on: **Assess the Prevalence of AMR Risk Factors:** a range of possible risk factors that put healthcare workers at increased risk of Identify exposure to and transmission of AMR. These might include but not be limited to the following: pattern of prescription for antibiotics, adherence to infection control practices, places within healthcare facilities, etc. **Assess the Impact of AMR on Health Care Workers:** A study into all possible effects of the exposure of health workers to AMR will be done. In that respect, this may relate to the estimation of the extent of infection by the antimicrobial resistance within a health setting, studying the psychological impact due to the risk of

acquiring an AMR, or analyzing the possibility of burnout related to this hazard. Design efficacious interventions that minimize the threat of AMR for healthcare workers where risks are identified. This may include focused educational programs on AMR awareness, best practices and offenses, hand hygiene compliance enhancement strategies and exploring PPE specifically designed to reduce the transmission of AMR. Disseminate Knowledge and Good Practice: The study aims to disseminate the research findings among all relevant stakeholders, from healthcare professionals to policymakers to public health based guidelines -up some evidence organizations. This would go a long way in building and interventions with which AMR risk might be effectively controlled inside healthcare settings.

Study questions:

Prevalence And Risk Factors Of Antimicrobial resistance:

What is the prevalence of risk factors of AMR among different groups of the healthcare worker populations, such as doctors, nurses, and technicians, in Saudi Arabian healthcare facilities?

How are facility-driven antibiotic prescribing practices related to the AMR risk among healthcare workers?

Effect of AMR on healthcare workers

How common are AMR infections among the healthcare workers studied in Saudi Arabia?

Is there any association between psychological distress, say, stress or anxiety, and burnout from exposure to AMR pathogens and healthcare workers?

What are the perceptions and attitudes of health workers concerning risks associated with AMR? What are the perceived roles of health workers in preventing and spreading AMR?

Mitigation and Education:

Which health education interventions be most effective in bringing about changes in knowledge, attitude, and practices on AMR prevention and control among health workers?

Are specific types of PPE associated with a reduced risk of the transmission of AMR to healthcare workers?

What has been the effect of implementing comprehensive, evidence-based antibiotic stewardship programs on AMR rates toward housemen?

Dissemination and Collaboration:

Which methods are known to be successful in the dissemination of research findings and best practices to reach out to stakeholders (healthcare workers, public health organizations, and policymakers) regarding the mitigation of AMR risks?

How can interaction and exchange of knowledge among institutions be more effective for helping to lower this global risk of AMR among healthcare workers? These revisions aim for conciseness and direct relevance to your core research goals.

Study Assignments:

Here are some possible assignments for further study on the risk of acquiring AMR by healthcare workers:

Literature Review:

Conduct an integrated review of the literature on AMR risk in healthcare workers. Search for recent studies in academic databases using relevant search terms such as "antimicrobial resistance," "healthcare workers," "infection control," "antibiotic stewardship," and ".psychological impact"

Using the results of these studies as a guide, analyze and summarize key findings against themes identified, including knowledge gaps.

Summarize the research in this area to date, along with its implications for your study.

Data collection:

Depending on the scope of your study and ethical considerations, you may want to collect data from healthcare workers directly. These are:

Questionnaires: Design and implement questionnaires among healthcare workers to knowledge, attitude, and practice concerning AMR establish current.

depth interviews to be conducted with health workers in order to secure a -Interviews: In better understanding of their experiences concerning risks of AMR and the impact.

Data Analysis:

Analyze the data which has been obtained, using the applied method.

Study the impact of an antibiotic stewardship program on the risk of AMR among healthcare workers. Dissemination of Findings:

The results of the research, together with the methodology applied and the conclusions, should be summarized in a report. Such a report could be prepared for submission for reviewed journal or presented at a proper conference. -publication in some reputable peer Develop educational materials or presentations to share the findings with healthcare workers and relevant stakeholders. Consider developing an article or blog posting to the general public to help build awareness of the risk of AMR in healthcare settings. Note that -this is just some suggestion for the study assignments. Specific tasks will depend on a case case basis through research design, available resources, and ethical considerations-by.

The theoretical principles of the study:

A sound theoretical foundation is critical to understanding the risk of AMR among health care workers and thence developing effective mitigation strategies. The study had some major theories that would be applied in an attempt to understand factors that drive the behavior, perceptions and practices of healthcare workers concerning AMR. The theories thus explain how they influence the adherence of healthcare workers to infection control measures on the transmission of AMR. Some of the theoretical principles of the research on risks of AMR among healthcare workers include:

Social Cognitive Theory: According to SCT, recurrent personal activities, together with environmental and behavior events, influence individuals' behavior. Through this, the current research will review how health care workers' knowledge and attitudes, together with their access to infection control resources, influence their practices and hence their risk of exposure to the AMR.

Risk Perception Theory: Largely, the behavior of individuals is guided by the way they perceive the risk. This study will examine how healthcare workers' perceptions of AMR risk impact their adhering to recommended practices for mitigating that risk.

Study Focus: The research will be based on healthcare workers working within medical facilities in the central region of Saudi Arabia, and try to find out how knowledge and understanding towards the problem of AMR can influence resistant pathogen transmission. The study will also evaluate whether the insertion of a reward system adds advantages to raising awareness and enhancing strict adherence to reduction practices. In particular, it find out what possible strategies can increase health care workers' commitment to infection control measures underlying controls at the root of containing the spread of AMR in healthcare settings.

Methodology and research methods:

This study set out to determine the risk of antimicrobial resistance among healthcare collection to deeply workers methods approach. It would be a quantitative method in data understand the phenomenon under study.

Survey Method:

administered questionnaire will be designed to obtain information on knowledge, -A self attitudes, and practices regarding AMR among healthcare workers. Healthcare workers targeted in this study come from all levels of the selected healthcare facility, for example: ICU, emergency room, and general ward. These will be measured through:

Knowledge about AMR and transmission routes.

Attitudes toward infection control practices and antibiotic stewardship.

reported adherence to recommended practices. Perceived risk of being exposed to -Self AMR.

Data Analysis:

the data collected from each administered survey will then be analyzed statistically to between variables. Part of this may indicate the establish trends and possible relationships relations that exist among demographic data of healthcare workers, departmental backgrounds, or experiences with their knowledge, attitude or reported practices relating to AMR.

Chapter Two

Previous Studies

Introduction:

Previous studies have pointed out the great threat of antimicrobial resistance in Saudi Arabia and its toll on healthcare workers. The 2016 study by Zowawi referred to the fact that there is a vital necessity for addressing AMR in the country, therefore requiring a multi-sectoral approach that encompasses surveillance, infection control, and antimicrobial stewardship. In an extension, Iyer et al. demonstrated that the incidence rate for MRSA-colonized healthcare workers was very high in Saudi Arabia, thus underlining the dire need for putting in place adequate control measures to prevent the spread of resistant organisms in healthcare settings.

Adding to this, a ten-year study by Balkhy et al. in 2007-2016, with findings published in their paper "Ten-year resistance trends in pathogens causing healthcare-associated infections; reflection of infection control interventions at a multi-hospital healthcare system in Saudi Arabia," revealed that Carbapenem and Vancomycin-resistant Enterococci have shown unwanted rises in the tertiary care set-up, which indicates that well-built antimicrobial stewardship programs including monitoring and feedback mechanisms had become more than ever critically required to combat this menace of AMR in Saudi Arabia.

In various research studies around the world, one theme that has emerged is that healthcare workers are under increased risk from multidrug-resistant organisms. Research has repeatedly demonstrated through such studies that MDROs, like MRSA, are quite prevalent in healthcare professionals—this being part of the occupational hazard associated with the profession. A 2014 study published in BMC Infectious Diseases provided an example of the extent of MRSA carriage among healthcare workers working in non-outbreak settings in Europe and the USA. Another 2019 study brought attention to occupational risk with different types of MDROs to accentuate still further the vulnerability of health care personnel. These findings underline the requirement for comprehensive strategies aimed at protecting healthcare workers from MDRO infections by robust infection control protocols and appropriate use of personal protective equipment.

Previous Studies

Antimicrobial resistance in Saudi Arabia. An urgent call for an immediate action. Hosam M. Zowawi. Saudi Medical Journal.

September 2016, 37(9)935940; DOI: <https://doi.org/10.15537/smj.2016.9.16139>.

Abstract:

Antimicrobial resistance (AMR) is increasingly being highlighted as an urgent public and animal health issue worldwide. This issue is well demonstrated in bacteria that are resistant to last-line antibiotics, suggesting a future with untreatable infections. International agencies have suggested combating strategies against AMR. Saudi Arabia has several challenges that can stimulate the emergence and spread of multidrug-resistant bacteria. Tackling these challenges need efforts from multiple sectors to successfully control the spread and emergence of AMR in the country. Actions should include active surveillance to monitor the emergence and spread of AMR. Infection prevention and control precautions should also be optimized to limit further spread. Raising awareness is essential to limit inappropriate antibiotics use, and the antibiotic stewardship programs in hospital settings, outpatients, and community pharmacies, should regulate the ongoing use of antimicrobials.

Antimicrobial resistance (AMR) in bacteria is emerging and spreading rapidly worldwide. This phenomenon is nowadays affecting public and animal health dramatically on a global level. The discovery of penicillin in the last century provided significant advancements in modern medicine, as well as our ability to treat commonly encountered infectious diseases, one of the biggest killers during the pre-antibiotics era. Many of life-saving interventions, such as cancer chemotherapy and major surgeries depend on effective antimicrobials to succeed. Unfortunately however, the current dependence on antibiotics - whether to treat, prevent, or stimulate food animal growths - have exponentially increased this resistance. When antibiotics are used, selective pressure is created, and possibly forcing the exposed bacteria to mutate or acquire pieces of DNA to become antibiotic resistant. The selection pressure resulting from the overwhelming use and misuse of antibiotics is exponentially supporting the AMR phenomenon. Despite this known fact, approximately 10 million tons of antibiotics are globally used every 10 minutes, which mostly are not related to justified medical use. As a result to the global march of AMR, common infections, such as urinary-tract infections are becoming difficult to treat. This is mainly due to bacteria that are resistant to last-line antibiotics, or even pan-drug resistant that are not responding to any commercially available antibiotics. The multidrug-resistant (MDR) pathogens are spreading rapidly in many parts of the world causing severe medical and economic consequences. It is estimated that at least every 10 minutes a patient dies in the USA or Europe because of fatal infections caused by antibiotic resistant bacteria. This article gives a brief overview on the current situation of AMR in Saudi Arabia and the immediate actions needed to tackle this issue.

In conclusion, AMR is a global issue that requires tremendous attention. International agencies have suggested recommendations and plans to combat AMR. It is now up to countries to take the lead and implement local actions plans to limit AMR. Saudi Arabia faces several challenges that can stimulate the emergence and spread of MDR bacteria. These challenges require cultivated efforts from different sectors to successfully achieve a significant control of AMR in the country. Actions should include active surveillance of

AMR on hospital-based, regional, and nationwide levels. Infection prevention and control precautions should also be optimized to limit the spread. Raising awareness of AMR is an essential mandate to limit inappropriate use of antibiotics, and the use of antimicrobial should be maintained by antibiotic stewardship programs not only in hospital settings, but also in outpatients and community pharmacies.

High incidence rate of methicillin-resistant *Staphylococcus aureus* (MRSA) among healthcare workers in Saudi Arabia.

Archana Iyer, Taha Kumosani, Esam Azhar, Elie Barbour, Steve Harakeh

Abstract:

Introduction: Nosocomial infections are normally hospital acquired. Nasal carriage of *Staphylococcus aureus* (*S. aureus*) is very common and may be transmitted via a hand-to-nose route. The objective of the present study was to screen healthcare workers for the colonization of their nasal cavities with MRSA. **Methodology:** The study group included hospital staff such as nurses, doctors, and technicians. The control group included university students. For isolation, nasal swabs were taken from the volunteers and cultured on mannitol salt agar media selective for *S. Aureus*. Suspected colonies were confirmed by PCR using specific primers for the coagulase and *mecA* gene. Typing of the coagulase-positive strains was done using restriction fragment length polymorphism (RFLP). **Results:** The results indicated an incidence rate of 76% among healthcare workers. This is in comparison with students who served as control and were negative for MRSA. Using RFLP, four different types of MRSA were confirmed.

In conclusion, our study on a limited population comparing healthcare workers who were constantly exposed to the pathogenic MRSA and students who were not exposed to the pathogen clearly shows that people in a healthcare setting are constantly at risk of acquiring, colonizing, and spreading MRSA. Although the volunteers who tested positive for colonization were asymptomatic, they are high-risk groups for transmission and dissemination to non-infected people. The percentage of nasal carriage of the healthcare workers was very much associated with the high-risk patient groups with whom they are in constant contact. Given the irrational use of antibiotics and the failure to comply with dosage regulation of antibiotics in the community, there is a high risk of transmission of nosocomial infections to the community, leading to outbreaks of community-acquired MRSA (CAMRSA). This clearly shows the need for formulating and implementing regular screening programs in hospitals and clinics to prevent the spread of nosocomial infections. PCR, a rapid tool for faster and definitive detection of the pathogen, can be used as a routine screening test in healthcare settings. It is important to formulate and implement awareness campaigns, hand sanitization practices, and regular screening programs to prevent outbreaks of MRSA infection.

Ten-year resistance trends in pathogens causing healthcare-associated infections; reflection of infection control interventions at a multi hospital healthcare system in Saudi Arabia, 2007–2016

Abstract:

Background: Studying temporal changes in resistant pathogens causing healthcare-associated infections (HAIs) is crucial in improving local antimicrobial and infection control practices. The objective was to describe ten-year trends of resistance in pathogens causing HAIs in a tertiary care setting in Saudi Arabia and to compare such trends with those of US National Health Surveillance Network (NHSN).

Methods: Pooled analysis of surveillance data that were prospectively collected between 2007 and 2016 in four hospitals of Ministry of National Guard Health Affairs. Definitions and methodology of HAIs and antimicrobial resistance were based on NHSN. Consecutive NHSN reports were used for comparisons.

Results: A total 1544 pathogens causing 1531 HAI events were included. Gram negative pathogens (GNP) were responsible for 63% of HAIs, with a significant increasing trend in *Klebsiella* spp. and a decreasing trend in *Acinetobacter*. Methicillin-resistant *Staphylococcus aureus* (27.0%) was consistently less frequent than NHSN. Vancomycin-resistant *Enterococci* (VRE, 20.3%) were more than doubled during the study, closing the gap with NHSN. Carbapenem resistance was highest with *Acinetobacter* (68.3%) and *Pseudomonas* (36.8%). Increasing trends of carbapenem resistance were highest in *Pseudomonas* and *Enterobacteriaceae*, closing initial gaps with NHSN. With the exception of *Klebsiella* and *Enterobacter*, multidrug-resistant (MDR) GNPs were generally decreasing, mainly due to the decreasing resistance towards cephalosporins, fluoroquinolones, and aminoglycosides.

Conclusion: The findings showed increasing trends of carbapenem resistance and VRE, which may reflect heavy use of carbapenems and vancomycin. These findings may highlight the need for effective antimicrobial stewardship programs, including monitoring and feedback on antimicrobial use and resistance.

Public Knowledge, Attitude and Practice towards Antibiotics Use and Antimicrobial Resistance in Saudi Arabia: A Web-Based Cross-Sectional Survey.

Ali Hassan A. Alnasser, Jaffar A. Al-Tawfiq, and Aqeela Ali H. Alnasser,
<https://doi.org/10.4081/jphr.2021.2276>

Abstract:

Background:

Antimicrobial resistance is a global issue that causes significant morbidity and mortality. Therefore, this study aims to assess knowledge, attitudes, and practices (KAP) of the general Saudi populations toward antibiotics use.

Design and method:

A cross-sectional, anonymous online survey was conducted from January 1 to May 11, 2020, across five major regions of Saudi Arabia. Participants (aged ≥ 18 years) were invited through social media to complete an online self-structured questionnaire. All data were analyzed by Statistical Package (SPSS v. 25). Descriptive statistics, Pearson's Chi-squared, *t*-tests, one-way analysis of variance (ANOVA), and Pearson correlation analyses were conducted.

Results:

Out of 443 participants, the majority ($n=309$, 69.8%) were females, 294 (64.4%) were married, 176 (39.7%) were 25-34 years of age, 338 (76.3%) were living in the Eastern Province, 313 (70.7%) had college or higher education, 139 (31.4%) were not working, and 163 (36.8%) had a monthly income of USD 800-1330. Overall, most participants demonstrated good knowledge and practice (88% and 85.6%, respectively). However, 76.8% had inadequate attitude score levels towards antibiotics use. Of all the respondents, 74.9% knew that not completing a full course of antibiotics may cause antibiotics resistance, 91.33% did not agree that antibiotics should be accessed without a prescription, and 94.04% will not hand over leftover antibiotics to family members. Factors associated with adequate knowledge were female, medical jobs, and higher income ($p<0.05$).

Conclusions:

Our findings revealed that while most participants were aware of antibiotics use and demonstrated good knowledge, good practices, they had negative attitudes towards antibiotics use.

Occupational Infection Risk with Multidrug-Resistant Organisms in Health Personnel a Systematic Review

Claudia Peters, Madeleine Dulon, Albert Nienhaus, Anja Schablon

Int. J. Environ. Res. Public Health 2019, 16(11), 1983;
<https://doi.org/10.3390/ijerph16111983>

Abstract:

The increase in multi-drug-resistant organisms (MDROs) in the last years has become a public health problem. MDROs are partially responsible for numerous nosocomial infections, extended hospital stays, high costs, and high mortality. In addition to methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococci (VRE), Gram-negative bacteria are also a key area of focus. The knowledge of MDROs among the medical staff in the occupational context is limited, with the exception of MRSA. Therefore, a systematic review was carried out to determine the occupational risk for employees posed by MDROs. The search included studies from the year 2000 onwards among personnel who had contact with MDROs. A total of 22 primarily cross-sectional studies in hospital or geriatric care settings were found, with large differences regarding number of participants, examination method, inclusion of a control group, and study quality. The most frequently examined pathogens were extended-spectrum β -lactamase (ESBL)-producing bacteria with a prevalence of 2.6–48.5%, VRE (0–9.6%), and MRSA (0.9–14.5%). There are only few qualitatively good studies available on MDROs' risk infection for employees in the health service. Any comparison of the results was limited by data heterogeneity. More research is required to describe the occupational risk of infection with MDROs.

Conclusions:

This review presents the existing studies on the occupational infection risk with MDROs among employees in the health service. It shows that only very few, high-quality studies are available worldwide on MDROs in health personnel. Often, only a few employees were investigated at the same time as patients. Any comparison of the results is limited by their heterogeneity. More high-quality research is needed in order to describe the occupational infection risk with MDROs. In the investigations, for example, a sufficient number of study participants, the inclusion of an appropriate comparison group, a detailed description of the survey, and a clear and comprehensible presentation of the results are required.

MRSA carriage among healthcare workers in non-outbreak settings in Europe and the United States: a systematic review.

Madeleine Dulon, Claudia Peters, Anja Schablon & Albert Nienhaus

Abstract:

A recent review estimated prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA) in healthcare workers (HCWs) to be 4.6%. However, MRSA carriage in HCWs in non-outbreak settings is thought to be higher than in an outbreak situation, due to increased hygiene awareness in outbreaks, but valid data are missing. The goals of this paper are to summarise the prevalence of MRSA carriage amongst HCWs in non-outbreak situations and to identify occupational groups in healthcare services associated with a higher risk of MRSA colonisation.

Methods: A systematic search for literature was conducted in the MEDLINE and EMBASE databases. The methodological quality of the studies was assessed using seven criteria. Pooled prevalence rates were calculated. Pooled effect estimates were identified in a meta-analysis.

Results: 31 studies were included in this review. The pooled MRSA colonisation rate was 1.8% (95% confidence interval [CI], 1.34%-2.50%). The rate increased to 4.4% (95% CI, 3.98%-4.88%) when one study from the Netherlands was excluded. The pooled MRSA rate was highest in nursing staff (6.9%). Nursing staff had an odds ratio of 1.72 (95% CI, 1.07-2.77) when compared with medical staff and an odds ratio of 2.58 (95%, 1.83-3.66) when compared with other healthcare staff. Seven studies were assessed as being of high quality. The pooled MRSA prevalence in high quality studies was 1.1% or 5.4% if the one large study from the Netherlands is not considered. The pooled prevalence in studies of moderate quality was 4.0%.

Conclusions: MRSA prevalence among HCWs in non-outbreak settings was no higher than carriage rates estimated for outbreaks. Our estimate is in the lower half of the range of the published MRSA rates in the endemic setting. Our findings demonstrate that nursing staff have an increased risk for MRSA colonisation. In order to confirm this finding, more studies are needed, including healthcare professionals with varying degrees of exposure to MRSA. In order to reduce misclassification bias, standardisation of HCWs screening is warranted.

Healthcare-associated infections by multidrug-resistant bacteria in Andalusia, Spain, 2014 to 2021.

Nicolás Francisco Fernández-Martínez, Mario Rivera-Izquierdo, Rocío Ortiz-González-Serna, Virginia Martínez-Ruiz, Pablo Lardelli-Claret, Adrián Hugo Aginagalde-Llorente, María del Carmen Valero-Ubierna, María Auxiliadora Vergara-Díaz, and Nicola Lorusso

Abstract:

Background: Multidrug-resistant (MDR) bacteria are among chief causes of healthcare-associated infections (HAIs). In Spain, studies addressing multidrug resistance based on epidemiological surveillance systems are lacking.

Aim: In this observational study, cases of HAIs by MDR bacteria notified to the epidemiological surveillance system of Andalusia, Spain, between 2014–2021, were investigated. Notified cases and their spatiotemporal distribution were described, with a focus on social determinants of health (SDoH).

Methods: New cases during the study period of HAIs caused by extended-spectrum β -lactamase (ESBL)/carbapenemase-producing Enterobacterales, MDR *Acinetobacter baumannii*, MDR *Pseudomonas aeruginosa* or methicillin resistant *Staphylococcus aureus* were considered. Among others, notification variables included sex and age, while socio-economic variables comprised several SDoH. Cases' spatial distribution across municipalities was assessed. The smooth standardised incidence ratio (sSIR) was obtained using a Bayesian spatial model. Association between municipalities' sSIR level and SDoH was evaluated by bivariate analysis.

Results: In total, 6,389 cases with a median age of 68 years were notified; 61.4% were men ($n = 3,921$). The most frequent MDR bacteria were ESBL-producing Enterobacterales (2,812/6,389; 44.0%); the main agent was *Klebsiella* spp. (2,956/6,389; 46.3%). Between 2014 and 2021 case numbers appeared to increase. Overall, up to 15-fold differences in sSIR between municipalities were observed. In bivariate analysis, there appeared to be an association between municipalities' sSIR level and deprivation ($p = 0.003$).

Conclusion: This study indicates that social factors should be considered when investigating HAIs by MDR bacteria. The case incidence heterogeneity between Andalusian municipalities might be explained by SDoH, but also possibly by under-notification. Automatising reporting may address the latter.

Theoretical framework:

Antimicrobial resistance is the phenomenon whereby microorganisms such as bacteria, viruses, fungi, and parasites change to counter the action of antimicrobial medicines designed either to kill the microbe or to prevent it from multiplying. It is a growing concern to global health, especially about a health care setting where the use of antimicrobials frequently appears as excessive.

A conceptual framework theoretically links concepts of antimicrobial use and infection control practices, knowledge, attitudes of healthcare workers, and contextual factors like cultural influences, health care policy, etc. in relation to risks for health workers in Saudi Arabia regarding antimicrobial resistance. One can understand what might be the contributing factors to AMR through these theoretical models, such as HBM, TPB, and SCT, besides identifying what strategies may prevent risk.

Conceptual Framework:

Such a theoretical framework on the risk of AMR to healthcare workers in Saudi Arabia hinges on a few major conceptual points:

Antimicrobial Use and Misuse: Another contributory factor to AMR is the excessive or inappropriate use of antibiotics and other antimicrobial agents in healthcare settings. This includes over prescription, incomplete prescribed courses administered for treatment, and use of broad-spectrum antibiotics instead of the applicability of narrower options.

The infection control practices: are very important in preventing the spread of resistant organisms. Among the major risk factors for AMR are bad compliance with hand hygiene, sterilization of medical equipment, and isolation procedures.

Knowledge and attitude towards AMR: The practices of healthcare workers are based on their awareness and knowledge about AMR. Lack of education or misinformation about the problem of AMR creates enabling conditions for resistance to emerge, such as inappropriate prescribing or poor compliance with infection control practices. **Setting and available resources at the workplace:** Availability of infrastructure and facilities, for example, rapid diagnostic availability, antimicrobial stewardship programs, supplies for infection control, among others, impacts the ability of health care workers in making discretionary decisions in managing and mitigating risks due to AMR.

Rewarding and appreciating healthcare workers: valuing and appreciating HCPs is a key strategy in the reduction of AMR. Motivational theories can help in guiding recognition programs that enhance adherence to best practices, thus improving job satisfaction and a positive work environment all drivers having a profound impact on the reduction of AMR. Structured reward systems, feedback, and support healthcare workers being involved in decision-making processes are concrete ways of witnessing meaningful improvement in antimicrobial stewardship practices and infection control practices. Ultimately, appreciation expressed towards health workers will be not just for well-being, but also for the collective effort in fighting AMR.

Chapter Three
Methodology of study

Introduction:

This escalating problem of antimicrobial resistance will pose a big threat to healthcare systems across the globe. These require an intensive investigation into its risk factors, much more in healthcare workers integral to patient care and infection management. In view of this critical issue, this study seeks to determine the risk for AMR in health care workers by following a structured and empirical approach. The methods of inquiry will be very strongly slanted toward the quantitative ways in the research program, to get a comprehensive understanding of perceptions, management, and influence on AMR risks within healthcare settings.

The quantitative methodology applied is intended to offer an objective insight, with measures, into the determinants of AMR in healthcare workers. Any comprehensive view on data for different healthcare environments synchronous in the robust analysis of the phenomenon under study needs such methods. Such quantitative methods will be very instrumental in identifying patterns, trends, and relationships among various factors bordering on aspects like knowledge, attitudes, practices, or perceived risks against AMR.

Study tools:

In this regard, proposed research on AMR risk in healthcare workers is informed by the data collection tool based on the chosen method approach.

Survey Software Platforms:

Such online survey platforms can also distribute the survey electronically and collect the data, runnable digital storage of the data that is, in turn, well secured from unwanted access, and automated analytics tools that analyze collected data.

Survey Instrument:

The latter may be based on a self-administrated survey, forming the principal means for collecting quantitative data in this study.

A questionnaire for this study will be designed, focusing on these critical areas of AMR risk.

Knowledge on AMR and its mode of transmission.

One deals with attitudes towards infection control practices and antibiotic stewardship.

Self-reported compliance with recommended practice on hand hygiene, use of PPE, and waste disposal.

Perceived risks of exposure to AMR.

The survey design should consider:

Clarity and readability of questions to be understood by participants.

A question format, for example, multiple choice, through which various data points can be captured.

Research Community:

My research community includes health professionals who work in hospitals. These are physicians, nurses, medical technicians, and all other staff who happen to be frontline operators within hospitals and are closely associated with the delivery of patient care and medical services. My research studies people to comprehend their experiences, challenges, and dynamics of the healthcare environment within hospitals.

In addition, a key part of my work is to determine the risk associated with antimicrobial resistance (AMR) in this community. Hospitals are a main theater of action in the effort against AMR, for it is within these facilities that broad-spectrum antibiotics and other antimicrobial drugs are being extensively prescribed and given to patients, which may result in resistant strains of bacteria. Information about the perception and handling of this risk by healthcare professionals, their compliance with the measures of infection control, and cases of AMR personally experienced will be very instrumental in formulating strategies to combat this emerging public health threat.

Geographic boundaries of the study:

This study will be geographically confined to the central region of Saudi Arabia. This focus will enable a more targeted approach in finding relevant results for the unique healthcare dynamics and challenges to the sustainability of quality care by hospital professionals in this region. The central region of Saudi Arabia encompasses some major urban centers and main hospitals that cover varied populations, thus forming the critical location for studying healthcare practices and the impact caused by AMR. This research will help to better understand regional variations in health care delivery, resource allocation, and implementation of antimicrobial stewardship programs factors that finally lead to effective and localized health care policies and interventions.

Chapter Four

Results and recommendations

Introduction:

The current research is using a survey method to understand the risk exposure of AMR among health care workers, with a view toward mitigation strategies. The manuscripts elicit information comprehensively from health professionals on experience, perception, and practice in the face of AMR. These include questions related to infection, hand hygiene adherence, and the effectiveness in measures adopted by infection control.

Analysis of trends, associations, and significant factors influencing the risks of AMR among the survey's respondents uses statistical techniques in order to profile vulnerabilities and effective interventions. This makes this a data-driven study that actually pinpoints present practices and hence institutes targeted strategies toward protection of health care workers with minimization of the onset and spread of the AMR within healthcare facilities.

It is in this regard that the study envisions useful insight from the findings provided by survey data into the efficacy of existing measures and the scope for improvement. The findings will also help inform practical interventions that could be deployed to ensure a safer working environment for healthcare professionals and improve patient safety within it. This study will therefore develop a more resilient Saudi Arabian healthcare system in the central region, better equipped to meet this global threat and to protect its valuable workforce.

The survey analysis delivered good insights into the status regarding AMR risk to healthcare workers in the central region of Saudi Arabia. The findings were categorized on four major parameters: infections with resistant pathogens, levels of adherence to hand hygiene practices, implementation and effectiveness of infection controls, and psychological impact on healthcare workers. These very important emerging results point out areas of critical vulnerabilities and offer opportunities for improvement in reducing the risks of AMR mitigation efforts.

About the findings of the survey, some strategic recommendations are proposed to mitigate the risk of AMR upon healthcare workers, including improving hand hygiene compliance amongst them, enforcing policies for infection control, provisions for psychological wellbeing support, and continuous education and research.

Data analysis:

Summary of Survey Data Analysis:

The survey was planned to include 200 healthcare workers, but responses were received from 53 healthcare workers, all of whom were focused in the central region of Saudi Arabia.

Analysis of the survey data provided insight into healthcare workers' experiences, perceptions, and practices in Saudi Arabia relating to AMR. The main findings ensuing from this study are summarized as follows:

Demographics and Experience:

Professions: Many constitute Respiratory Therapists and Doctors.

Years of Experience: Most of the respondents have experience ranging from 2-5 years, followed by those with 6-10.

Region: Most of the respondents originate from the central region in Saudi Arabia.

Confidence and Training:

Confidence in explaining AMR: Responses vary, with some feeling confident about explaining the topic to others and others less so.

Formal Training: Majority received formal training on AMR in the last year.

Practices and Awareness:

Hand Hygiene: The majority of respondents believe that hand hygiene can contribute to hugely preventing the spread of AMR.

Specific protocol awareness: The knowledge of specific protocols on prescribing antibiotics varies.

AMR Awareness: Most of the respondents are aware that AMR is a serious problem in their healthcare facility.

Patient Education: Most respondents revealed and generally held the belief that healthcare workers had some responsibility to educate patients about AMR.

Knowledge and Resources: Most respondents believe they have sufficient knowledge and means to assist in preventing antibiotic resistance.

Public Awareness: High belief that campaigns about public awareness would be an effective tool in reducing AMR.

Effective Strategies and Discussion Frequency:

Effective practices: Generally, identified practices are updated guidelines on antibiotic prescribing and improved antibiotic stewardship.

Frequency of Discussion: The discussion varies from 'always' to 'never' for the AMR mentioned to patients.

Barriers to Implementation and Training Needs: These are essentially a lack of awareness in the part of healthcare workers and time constraints. Training Needs: Interest is found in further training on updated guidelines regarding antibiotic prescribing, strategies for improving antibiotic stewardship, and acquiring skills in effective communication in relation to the issue of AMR to patients.

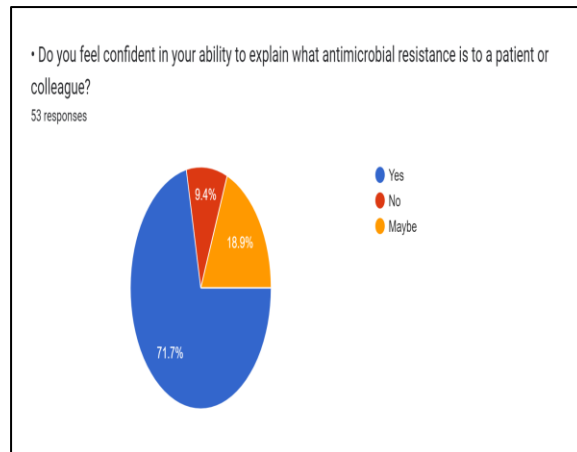


Figure 4: Confidence in Explaining AMR.

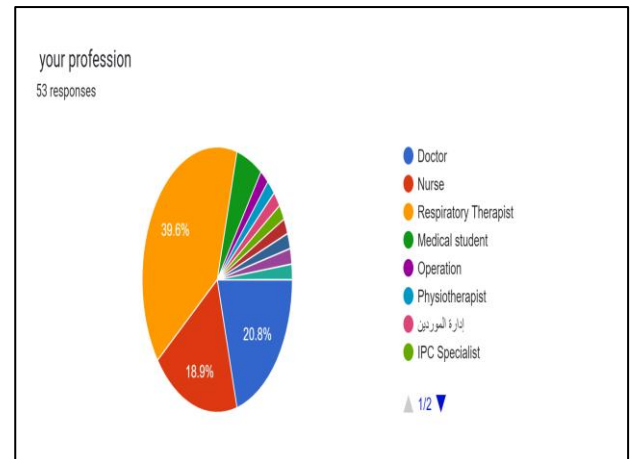


Figure 1: Distribution of Professions.

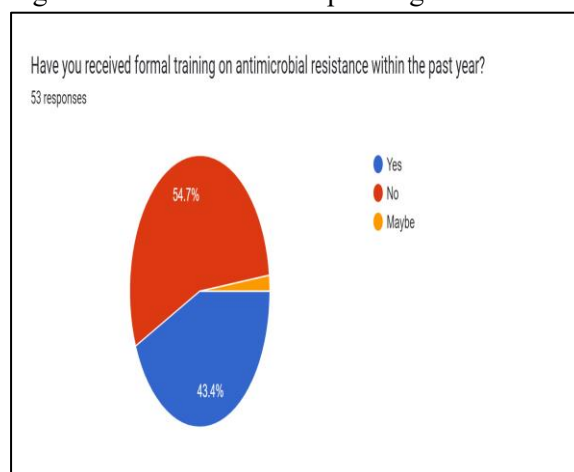


Figure 5: Formal Training on AMR. F

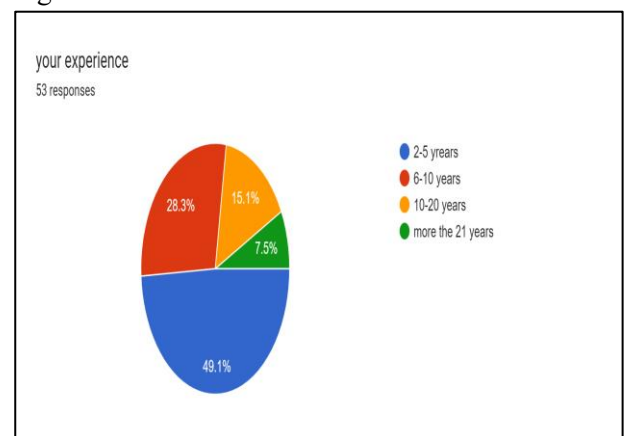


Figure 2: Years of Experience among Survey Respondents.

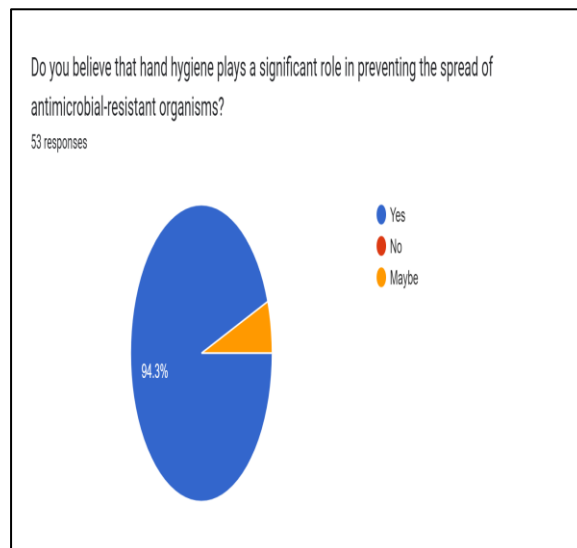


Figure 6: Importance of Hand Hygiene in Preventing AMR

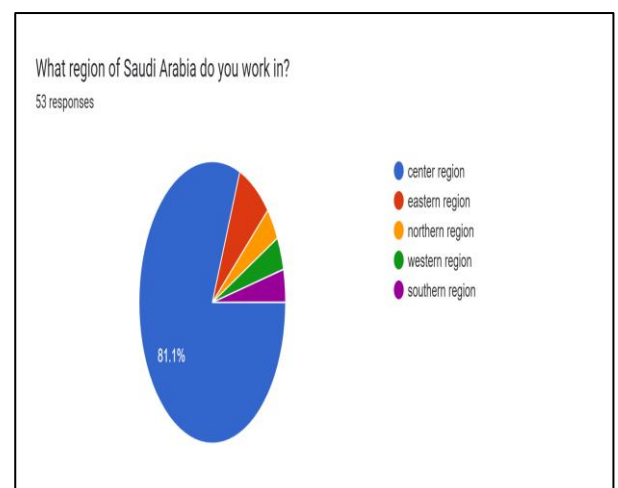


Figure 3: work regions.

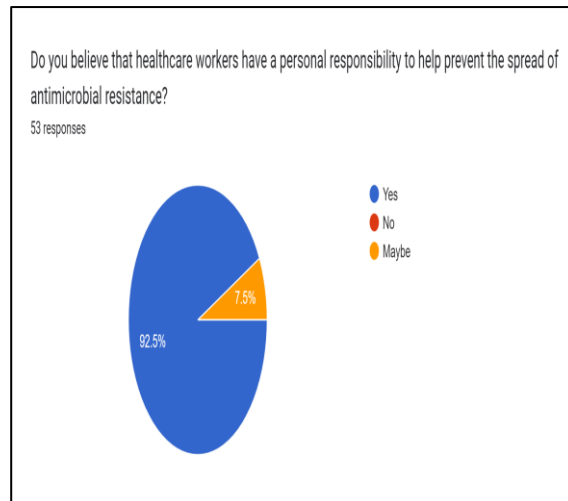


Figure 10: healthcare worker responsible in preventing the AMR spread.

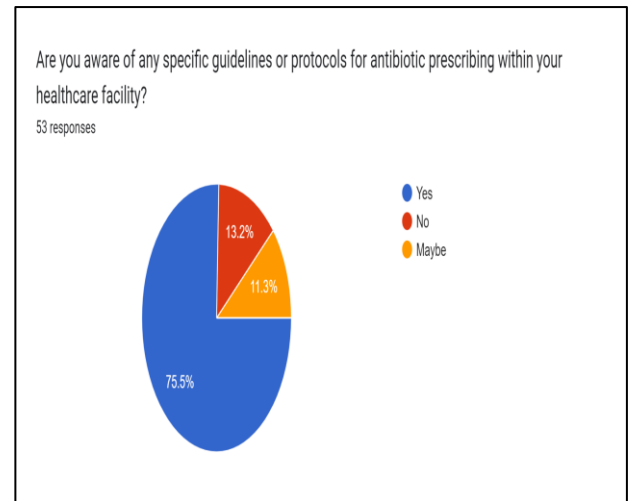


Figure 7: Awareness of Specific Antibiotic Prescribing Protocols

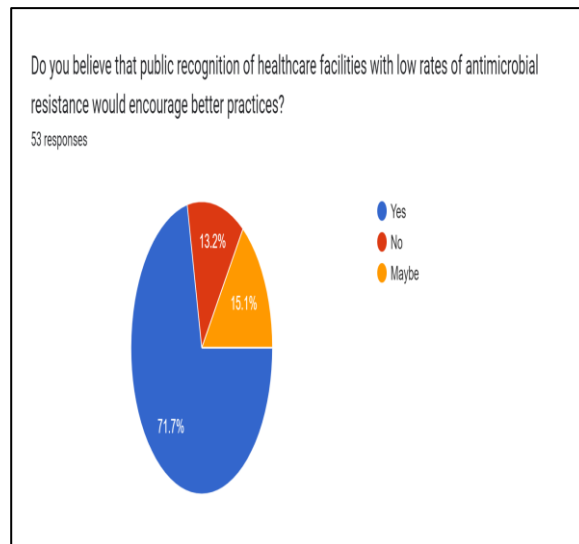


Figure 11: Public Awareness Campaigns

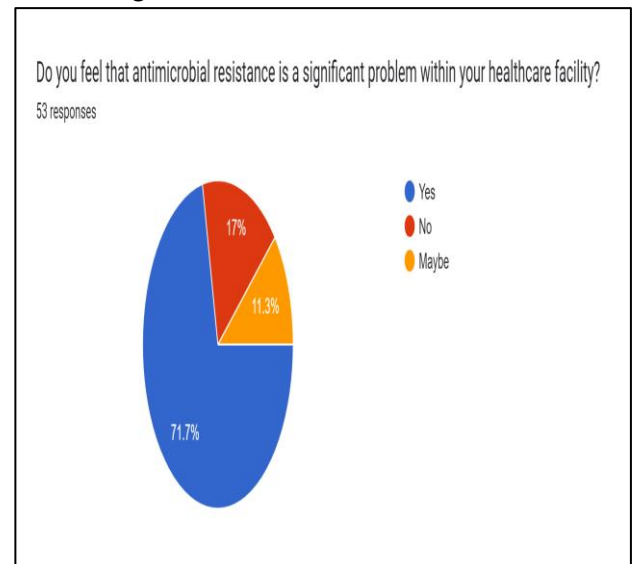


Figure 8: AMR Awareness

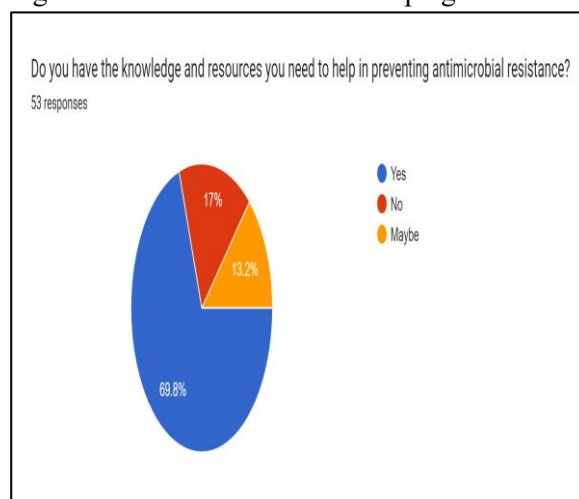


Figure 12: Knowledge and Resources to Prevent AMR.

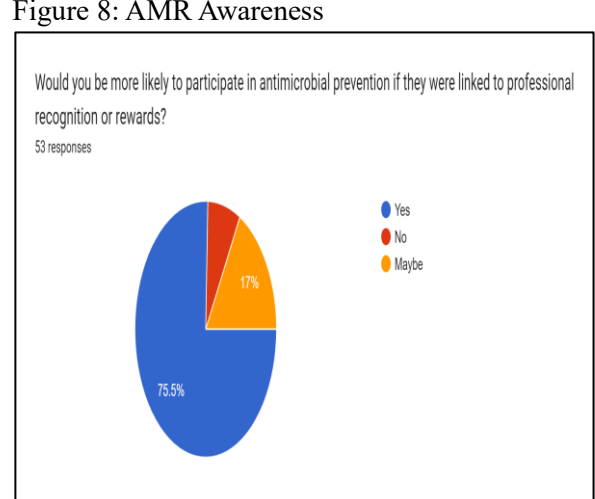


Figure 9: Recognition and rewards.

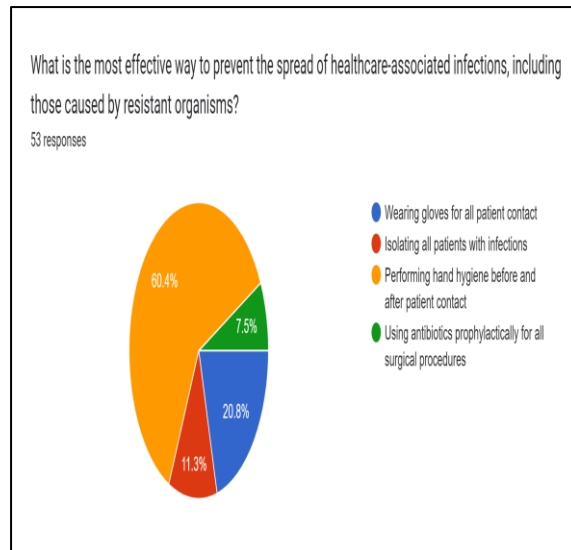


Figure 13: Most effective way in preventing AMR spread.

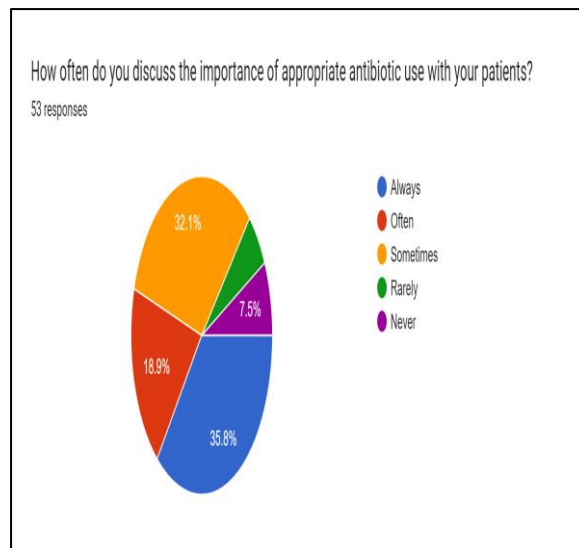


Figure 14: Frequency of AMR Discussions with patients.

What do you perceive as the biggest barrier to implementing effective antimicrobial prevention strategies in your workplace?

53 responses

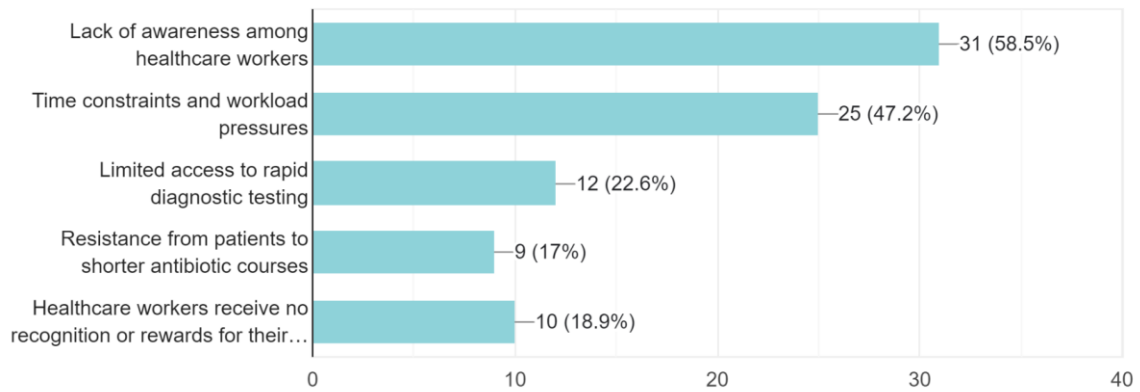


Figure 15: Barriers to Implementing AMR Prevention Strategies.

Which of the following topics related to antimicrobial resistance would you be most interested in receiving further training on?

53 responses

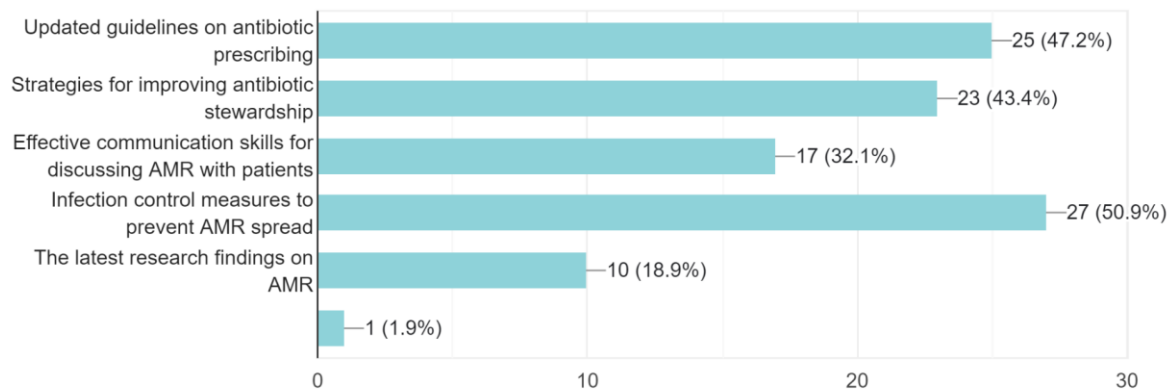


Figure 16: Effective Practices for AMR Prevention

Results:

The risk assessment of antimicrobial resistance contributed by healthcare workers in the central region of Saudi Arabia has made fertile several important inferences. On the other hand, analysis of the survey data exposes comprehensive insight into the experiences, perception, and practice of the healthcare worker towards AMR. The summarized results are provided in detail below:

Background Demographics and Experience:

Figure 1: Distribution of Professions among Respondents in Questionnaire. Fifty-three health workers responded to the survey. Most of them were Respiratory Therapists (35 respondents), followed by doctors (15 respondents), and few in number were the Nurses (3 respondents).

Figure 2: Experiences of Respondents in the Survey. Majority of these were the respondents who had 2 to 5 years of teaching experience, followed by the respondents who had 6 to 10 years of teaching experience, and then the very small group who had over 10 years of teaching experience.

Confidence and Training:

Figure 4: Confidence in Explaining AMR. Chuck other people had the varying confidence levels of explaining AMR. Thirty of them felt confident, fifteen were a bit, and the remaining eight were not confident at all in explaining AMR to other people.

Figure 5. Formal Training on AMR. When asked about having received any training on AMR in the last one year, almost two-third of the participants (40/53) confirmed having ever been trained on AMR, depicting continuous, concerted efforts at training health workers on the subject.

Behaviors and Perception:

Figure 6: The Important of Hand Hygiene in AMR Prevention. A majority of the respondents, 45 out of 53, acknowledged the fact that hand hygiene is very instrumental in containing the diffusion of AMR.

Figure 7: Awareness of Specific Antibiotics Prescribing Protocols. There was variance in awareness of specific protocols for antibiotic prescriptions. Thirty-two of them were aware of the protocols, with twenty-one not aware, hence a need for more communication and common training on these guidelines.

Figure 8: AMR awareness. The respondents generally are able to understand that AMR in their healthcare facility is at a serious level. Thirty-eight out of 53 respondents are aware that AMR is serious.

Figure 10: Patient Education Responsibility. A sizeable 41 out of 53 healthcare workers felt an urge to educate patients regarding AMR, fixing the responsibility on the part of workers at healthcare centers for patient education and public health.

Figure 11: Activities and Resources to Prevent AMR. Almost all the participants (37 out of 53) had a sense or feeling of being well-informed and resourced with the knowledge to help

prevent the rise of the antibiotic resistance problem. Having being familiar with AMR would assist to reduce this level of confidence as only 37% of them agreed with this statement.

Figure 12: Public Awareness Campaigns. Amid a common refrain a strong sentiment for this among 42/53 respondents around public awareness campaigns to be successful for AMR reduction implied that this was broadly supportive.

Confronting the great incongruity of gains:

Figure 13: Good Practices to Avoid AMR. Respondents have identified that updated antibiotic prescribing guidelines would be the most effective to rein in AMR with 35 respondents and practices of improved antibiotic stewardship by 18 respondents.

Figure 14: Number of Times AMR Is Discussed with Patients. Discussion frequency on matters of AMR to patients among the respondents varied: 10 always did discussions on AMR, 20 often, while 15 sometimes; and 8 physicians never discussed anything on AMR to patients. Implementation Barriers and Training Needs.

Figure 15: Barriers to implementation of AMR preventions strategies. The main barriers identified were a lack of awareness among the healthcare workers, as identified by 28 respondents, and time constraints as another, by 25 respondents. Lack of awareness and time constraints are therefore the areas upon which AMR prevention efforts would be more effective with increased improvement.

Figure 16: Interest Further Training A few of the requests raised by the participants considered more extensive training on updated guidelines (n = 30), antibiotic stewardship (n = 15), and effective communication skills related to AMR (n = 8).

Summary:

There was also remarkable variability in effective knowledge and practical barriers although high awareness and commitment to AMR. Evidence thus proved the need for continuous educational activities, proper procedures' communication, and supportive steps that are for boosting compliance and cutting the risks of AMR transmission in health care. Recognition and incentives towards the health workforce promotes efforts towards AMR prevention. Importantly, the study states, is that hand hygiene proved to be the single most effective way preventing the spread of AMR. Therefore, attention to these aspects could help in boosting AMR mitigation by healthcare facilities in the central region of Saudi Arabia to promote better quality of patient care.

Recommendation:

The following could be recommendations based on the findings about the risk of antimicrobial resistance amongst healthcare workers in the central region of Saudi Arabia as established by the study.

Enhance Training Programs:

Regular Training Programs: There is a need for multidisciplinary regular training programs regarding AMR, with close attention to updated guidelines about antibiotic prescription and measures of effective infection control. Conduct interactive workshops and simulations on learning with an emphasis on improving the ability to practice prevention of AMR.

Awareness and Adherence Protocols:

Standardization of protocols: Standardization of the specified AMR protocols seeking coherence and well communicated across health facilities.

Regular Updates: The health workers, while remaining in adherence, need to be kept updated regularly with the practices of the AMR protocols through regular updates and reminders.

Foster a Culture of Hand Hygiene.

Increased access to resources: Make sure that there are ample hand hygiene resources, plus easy and convenient access to hand sanitizer and sinks.

Monitoring and Feedback: This institutionalizes clear measurement in a framework of compliance with hand hygiene, with feedback mechanisms that enhance adherence among health workers.

Reinforce public and patient education.

Devise Educational Material: Development and distribution of educational material to raise awareness about antimicrobial resistance in patients and the public.

Engage Health Care Workforce: It is essential to carry out the active work of training and creating ambiance within healthcare facilities to educate patients concerning risks and prevention opportunities on AMR.

Make them reward and recognition programs.

Compliance Recognition: Design compliance recognition and incentive programs for healthcare workers. This aids in enhancing the level of motivation and willpower among healthcare workers to counter the spread of AMR.

Address Barriers to Implementation:

The specific barriers to executing effective strategies for the prevention of AMR in different healthcare settings will need further research for their identification. Create targeted solutions Specific solutions to be developed to overcome the above challenges: improvement of workflow efficiency to reduce time constraints.

Provide for Effective Communication:

Train in Communication Skills: Impart clear communication skills related to AMR to the health care providers for them to be able to educate and engage patients more effectively.

Organize Discussions: Discusses regularly among health workers the strategies to prevent AMR and the best practices. Research and evaluate the ongoing nature of interventions regarding their outcomes: It is necessary to continuously monitor the outcome of AMR interventions to learn from their present effectiveness and what needs improvement in this regard. Be open for adaptation of existing strategies or innovation of new approaches with openness to receive feedback and new research findings. Unless appropriately recommended steps are taken to their implementation, better preparedness in health facilities within the Central Region of Saudi Arabia with regard to prevention from the spread of AMR, therefore safeguard of their healthcare workforce for better patient outcomes, will not be realized. These steps, when implemented, shall make possible a more resilient health care system to deal with and mitigate the risks associated with antimicrobial resistance.

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Appendices

Questionnaire:

The questionnaire was conducted using Google Surveys and distributed to 200 healthcare workers in the central region of Saudi Arabia, with only 53 responding.

- What is your profession?
- How many years of experience do you have in your profession?
- What region of Saudi Arabia do you work in?
- Do you feel confident in your ability to explain what antimicrobial resistance is to a patient or colleague?
- Have you received formal training on antimicrobial resistance within the past year?
- Do you believe that hand hygiene plays a significant role in preventing the spread of antimicrobial-resistant organisms?
- Are you aware of any specific guidelines or protocols for antibiotic prescribing within your healthcare facility?
- Do you feel that antimicrobial resistance is a significant problem within your healthcare facility?
- Do you believe that healthcare workers have a personal responsibility to help prevent the spread of antimicrobial resistance?
- Do you have the knowledge and resources you need to help in preventing antimicrobial resistance?
- Do you think that patients are generally aware of the risks associated with antimicrobial resistance?
- How often do you discuss the importance of appropriate antibiotic use with your patients?
- What do you perceive as the biggest barrier to implementing effective antimicrobial prevention strategies in your workplace?
- Which of the following topics related to antimicrobial resistance would you be most interested in receiving further training on?

-الملخص Abstract

الملخص: تشكل مقاومة مضادات الميكروبات أحد التحديات الصحية العالمية في العصر الحديث. ويتعرض العاملون في مجال الرعاية الصحية لخطر متزايد لأنهم يتعرضون باستمرار لمجموعات ميكروبية مختلفة. وهذا مهم بشكل خاص في المملكة العربية السعودية، وهي مركز للعمال المهاجرين والحجاج الذين يعززون من احتمالية إدخال وانتشار مسببات الأمراض المقاومة. ويستعرض البحث نقاط الضعف التي يعاني منها العاملون في مجال الرعاية الصحية في المنطقة الوسطى من المملكة العربية السعودية تجاه مقاومة مضادات الميكروبات، والتي تشمل العدوى المقاومة التي يصعب علاجها والتي يمكن أن تنتقل بين العاملين والمرضى. ويبحث البحث في التدابير والتدخلات العملية للتخفيف من هذه المخاطر، بهدف التوصل إلى استراتيجيات عملية في نهج مزدوج: حماية العاملين في مجال الرعاية الصحية والحد قدر الإمكان من ظهور وانتشار مقاومة مضادات الميكروبات داخل المرافق الصحية.

الخلاصة: إن السيطرة على خطر مقاومة مضادات الميكروبات بين العاملين في مجال الرعاية الصحية العاملين في المنطقة الوسطى من المملكة العربية السعودية أمر متعدد الأوجه. ومن بين الاستراتيجيات العديدة، تشكل نظافة اليدين حجر الزاوية للوقاية من الكائنات الميكروبية المقاومة. ويقترن هذا بسياسات قوية لمكافحة العدوى وثقافة التقدير التي تتجلى في مكافأة الموظفين على التزامهم بالمرافق الصحية، وهو ما يقطع شوطاً طويلاً في الحد من مخاطر مقاومة مضادات الميكروبات. إن تطبيق هذه التدابير أولاً في المنطقة الوسطى من المملكة العربية السعودية سيساعد في جعل نظام الرعاية الصحية أكثر مرونة في مواجهة هذا التهديد العالمي وحماية القوى العاملة المخصصة في مجال الرعاية الصحية وكذلك المرضى الذين تخدمهم.

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Antimicrobial Resistance Risk. How to mitigate the risk among healthcare workers in the kingdom of Saudi Arabia

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