Electronic Prescribing System and electronic health record priorities for antimicrobial stewardship

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ABSTRACT

Rationale, aims, and objectives: This study provided a platform for electronic prescribing design features that may facilitate antimicrobial stewardship. This study aimed to identify software features within electronic prescribing systems and to assign priorities to these software features according to the opinions of the infection specialist health care professionals. Also, to identify any differences in priorities according to a professional group and experience in using electronic prescribing and communicate research findings to policy-makers and electronic prescribing manufacturers.

Methods: The study was conducted in a large (600-bed) governmental tertiary and teaching hospital in Amman, Jordan. The survey was delivered by hand to antimicrobial prescribers (internists, surgeons, paediatricians, infectious diseases specialists, and critical care specialists) and non-prescribers (medical interns, clinical pharmacists, nurses, and other allied health care professionals) who filled out the survey face to face. The delivery of the survey started on March 15, 2020, and was closed on April 7, 2020.

Results: Responses were received from 210 individuals. Interns represented more than one-third of respondents (n= 79, 37.6%), with 15.7% were internal medicine physicians. Among the healthcare professionals, around 44.7% (n= 94) are considered prescribers to antimicrobials, while others are considered non-prescribers (n= 116, 55.2%). The majority of respondents (n= 205, 97.6%) reported using an electronic prescribing and electronic health record system for part or all in their hospital, with 35.7% (n= 75) of them reported using these systems for more than one year. The prompt prescribing feature having the highest assigned priority was the allergy checker (n= 193, 91.9%) followed by the dose checker (n= 192, 91.4%).

Conclusion: This study demonstrates the first attempt to describe views of healthcare professionals in Jordan about the potential significance of prescribing prompt and active prescription surveillance software features on clinical, microbiological and process outcomes to support antimicrobial stewardship. Findings from this study reveal considerable demand for additional software features expressed by the healthcare professionals charged with promoting rational use of antimicrobials and a consensus of anticipated positive impact on patient safety and efficiency outcomes.

Keywords: antimicrobial stewardship, electronic prescribing, electronic health record, antimicrobial resistance, hospital software design features

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1. INTRODUCTION

The loss of effectiveness of any anti-infective medicine is referred to as antimicrobial resistance (AMR) (1). AMR is considered one of the major global health problems with a negative economic and human impact (i.e., mortality and morbidity) (2,3). Since 2002, the World Health Organisation (WHO) has developed a global strategy to reduce the problem of AMR (4). The WHO recently released a practical toolkit about the Antimicrobial Stewardship (AMS) programs in healthcare facilities in low and middle-income countries to optimise the use of antibiotics and contain AMR (5). Also, the 2013 United Kingdom (UK) Five Year AMR Strategy from the Department of Health shed light on AMS as one of seven critical areas for action. The National Health Service England has then included antimicrobial prescribing reduction goals for English hospitals (6). In Jordan, the Jordanian minister of health reflected on infections and the rise in AMR (7) and called for an action plan aligned with the WHO global action plan to preserve the effectiveness of existing antibiotics through antimicrobial stewardship (8). As a result, a four years national action plan was developed to combat AMR in 2018. The action plan highlights AMS as one of the critical areas of action. Furthermore, it sheds light on the importance of information technology in electronic prescribing as a key area of antimicrobial stewardship (8). Also, the government in Jordan is committed to implementing the 2018 four years of the national action plan through its health system and using multi-sectoral as well as one health approach (8). Electronic prescribing systems in hospitals present a unique opportunity to improve the quality of antimicrobial prescribing and facilitate antimicrobial stewardship (9–14). Antimicrobial stewardship is a coordinated program that promotes the appropriate use of antimicrobials (including antibiotics) (7,15), improves patient outcomes, reduces microbial resistance, and decreases the spread of infections caused by multidrug-resistant organisms (9–14).

Evidence for the benefits of AMS functionality within electronic prescribing systems comes from published research studies demonstrating a positive impact on outcomes (16–18), including increased guideline adherence (19–21), adequacy of antibiotic coverage (22), reductions in antimicrobial prescribing (23,24), resistance (25–28), dosing errors (12), length of hospital or ICU stay (23,29), and mortality (20,22,30). However, many of these information systems were created on a small number of individual hospitals or groups of institutions. As a result, few reports cover the full potential range of software features that enable antimicrobial stewardship (31,32). Moreover, there does not appear to be a recognised standard to guide the specification and commissioning of an optimal electronic prescribing system that includes the required AMS functionality appropriate for the challenges that health systems currently face worldwide (33,34).

This study aimed to identify software features within electronic prescribing systems in Jordan University Hospital (JUH) that could potentially facilitate antimicrobial stewardship. Also, to assign priorities to these software features according to the opinions of the infection specialist health care professionals. And finally, to identify any differences in priorities according to professional group and experience in using electronic prescribing and communicate research findings to policy-makers and electronic prescribing manufacturers. This study was intended to improve the existing system and make it matches the desired AMS intervention.

2. Methods

3.1 Ethics approval

Ethical approval was obtained from the University of Jordan Hospital Standing Committee in Research and given an approval number (80/2019/23) (Appendix 1). Also, ethical approval was obtained from Zarqa University Ethics Committee for Scientific Research and given an approval number (3/3/2018-2019) (Appendix 2).

3.2 Hospital case site and antimicrobial stewardship

The JUH is a tertiary referral and teaching hospital (A large 600-bed) located in Amman, Jordan. Since 2001, the infectious diseases department has been developing and implementing AMS strategies that curtailed broad-spectrum antimicrobials use within the hospital. The electronic prescribing system at the University of Jordan hospital is a system that needs to be upgraded to meet the goals of antimicrobial stewardship. The electronic prescribing system at the hospital has a clinical decision support function in the form of order sets and automatic soft stop of antimicrobials

3.3 Survey development and data collection

In light of the previously developed questionnaire (31), a pool of 42 items was initially drafted. The draft was reviewed by an infectious diseases consultant, a clinical pharmacist, and academic researchers familiar with survey design. The initial draft containing 42 items was considered lengthy by most reviewers; besides, suggestions were made related to the items' structure. As a result of this review, nine items were removed as perceive less applicable to the Jordanian healthcare system by reviewers. In addition, the reviewers commented on wording, clarity, comprehensiveness, and whether each item of the survey was relevant to the study aims and objectives. The reviewers' comments were used to develop the final version of the survey. The final version of the survey included 33 questions which were divided into three domains. The final version first domain collected respondent demographic data, including speciality, experience in a specialist role, hospital setting and electronic prescribing experience. In the remaining two domains, respondents were asked to assign priority to individual software features grouped according to the categories of prescribing alerts/prompts (12 features), active prescription surveillance (11 features) and prescribing trend surveillance (8 features). At the end of each domain, respondents were asked to express their opinion of the anticipated collective impact of the software features from each domain on several clinical, microbiological and process outcomes. The survey was piloted in the local region, especially with one clinical pharmacist and infectious diseases consultant in October 2019.

Participants willing to participate were provided with study ethics committee approvals (Appendix 1 and 2), and the study survey t ool which required 10-15 minutes to fill. The survey was delivered by hand to antimicrobial prescribers (internists, surgeons, paediatricians, infectious diseases specialists, and critical care specialists) and non-prescribers (medical interns, clinical pharmacists, nurses, and other allied health care professionals) at the University of Jordan Hospital who filled out the survey face to face. Participants were informed that participation is voluntary and that the participants can withdraw at any stage, with their answers treated confidentially. The delivery of the survey lasted three weeks, started March 15, 2020, and was closed on April 7, 2020.

3.4 Statistical analysis

Data were entered and analysed using Statistical Package for the Social Sciences (SPSS) version 22 (SPSS Inc., Chicago, IL, USA). The descriptive analysis was done using the median and Interquartile Range (IQR) for continuous variables and percentages for categorical variables. Checking for normality was carried out using the Shapiro-Wilk test, with a P-value > 0.05 indicating normally distributed continuous variables.

According to the Shapiro-Wilk test, priority scores were found to be not normally distributed. Therefore, Mann-Whitney U test analysis was conducted to assess the differences in prescribing prompts and active prescription surveillance software feature priority scores between respondents. A p-value of less than 0.05 was considered significant.

Results

During the study period, 210 healthcare professionals responded (210 out of 450, response rate; 47%), interns

represented more than one-third of respondents (n= 79, 37.6%), with 15.7% were internal medicine physicians. Among healthcare professionals, around 44.7% (n= 94) were considered prescribers to antimicrobial (infectious disease, internal medicine, paediatrics, surgery and critical care physicians), while others were considered non-prescribers (n= 116, 55.2%). Around two-thirds of the participants had less than one year of experience using and applying AMS interventions (n= 130, 61.9%).

The majority of respondents (n= 205, 97.6%) reported using an electronic prescribing and electronic health record system, with 35.7% (n= 75) of them reported using these systems for more than one year. For more details of the demographic characteristics of respondents, refer to **Table 1**.

Table 1. Demographic characteristics of respondents and their experience with the electronic prescribing and electronic health record system (n= 210)

Variable	n(%)
Professional group	
o Infectious diseases physician	3 (1.4)
o Internal medicine physician	33 (15.7)
o Pediatric physician	29 (13.8)
o Surgery physician	25 (11.9)
o Critical care physician	4 (1.9)
o Clinical pharmacists	27 (12.9)
o Nurse	2 (1.0)
o Interns	79 (37.6)
o Others	8 (3.8)
Experience in using and applying antimicrobial stewardship interventions	
o < 1 year	130 (61.9)
o ≥1 year	80 (38.1)
Does your hospital currently use an electronic prescribing and electronic health record system for SOME or ALL wards?	
o Yes	205 (97.6)
o No	5 (2.4)
How long have you been using electronic prescribing and electronic health record?	
o < 1 year	135 (64.3)
o ≥ 1 year	75 (35.7)

Table 2 presents respondents-assigned priority to 12 prescribing prompt software features within the electronic prescribing and electronic health record. Except for restricted antimicrobial block and restricted antimicrobial authorisation, all other prescribing prompt features were reported to be of high priority or essential by most respondents (>70%). The prompt prescribing feature that was reported to have the highest assigned priority was allergy checker (n= 193, 91.9%) followed by children dose checker (n= 192, 91.4%).

Table 2. Prescribing prompt software features ranked in order of respondent-assigned priority (n= 210)

Software feature	Assigned priority				
	Not a priority	Low	Medium	High	Essential
Treatment protocol/order sets	4 (1.9)	16 (7.6)	33 (15.7)	76 (36.2)	81 (38.6)
Allergy checker	0 (0)	3 (1.4)	14 (6.7)	42 (20.0)	151 (71.9)
Interaction checker	2 (1.0)	5 (2.4)	14 (6.7)	79 (37.6)	110 (52.4)
Dose checker (adult)	1 (0.5)	1 (0.5)	31 (14.8)	71 (33.8)	106 (50.5)
Dose checker (Children)	0 (0)	2 (1.0)	16 (7.6)	72 (34.3)	120 (57.1)
Critical antimicrobial alert	0 (0)	12 (5.7)	51 (24.3)	81 (38.3)	66 (31.4)
Restricted antimicrobial block	7 (3.3)	20 (9.5)	58 (27.6)	64 (30.5)	61 (29.0)
Restricted antimicrobial authorisation	0 (0)	14 (6.7)	66 (31.4)	90 (42.9)	40 (19.0)
Soft stop	0 (0)	5 (2.4)	47 (22.4)	85 (40.5)	73 (34.8)
Indication prompt	3 (1.4)	16 (7.6)	38 (18.1)	92 (43.8)	61 (29.0)
Blood level monitoring alert	0 (0)	12 (5.7)	19 (9.0)	73 (34.8)	106 (50.5)
Blood level monitoring protocol/order set	2 (1.0)	14 (6.7)	36 (17.1)	89 (42.4)	69 (32.9)

Regarding the importance and likely impact of prescribing prompt software features on clinical, microbiological and process outcomes (**Figure 1**), the majority of respondents believed that improving safety (n= 118, 56.2%) and reducing AMR (n= 109, 51.9%) were highly likely to occur as a consequence of the presence of prescribing prompt software features.

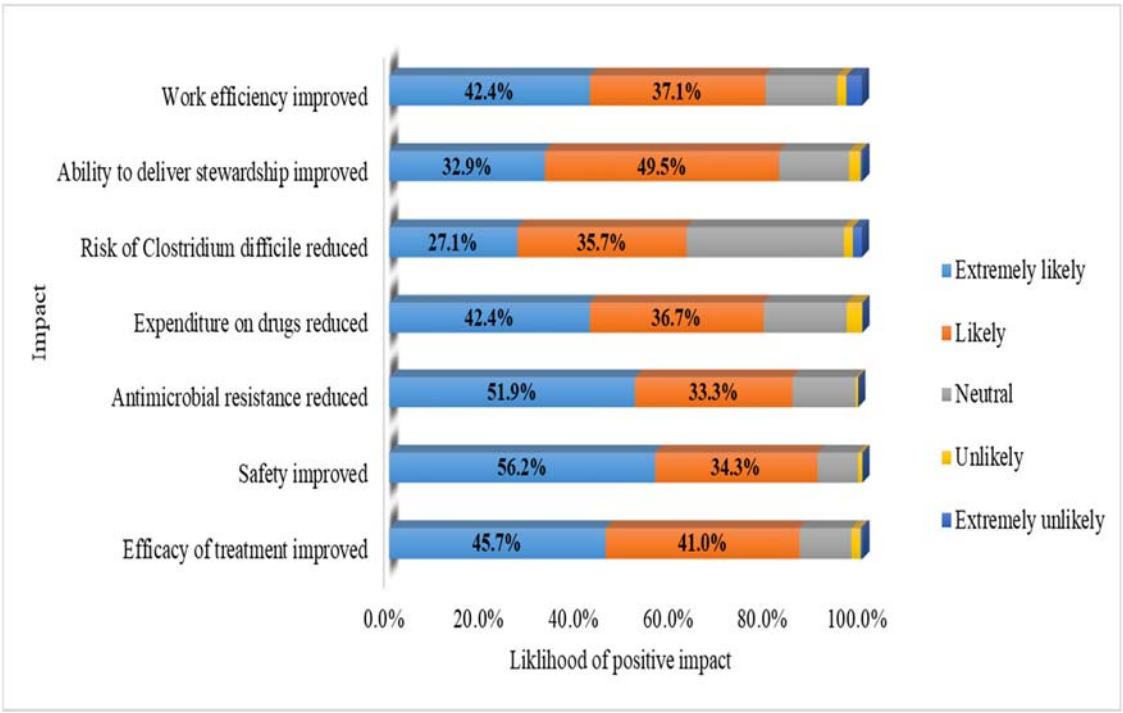

Figure 1. Respondents' opinions of the likely impact of prescribing prompt software features on clinical, microbiological and process outcomes (n= 210)

Regarding active prescription surveillance software features, pharmacists were asked to assign their perceived priorities (**Table 3**). Only five features out of the 11 features were considered an essential or high priority by the majority (>70%) of respondents, which include (daily reports of drug interaction mismatch, a daily report of prescriptions for sepsis of undetermined origin, a daily report of the missed dose, a daily report of long intravenous course length and daily report of high-dose aminoglycoside prescription).

Table 3. Active prescription surveillance software features ranked in order of respondent-assigned priority (n= 210)

Software feature	Assigned priority				
	Not a priority	Low	Medium	High	Essential
A daily report of NEW prescriptions of CRITICAL antimicrobials	4 (1.9)	30 (14.3)	52 (24.8)	77 (36.7)	47 (22.4)
A daily report of NEW prescriptions of ALL antimicrobials	6 (2.9)	40 (19.0)	69 (32.9)	67(31.9)	28 (13.3)
A daily report of ONGOING prescriptions of CRITICAL antimicrobials	6 (2.9)	12 (5.7)	68 (32.4)	83 (39.5)	41 (19.5)
A daily report of ONGOING prescriptions of ALL antimicrobials	8 (3.8)	37 (17.6)	78 (37.1)	63 (30.0)	24 (11.4)
A daily report of DRUG-INDICATION MISMATCH	4 (1.9)	10 (4.8)	32 (15.2)	84 (40.0)	80 (38.1)
A daily report of prescriptions for SEPSIS OF UNDETERMINED ORIGIN	5 (2.4)	9 (4.3)	48 (22.9)	81 (38.3)	67 (31.9)
A daily report of prescriptions for DIAGNOSIS OF INTEREST	7 (3.3)	15 (7.1)	66 (31.4)	74 (35.2)	48 (22.9)
A daily report of MISSED DOSES	3 (1.4)	8 (3.8)	40 (19.0)	66 (31.4)	93 (44.3)
A daily report of LONG INTRAVENOUS COURSE LENGTH	2 (1.0)	18 (8.6)	42 (20.0)	86(41.0)	62 (29.5)
A daily report of LONG TOTAL COURSE LENGTH	1 (0.5)	19 (9.0)	59 (28.1)	71 (33.8)	60 (28.6)
Daily report of HIGH-DOSE AMINOGLYCOSIDE prescriptions	2 (1.0)	11 (5.2)	38 (18.1)	95 (45.2)	64 (30.5)

A daily report of ongoing prescriptions of all antimicrobials was considered the feature of lowest priority as determined by study respondents as only 41.4% (n= 87) of respondents considered it to be essential or of high priority.

Regarding respondents' opinions of the likely impact of active prescription surveillance software features on clinical, microbiological and process outcomes (**Figure 2**); again, the majority of respondents believed that improving safety (n= 105, 50.0%) and reducing AMR (n= 96, 45.7%) are extremely likely to occur as a consequence of the presence of active prescription surveillance software features.

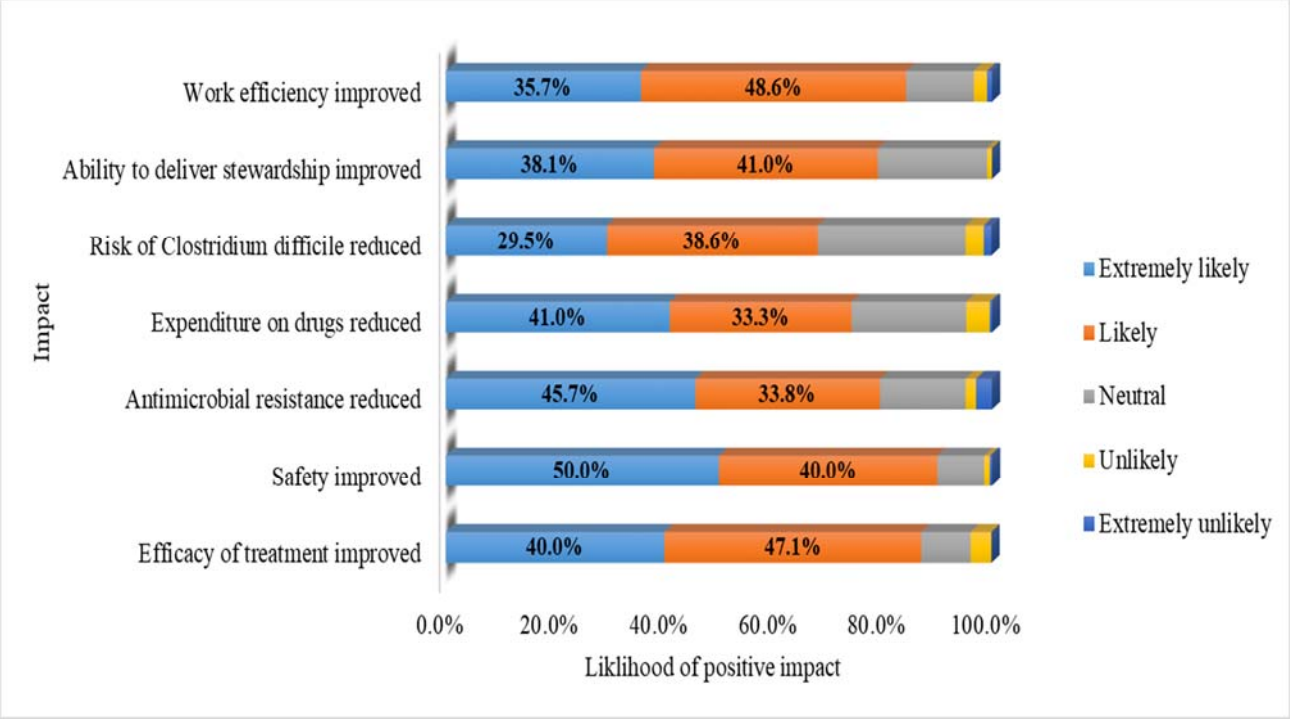

Figure 2. Respondents' opinions of the likely impact of active prescription surveillance software feature on clinical, microbiological and process outcomes (n= 210)

Finally, we evaluated the differences in the priority score for both (the prescribing prompts features and active prescription surveillance features) between the respondents (**Table 4**). Non-prescribers showed higher priority scores for the active prescription surveillance features compared to prescribers (p-value = 0.023). Also, those respondents with less than one year of experience in using and applying AMS interventions showed higher priority scores for the active prescription surveillance features compared to those with higher experience (p-value =0.018).

Table 4. Differences in prescribing prompts and active prescription surveillance software feature priority scores between respondent (n= 210)

Groups	Prescribing prompts priority score		Active prescription surveillance priority score	
	Median (IQR)	P-value#	Median (IQR)	P-value#
Profession$				
o Prescribers	79.2 (18.8)	0.189	63.6 (25.6)	0.023*
o Non-prescribers	77.1 (18.7)		75.0 (15.3)	
Experience in AMS				
o < 1 year	79.2 (19.3)	0.889	75.0 (18.8)	0.018*
o ≥ 1 year	79.2 (18.7)		68.2 (27.3)	
Duration in using an electronic prescribing system				
o < 1 year	77.1 (18.7)	0.315	72.7 (15.9)	0.514
o > 1 year	81.3 (18.8)		70.5 (27.3)	

AMS: Antimicrobial stewardship, $Prescribers are all physicians included in the study, including infectious diseases physicians, internal medicine physicians, pediatric physicians, surgery physicians, and critical care physicians, while non-prescribers (i.e., medical interns, clinical pharmacists, nurses, and other allied health care professionals). # Using Mann-Whitney U test, * Significant at less than 0.05 significance level

3. Discussion

Most of the studies in the literature (except for the UK study (31)) did not focus on identifying and assigning priorities of electronic prescribing systems software features that could potentially facilitate AMS. Instead, it focused on the effect of electronic prescribing systems compared to paper-based charts (35) and the general impact of electronic prescribing systems and clinical decision support systems on AMS (36–40). This is the first Jordanian study that focused on identifying, assigning and prioritising software features within electronic prescribing systems based on the opinions of the infection specialist health care professionals that could facilitate AMS.

Identifying differences in priorities according to professional group and experience in using electronic prescribing is significant and would help communicate research findings to policy-makers and electronic prescribing manufacturers. The inclusion of other health care professionals (e.g., non-medical prescriber nurses and ward pharmacist) as part of the multidisciplinary team who can play an essential role in AMS in the development of the electronic prescribing and prescription surveillance software features is considered an advantage compared to the UK study (31)

In this study, the prescribing prompt software features within the electronic prescribing and electronic health record ranked by the respondents as the highest priorities were allergy checker, followed by children dose checker, then interaction checker, and adult dose checker. This was consistent with results from a recent cross-sectional UK study (31) that reported allergy, interaction, and dose checkers as the top prescribing prompt software features. However, these are essential prescribing prompt software features but are more of a standard features (31,37). Other infection-directed prompt software features such as restricted antimicrobial authorisation and restricted antimicrobial block by the prescriber were ranked by the respondents as the lowest priority in our study. Similar results were reported from the UK study (31). This could indicate little desire and less support among both Jordanian and UK (31) infection specialists for prompt software features that favour authorisation restriction and antimicrobial block by the prescriber.

The active prescription surveillance software features

ranked by the majority of the respondents as an essential or high priority were included an assurance on patient safety (i.e., daily reports of drug interaction mismatch, missed dose) and the AMS (i.e., a daily report of prescriptions for sepsis of undetermined origin, long intravenous course length and daily report of high-dose aminoglycoside prescription). However, a daily report of ongoing prescriptions of all antimicrobials was ranked by the respondents as the feature of lowest priority which could indicate a lack of enough resources available to review those ongoing prescriptions. Yet, the reasons behind ranking ongoing prescriptions of all antimicrobials as the lowest priority were not collected. Similar results about the prescription surveillance software features were reported from the UK study (31).

The respondents' opinions of the likely impact of prescribing prompt software features and active prescription surveillance software features on clinical, microbiological and process outcomes were predominantly positive. The majority of respondents thought that the prescribing prompt software features and active prescription surveillance software features are likely to improve safety and reduce antimicrobial resistance. This was consistent with results from the UK study (31).

The differences in the priority score (for both the prescribing prompts features and active prescription surveillance features) between the respondents were examined; non-prescribers showed higher priority scores for the active prescription surveillance features than prescribers. Also, respondents with less than one year of experience in using and applying AMS interventions showed higher priority scores for the active prescription surveillance features compared to those with higher experience, possibly reflecting the inter-speciality conflict inherent in such policies, resource implications and the lack of longer-term superiority over persuasive interventions.

Finding from this study demonstrated the core principles of the electronic prescribing and prescription surveillance software features that can be equally appropriate to healthcare systems in other countries (31,36,37,39–41). For example, this study provided an insight into the significance of electronic prescribing system and electronic health record in prioritising for antimicrobial stewardship, examining healthcare professionals' opinions about the prescribing prompt software features and active prescription surveillance software features and its impact on clinical, microbiological and process outcomes were predominantly positive. However, the lack of comparable studies may indirectly affect the scope of our study, which necessitate the need for future studies. Also, studies examining reasons behind ranking these feature is required to improve reach to having a standard national electronic prescribing system prescribing prompt software features and active prescription surveillance software features.

This survey represents the first attempt in Jordan to describe the opinion of infection specialists on the potential for electronic prescribing software to support AMS. The findings illustrate fundamental principles that are equally relevant to health systems in other countries. The survey results reveal considerable demand for additional software features expressed by the healthcare professionals charged with promoting rational use of antimicrobials and a consensus of anticipated positive impact on patient safety and efficiency outcomes. The survey demonstrates key differences in health professionals' opinions of different healthcare benefits of electronic prescribing and confirms the need for a multidisciplinary approach to developing electronic prescribing system specifications. We trust this information will prove valuable to software manufacturers currently developing electronic prescribing systems when prioritizing software functionality and systems interface development and potentially to healthcare commissioners when drafting electronic prescribing system specifications.

One of the limitations of our study is that it is a single centre study. Therefore, healthcare professional opinions from other hospitals in Jordan were not examined; this could affect the generalisability of the results drawn from

this study. Also, some of the software features proposed in this survey may not be technically applicable to other software used in other hospitals in Jordan. This means a large multi-centre and national study is required. Alert fatigue is another major issue, and even though health care professionals perceive a prompt may be a high priority, it may not be effective if alerts are ignored.

Furthermore, the perception of priorities of electronic prescribing features and its translation to AMS and improvement of prescribing practices is questionable at best. Next, this survey had 210 respondents, amongst whom 79 (38%) were interns, and 62% had less than one year of prescribing experience. The limited understanding, particularly from a single centre, makes the validity and generalizability of any knowledge gained from them extremely limited. Moreover, investigators sought to survey "infection control specialists", but their study population does not match their target. Investigators also did not identify whether they are targeting administration (i.e., intravenous) or prescription of antibiotics that include different patient populations. However, the study population comprises tremendous heterogeneity in the types of patients (pediatric, surgery, hospitalized, critically ill), and the priority and needs of such electronic prescribingfeatures are likely to differ across these populations.

4. Conclusion

There is a need for additional prescribing prompt and active prescription surveillance software features to improve prescribing practices and support AMS in Jordan. The study showed that allergy and interaction checker, children and adult dose checker to be the main prescribing prompt prompt software features, with high priority on assuring patient safety and the AMS. The study provides a platform for electronic prescribing design features that may facilitate AMS and inform policymakers in Jordan to react by implementing the electronic prescribing system at the national level. Further research should include multi-site studies evaluating more than one hospital from Jordan.

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نظام الوصفات الإلكترونية وأولويات السجلات الصحية الإلكترونية للإشراف على الية صرف المضادات الحيوية

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ملخص

الأساس المنطقي والأهداف والأهداف: قدمت هذه الدراسة وصفا لميزات تصميم الوصفات الإلكترونية التي قد تسهل الإشراف على الية صرف المضادات الحيوية. هدفت هذه الدراسة إلى تحديد ميزات البرامج داخل أنظمة الوصفات الإلكترونية وتعيين الأولويات لهذه الميزات البرمجية وفقًا لآراء أخصائيي الرعاية الصحية المتخصصين في العدوى. أيضًا، لتحديد أي اختلافات في الأولويات وفقًا للمجموعة المهنية والخبرة في استخدام الوصفات الإلكترونية وإيصال نتائج الأبحاث إلى صانعي السياسات ومصنعي الوصفات الإلكترونية.

الطرق: أجريت الدراسة في مستشفى جامعي وتعليمي كبير (600 سرير) حكومي في عمان، الأردن. تم تسليم الاستبيانات المتعلقة بوصف مضادات الميكروبات يدويًا للمتخصصين ممن لديهم رخصة صرف المضادات الحيوية كالأطباء الباطني والجراحون وأطباء الأطفال وأخصائيي الأمراض المعدية وأخصائيي الرعاية الحرجة وممن ليس لديهم رخصة صرف المضادات الحيوية كالمتدربين الاطباء والصيادلة السريريين والممرضين وغيرهم من أخصائيي الرعاية الصحية الاخرين) والذين قاموا بملء الاستبيان وجها لوجه. بدأ تسليم المسح في 15 مارس 2020 ، وأغلق في 7 أبريل 2020.

النتائج: تم استلام الردود من 210 أفراد متخصصين بتقديم الرعاية الصحية. يمثل المتدربون أكثر من ثلث المستجيبين (ن= 79 ، 37.6٪) ، مع 15.7٪ من أطباء الطب الباطني. من بين المتخصصين في الرعاية الصحية، يعتبر حوالي 44.7٪ (العدد = 94) وصفين لمضادات الميكروبات، بينما يعتبر آخرون غير موصوفين (العدد = 116 ، 55.2٪). أفاد غالبية المستجيبين (ن = 205 ، 97.6٪) باستخدام نظام إلكتروني للوصفات الطبية والسجلات الصحية الإلكترونية لجزء أو كل جزء في مستشفياتهم، حيث أفاد 35.7٪ (ن = 75) منهم باستخدام هذه الأنظمة لأكثر من عام واحد. كانت ميزة "الوصف الفوري" التي لها الأولوية القصوى المعينة هي "تدقيق الحساسية (n = 193) " ، 91.9٪ (متبوعًا "تدقيق الجرعة(n = 192) " ، 91.4٪)

الخلاصة: توضح هذه الدراسة المحاولة الأولى لوصف آراء المتخصصين في الرعاية الصحية في الأردن حول الأهمية المحتملة لوصف ميزات برامج مراقبة الوصفات الطبية السريعة والفعالة على النتائج السريرية والميكروبيولوجية والعملية لدعم الإشراف على الية صرف المضادات الحيوية. تكشف النتائج المستخلصة من هذه الدراسة عن طلب كبير على ميزات البرامج الإضافية التي أعرب عنها المتخصصون في الرعاية الصحية المكلفون بتعزيز الاستخدام الرشيد للمضادات الحيوية وإجماع الآراء على التأثير الإيجابي المتوقع على سلامة المرضى.

الكلمات الدالة: Allophylus serratus ، نشاط مضاد للأكسدة، فحص كيميائي نباتي، مستخلص الكالس.

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