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Original Article

Benchmarking clinical pharmacy services in the United Arab Emirates with United States of America and Sweden

[Evaluación comparativa de los servicios de farmacia clínica en los Emiratos Árabes Unidos con los Estados Unidos de América y Suecia]

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Abstract

Context: Clinical Pharmacy services in the United Arab Emirates (UAE) are evolving, mostly with reference to the advancements in the United States of America (USA). American and Swedish healthcare agencies are operating healthcare facilities in the UAE. Benchmarking the advancements from observations of Clinical Pharmacists or Pharmacists in these regions is valuable.

Aims: To benchmark key characteristics of clinical pharmacy services in the UAE with the USA and Sweden.

Methods: Cross-sectional surveys were carried out, closed-ended questions to assess the association of pharmacist-physician relationship, patients' demand for the clinical pharmacy services, and the importance of clinical pharmacy with various factors. The pharmacists' perception and opinions towards clinical pharmacy roles using open-ended questions were investigated. Data were analyzed using SPSS® V26.

Results: Out of 250 pharmacists approached, 190 completed the questionnaire (76% response rate); most of them, 88.4%, were clinical pharmacists and had more than 2 years in practice. Pharmacists or Clinical Pharmacists from the UAE did rate clinical pharmacy services lower compared to their counterparts in Sweden and the USA, for example, "do patients demand clinical pharmacy services in your country"; [Sweden: (60/64, 93.75%), vs. UAE (17/63, 27.0%), p<0.005] and [USA: (50/63, 79.4%), vs. UAE (17/63, 27.0%), p<0.005]. In addition, physicians' support, time efficiency of clinical pharmacy services, value for money to the payers (p<0.05) were other examples that UAE respondents rated low (p<0.05).

Conclusions: This study suggests that clinical pharmacy services in the UAE need significant improvements to be on par with practices in the USA and Sweden.

Keywords: clinical pharmacy; pharmaceutical health services; United Arab Emirates.

Resumen

Contexto: Los servicios de farmacia clínica en los Emiratos Árabes Unidos (EAU) están evolucionando, principalmente con referencia a los avances en los Estados Unidos de América (EE. UU.). Las agencias de salud estadounidenses y suecas están operando instalaciones de atención médica en los Emiratos Árabes Unidos. Es valioso comparar los avances de las observaciones de los farmacéuticos clínicos o farmacéuticos en estas regiones.

Objetivos: Comparar las características clave de los servicios de farmacia clínica en los EAU con los de EE. UU. y Suecia.

Métodos: Se realizaron encuestas transversales, preguntas cerradas para evaluar la asociación de la relación farmacéutico-médico, la demanda de los pacientes por los servicios de farmacia clínica y la importancia de la farmacia clínica con diversos factores. La percepción y las opiniones de los farmacéuticos sobre los roles de la farmacia clínica mediante preguntas abiertas fueron investigados. Los datos se analizaron con SPSS® V26.

Resultados: De los 250 farmacéuticos abordados, 190 completaron el cuestionario (tasa de respuesta del 76%); la mayoría, el 88,4%, eran farmacéuticos clínicos y tenían más de 2 años de ejercicio. Los farmacéuticos o los farmacéuticos clínicos de los Emiratos Árabes Unidos calificaron los servicios de farmacia clínica más bajos en comparación con sus contrapartes en Suecia y los EE. UU., Por ejemplo, "¿los pacientes exigen servicios de farmacia clínica en su país"; [Suecia: (60/64; 93,75%), vs. Emiratos Árabes Unidos (17/63; 27,0%), p<0,005] y {EE. UU.: (50/63; 79,4%), vs. Emiratos Árabes Unidos (17/63; 27,0%), p<0,005]. Además, el apoyo de los médicos, la eficiencia en el tiempo de los servicios de farmacia clínica, la relación calidad-precio para los pagadores (p<0,05) fueron otros ejemplos que los encuestados de los EAU calificaron como bajos (p<0,05).

Conclusiones: Este estudio sugiere que los servicios de farmacia clínica en los EAU necesitan mejoras significativas para estar a la par con las prácticas en los EE. UU. y Suecia.

Palabras Clave: Emiratos Árabes Unidos; farmacia clínica; servicios de salud farmacéutica.

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INTRODUCTION

The clinical pharmacy concept was mentioned firstly in the 1960s. However, the purpose of clinical pharmacy practice was served well after the implementation of the philosophy of pharmaceutical care in the 1990s (Hepler and Strand, 2018). Over decades, clinical pharmacy has been defined differently by different organizations (Andersen et al., 2014). The European Society of Clinical Pharmacy describes clinical pharmacy (Tomlin, 2013) as "*a health specialty, which describes the activities and services of the clinical pharmacist to develop and promote the rational and appropriate use of medicinal products and services*." The American College of Clinical Pharmacy defines clinical pharmacists as "*accountable for optimal medication therapy in the prevention and treatment of disease or the science and practice of rational medicine use*" (The American College of Clinical Pharmacy, 2007). The United Kingdom (UK) Clinical Pharmacy Association (Clinical Pharmacy Association, 1993) described the clinical pharmacy as "*a movement from a product-orientated custodian to a service-orientated technologist*." Regardless of the plethora of clinical pharmacy definitions, researchers shared a closely identical idea about clinical pharmacy, which is completely different from the traditional role of pharmacists. Many authors agreed that the role of clinical pharmacists had evolved greatly, with pharmacists have more clinical responsibilities and their interventions have a more significant impact on healthcare outcomes (Dashti-Khavidaki et al., 2012; Shah Jainam et al., 2016; Maqbool et al., 2019). Many studies conducted worldwide investigated the value of clinical pharmacy services, and they concluded that clinical pharmacy services are vital to inpatient (Scullin et al., 2007; Bondesson et al., 2012; Khalili et al., 2013) and outpatient care (Overhage and Lukes, 1999).

The healthcare sector in the UAE is evolving fast, but clinical pharmacy services are being offered from what is similar to the services in the USA in some of the American hospitals to no notable services in some other hospitals. As there is variation in the practice, it is essential to collect data from a sample of clinical pharmacists or pharmacists in this regard.

The UAE had a few healthcare care facilities in the seventies, and now the country has thousands of public and private healthcare facilities, including hospitals, medical centers, clinics, pharmacies, and laboratories (Bayanati HR Management System For Federal, 2015). Consequently, increasing demand for pharmacy professionals was seen. The number of clinical pharmacists working in UAE hospitals is low, and their daily clinical practice has been rarely studied. Thus, further research on clinical pharmacy services in the UAE is necessary(Abu-Gharbieh et al., 2010). In addition, In UAE, the pharmacist's attempts to employ the emerging clinical pharmacy duties in the profession have been disappointing. Most of them hardly provide essential patient-oriented services in their practice, such as monitoring the patients' medical process. Therefore, it is important to benchmark key characteristics of clinical pharmacy services in the UAE with the USA and Sweden.

MATERIAL AND METHODS

Study design, sample size, and inclusion criteria

Cross-sectional surveys were carried out, first using a series of close-ended questions to assess the association of pharmacist-physicians relationship, patients' demand for the clinical pharmacy services, and the importance of clinical pharmacy with various factors, such as country, level of education, and years of experience. Then, investigating pharmacists' perceptions and opinions towards clinical pharmacy roles using open-ended questions. The Institutional Review Board of Dubai Pharmacy College for Girls approved the research. IRB approval number is Rec/PG/2019/06. Licensed clinical pharmacists in the UAE, USA, and Sweden were the primary audience of the surveys, but some pharmacists were also included in settings with no clinical pharmacists. Those working in outpatient, sales areas, or occupying administrative positions were excluded. Because originally the study was originally qualitative in

nature, and the sample size calculator in G*Power software (Bell et al., 2007) suggested a sample of 65 clinical pharmacists from each group, the targeted sample size was set at 195 clinical pharmacists. In this study, clinical pharmacy is described as a "*health science discipline whereby pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention*" (Abu-Gharbieh et al., 2010).

Study instrument

A semi-structured interview form was developed after an extensive literature review and then validated. Besides demographic information, the form included both structured and unstructured questions evaluating the opinions of clinical pharmacists toward several topics in clinical pharmacy. The responses of pharmacists to unstructured questions in the survey were coded by the researchers using validated definitions adopted from a previous study conducted in Canada (Al Hamarneh et al., 2011). As shown in Table 1, pharmacists' responses can be patient-centered, drug-focused, or drug distribution-focused. Ambiguously refers to responses that did not fit within any of the other themes (Rosenthal et al., 2011). Two researchers conducted independent coding for the responses and themes. They resolved any disagreement by discussion. If an agreement was not reached, differences were resolved by consultation with a third researcher.

Responses toward "*suggest how to improve clinical pharmacy services*" were categorized into three themes: Educational suggestions, Training suggestions, and administrative suggestions. A committee rated the responses that included three researchers who have immense knowledge and extensive experience in clinical pharmacy.

Statistical analysis

For quantitative measurements, both descriptive and intervention analyses were conducted using SPSS® version 26 (IBM, Chicago, IL, USA). Associations between variables (participant's country, place of work, and years of experience) and opinions about clinical pharmacy were done using the Pearson Chi-Square test ($\chi 2$) and Fisher's Exact test. Additionally, logistic regression models were also constructed to ascertain which variables are the best predictors for clinical pharmacy services time-efficient. Analysis of variance (ANOVA) was used to determine whether there are any statistically significant differences between the means of pharmacists' experience in the UAE, USA, and Sweden. The 95% confidence interval was set for the test whereby the result would be significant if the p-value ≤ 0.05.

Table 1. Operational definitions of clinical pharmacists' responses to unstructured questions.

Category	Definition
Patient-centred	The merging of several models of health care practice (including patient education, self-care, and evidence-based care) into 4 broad areas of intervention: communication with patients, partnership with patients, health promotion, and delivery of care.
Drug-focused	Provision of information about a particular medication OR a particular pharmaceutical function (e.g., a pharmacokinetic service) that is designed to optimize a given outcome of drug therapy for the patient OR drug-related monitoring (e.g., adverse drug events, interactions) and the taking of drug histories.
Drug distribution	Interpretation and evaluation of a prescription, selection, and manipulation or compounding of a pharmaceutical product, labeling and supply of the product in an appropriate container according to legal and regulatory requirements, and provision of information and instructions by a pharmacist, to ensure safe and effective use of the drug by the patient.

RESULTS

To recruit the intended number of clinical pharmacists, 250 pharmacists were approached, 195 completed the questionnaire (76% response rate), of which 5 were excluded due to invalid/missed responses. Of The 190 pharmacists included in the data analysis, 63 (33.2%) were from the UAE, 64 (33.7%) from Sweden, and 63 (33.2%) from the USA. Around one-third, 31.6% of participants had more than 10 years of experience. The total mean of pharmacists' experience was 8.18 years divided as follows: UAE (4.02 years), USA (13.37 years), and Sweden (7.06 years). The ANOVA analysis showed that 32.6% of experience means are significantly associated with the country of work, and it was a strong association.

Most of the respondents agreed 40.0% and strongly agreed 47.9% that their clinical pharmacy services are time-efficient (Fig. 1). Most participants agreed 32.1% and strongly agreed 53.7% with this statement *"Do you think clinical pharmacy services are value for money to the payers?"* (Table 2).

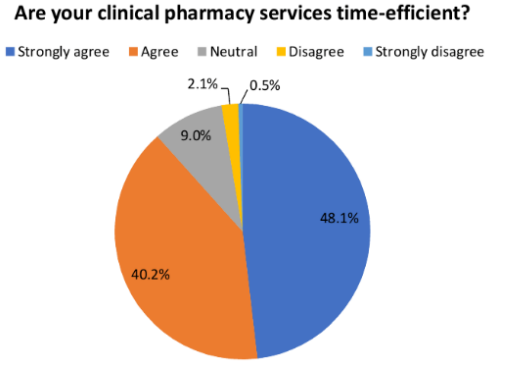

Figure 1. Pharmacists' responses to time efficiency of clinical pharmacy services (n = 190).

The research findings indicate that difference in country of work was significantly related to pharmacists' responses; pharmacists who were currently working in Sweden and the USA were more likely to answer "Always" to this statement "Do patients demand clinical pharmacy services in your country?" compared to pharmacists who were currently working in the UAE; [Sweden: (60/64, 93.75%), vs. UAE: (17/63, 27.0%), p<0.005] and [USA: (50/63, 79.4%), vs. UAE: (17/63, 27.0%), p<0.005]. Participants from the UAE were more likely to respond by "Rarely" when they were asked if physicians support clinical pharmacy services, compared to participants from Sweden and the USA; [UAE: (8/63, 12.7%) vs. Sweden: (0/64, 0.0%), p<0.05], and [UAE: (8/63, 12.7) vs. USA: (1/63, 0.5%), p<0.05].

The results showed that differences in pharmacists' level of experience were significantly affected their opinions toward physicians' support of clinical pharmacy services, time efficiency of clinical pharmacy, and if clinical pharmacy services are value for money to the payers (p<0.05). Pharmacists with more than 10 years of experience were more likely to be based in Sweden compared to those who had 6-10 years of experience who were more likely to be based in the USA and those who had less than 2 years of experience who were more likely to be based in the UAE (Table 3).

As shown in Table 4, The 190 pharmacists provided a total of 559 responses to the question about clinical pharmacy roles (see Tables 5 and 6 for examples). Most responses were patient-centered (222/559, 39.7%), followed by drug-focused (174/559, 31.1%), Ambiguous (103/559, 18.4%), and then drug dispensing responses (60/559, 10.7%). The subanalysis showed that differences in the country could yield different pharmacists' perspectives as pharmacists from the USA and Sweden were more likely to provide patient-centered responses compared to participants from the UAE [Sweden: (83/192, 43.2%), vs. UAE: (48/174, 27.6%), p<0.005] and [USA: (91/193, 47.1%), vs. UAE: (48/174, 27.6%), p<0.005]. However, respondents from the UAE were more likely to have a drug-focused perception of clinical pharmacy services compared to participants from the USA [UAE: (81/174, 46.6%), vs. USA: (42/193, 21.8%), p<0.005] and Sweden [UAE: (81/174, 46.6%), vs. Sweden: (51/192, 26.6%), p<0.005].

DISCUSSION

Clinical pharmacists' interventions to enhance patient safety, minimize medication errors, and develop an effective health care system are docu-

mented worldwide (Tsui et al., 2019). Given the ambitious nature of these roles and goals, it is crucial to fully understand front-line pharmacists/clinical pharmacist perspectives. Setting up clinical pharmacy standards of practice and advancing them based on research and continuing education are essential (Thomas et al., 2019). Consequently, this research would help in developing an understanding of some assumptions of clinical pharmacy culture. An accurate comprehensive picture of the pharmacists' understanding of clinical pharmacy is important because of its powerful influence on pharmacists' behavior. Therefore, if there is a behavior attaining and implementing active and proper clinical pharmacy services, a better understanding of pharmacists' culture and opinions is needed. Benchmarking the USA and Sweden practices are excellent references in identifying areas of improvements in Clinical Pharmacy. Consequently, more comprehensive outcomes are expected. However, the study had few limitations; the data were self-reported, which may incorporate some bias in the behavioral pattern of the respondents. These biases can be found in responses that describe the level of clinical care they provide and the services that make them proud. Therefore, the study may contain many biases, including; careless and extreme responses, which preferred extreme categories (e.g., strongly disagree, strongly agree) and socially desirable responding style, which tended to describe oneself positively and follow social norms and rules. In addition, the sample size was relatively small, and thus our findings could not be generalized. It is still valuable information that each facility and health system in the UAE could take as a reference guide in preparing action plans for improving clinical pharmacy services.

Table 2. Clinical pharmacists' responses based on location.

Items	Responses	Location (n)			Total (n)	χ^2 (df)	p-value
		UAE	USA	Sweden			
Do patients demand clinical pharmacy services in your country?	Always	17	50	60	127	73.26 (4)	<0.001
	Sometimes	31	12	4	47		
	Rarely	14	1	0	15		
Do physicians support clinical pharmacy roles in your country?	Always	19	52	56	127	59.24 (6)	<0.001
	Sometimes	33	10	8	51		
	Rarely	8	1	0	9		
	Never	2	0	0	2		
Is your clinical pharmacy services time-efficient?	Strongly agree	13	47	31	91	60.75 (8)	<0.001
	Agree	29	14	33	76		
	Neutral	15	2	0	17		
	Disagree	4	0	0	4		
	Strongly disagree	1	0	0	1		
Do you think clinical pharmacy services are value for money to the payers?	Strongly agree	26	33	43	102	17.88 (6)	0.007
	Agree	22	20	19	61		
	Neutral	8	9	2	19		
	Disagree	6	1	0	7		

Chi-squared test was used.

Table 3. Clinical pharmacists' responses based on years of experience.

Items	Responses	Experience (years) (n)					Total (n)	χ^2 (df)	[b]p-value
		NE	1-2	3-5	6-10	>10			
Do patients demand clinical pharmacy services in your country?	Always	7	13	18	35	54	127	49.03 (8)	<0.001
	Sometimes	9	12	9	12	5	47		
	Rarely	8	3	2	1	1	15		
Do physicians support clinical pharmacy roles in your country?	Always	7	15	20	35	50	127	30.04 (12)	0.002
	Sometimes	13	10	8	11	9	51		
	Rarely	3	3	1	1	1	9		
	Never	1	0	0	1	0	2		
Is your clinical pharmacy services time-efficient?	Strongly agree	2	10	47	19	35	91	51.50 (16)	<0.001
	Agree	12	12	14	9	24	76		
	Neutral	6	6	2	1	1	17		
	Disagree	3	0	0	1	0	4		
	Strongly disagree	1	0	0	0	0	1		
Do you think clinical pharmacy services are value for money to the payers?	Strongly agree	6	15	12	30	43	39	30.31 (12)	0.003
	Agree	11	9	9	15	19	17		
	Neutral	4	1	7	3	2	4		
	Disagree	3	3	1	0	0	0		
Country	UAE	22	16	10	9	6	63	96.23 (8)	<0.001
	Sweden	0	3	6	13	42	64		
	USA	2	9	14	26	12	63		

Chi-squared test was used. NE: No experience. [b]p value less than 0.05 reflects significant results.

Table 4. Pharmacists' perspectives of clinical pharmacy roles.

Items	Responses	Location (n)			Total (n)	χ^2 (df)	p-value
		UAE	USA	Sweden			
Write a few common clinical pharmacy services happening in your practice?	Patient-centered	48	91	83	222	54.26 (4)	<0.001
	Drug-focused	81	42	51	174		
	Drug dispensing	18	25	17	60		
	Ambiguous	27	35	41	103	9.64 (2)	0.09
Suggest how clinical pharmacy services in your country could be improved.	Training	57	49	66	172		
	Education	39	28	27	94		
	Administrative	87	75	69	231		

Chi-squared test was used.

Table 5. Examples of pharmacists' responses to clinical pharmacy roles.

Category	UAE	USA	Sweden
Patient-centered	Patient education	Consult the patient about how to take their medications	Highlight of patient problems
	Patient history taking	Review of patient medication profile	Patient-oriented treatment
Drug-focused	Drug-drug interaction checking	Ordering, evaluation and timing of serum drug concentrations	Changing drugs that are better suited based on the patient's kidney and liver function
	Pharmacokinetics calculation	Pharmacovigilance	Antibiotic stewardship
Drug dispensing	Dispense prescriptions	Controlling the drug distribution system	Dispensing medications
	Rounding drugs towards	Communicating and coordinating medications	Checking stock
Ambiguous	Work in insurance	Aseptic techniques	Highlight problems that have been found in a patient's medication treatment
	Learn to increase knowledge	Leadership and direction in supervising responsibilities with technicians	Great place to work

Table 6. Examples of pharmacists' suggestions to improve clinical pharmacy.

Category	UAE	USA	Sweden
Training	Training and post-graduate certification of pharmacists	More workshops on explaining the job role	More practical training for students
Education	More education with access to electronic references and resources	Educating doctors about clinical pharmacists' roles	More specialized educational program
Administrative	Increase the staff number	By implementing clinical pharmacists in every hospital and giving them space and respect needed in order to provide the best clinical outcome	By giving full authority for the pharmacist to have a hand in the patient's medication chart, pharmacy automation

The response rate to the survey is close to the best practices, 80%, and is acceptable given the difficulty in getting responses through online surveys. Most of the pharmacists included in the research were clinical pharmacists and had more than 2 years of experience. The average number of years in practice for all participants was 8.18 years (standard deviation 6.85 years). Respondents from

the USA were more experienced in general, followed by Sweden and then the UAE. This could be explained by exploring the history of clinical pharmacy implementation in these countries, and it was known that clinical pharmacy was evolving dramatically in the USA in the middle years of the 1950s, 1960s, and 1970s (Zellmer, 1985). Unlike other some of the other countries reviewed, clinical pharmacy services were relatively less in the UAE (Kheir et al., 2008). However, clinical pharmacy in the UAE is rapidly advancing. There are definite strengths of the growing attention of clinical pharmacy services in the UAE (Dameh, 2009).

Most respondents in the research demonstrated that patients "always" and, to less extent, "sometimes" demand clinical pharmacy services. The subanalysis indicated that the USA and Sweden pharmacists were more likely to answer by "always" compared to the UAE pharmacists, who were more likely to answer by "rarely" to this question. In addition, the results showed that the more experience pharmacists have, the more likelihood of "always" responses. This strong association leads us to one clear conclusion; patients in the USA and Sweden demand clinical pharmacy services more than patients in the UAE. Nevertheless, physicians and nurses in the UAE declared that the clinical pharmacist is an important integral part of the healthcare team (Abu-Gharbieh et al., 2010). Further research on public awareness and patient perception of clinical pharmacy services is necessary. To improve that, implementing campaigns to demonstrate clinical pharmacy services to patients might be necessary.

To assess factors beyond pharmacists' orientation to drug-focused services, the participants are asked to suggest how to improve clinical pharmacy services in their countries and thus activate it to be a service-focused identity. The true purpose behind the question was to identify challenges they have to implement proper clinical pharmacy services. Around half of pharmacists' suggestions were administrative such as increasing the staff number, giving full authority for pharmacists to have a hand in patient's medication chart, and pharmacy automation. Other pharmacists claimed that their interventions were not taken seriously by physicians, so they suggested executive orders to identify each member's roles in the medical process. Many other pharmacists in the study suggested that training and educational interventions improve clinical pharmacy services. Although advanced educational and practical training for pharmacists is needed, not all employers might be encouraging higher education or board certification for their pharmacists; many do in UAE. Pharmacists cannot perform proper clinical pharmacy services without fully accepting clinical pharmacy interventions by healthcare providers. Pharmacy managers may also be responsible for this orientation of pharmacists in the UAE as they direct pharmacists toward more drug-focused activities. Many other studies were in line with the study findings (Nasution et al., 2014; Hambisa et al., 2020) . Salary, lack of commitment, lack of confidence, conflict of interest due to the unclear scope of practice, and poor cooperation with health workers were identified from the USA, Pakistan, and Ethiopia (Hale et al., 2013; Tegegn et al., 2018; Nazir et al., 2015) .

In summary, developing clinical pharmacy services for the benefit of patients and healthcare system performance are studied and described as shown above. The expansion of product-focused pharmacy services to add clinical pharmacy services is happening at varying levels among different countries and even within a country. International benchmarking is a useful process to compare and recommend areas of improvement. This study might be useful for many health systems or facilities in the UAE, showing differences in the adoption of clinical pharmacy in the USA and Sweden. There are multiple opportunities to advance clinical pharmacy services. More investments in this direction would be useful for advancing the pharmacy profession to benefit all stakeholders in healthcare and beyond (Sokn et al., 2019).

CONCLUSIONS

The findings indicated that pharmacists' perspectives of clinical pharmacy services in the UAE were significantly lower than those in the USA and

Sweden. However, clinical pharmacy challenges seemed to be closely identical among included countries. Advocacy efforts are required to empower clinical pharmacists and clarify their duties for other healthcare professionals. This benchmarking exercise showing some differences in clinical pharmacy services in the UAE compared to the USA and Sweden, which will be a reference for the local decision-makers.

CONFLICT OF INTEREST

The authors declare no conflicts of interests.

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AUTHOR CONTRIBUTION:

Contribution	Al Zahawi RH	Baig MR	Thomas D	Al Meslamani AA
Concepts or ideas	x	x	x	
Design	x	x	x	x
Definition of intellectual content	x	x	x	x
Literature search	x			x
Experimental studies	x	x	x	
Data acquisition	x	x	x	
Data analysis	x	x	x	x
Statistical analysis	x	x	x	x
Manuscript preparation	x			x
Manuscript editing	x	x	x	x
Manuscript review	x	x	x	x

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