

## RESEARCH ARTICLE

## OPEN ACCESS

# Self-Assessment of mass gathering (Hajj) pharmaceutical care program in Saudi Arabia

Yousef Ahmed Alomi, Razan Zahran

National Clinical Pharmacy, and Pharmacy Practice Programs Head, Pharmacy R & D Administration Ministry of Health, Riyadh 11392, SAUDI ARABIA.

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\*Correspondence to:

Yousef Ahmed Alomi, Bsc. Pharm, Clin. Pharm, BCPS, BCNSP, DiBA, CDE  
The Past General Manager of General Administration of Pharmaceutical Care Head, National Clinical Pharmacy, and Pharmacy Practice Programs Head, Pharmacy R & D Administration General Administration of pharmaceutical care Ministry of Health, Riyadh 11392, SAUDI ARABIA.  
Email: yalomi@gmail.com

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## Abstract

**Introduction:** Once a year, Muslims of every ethnic group, the Hajj is the fifth and final pillar of Islam. It occurs in the month of Dhul Hijjah which is the twelfth month of the Islamic lunar calendar. It is the journey that every sane adult Muslim must undertake at least once in their lives if they can afford it and are physically able. This study was done to assess pharmaceutical care during mass gathering Hajj period. **Method:** We performed a questionnaire based on the American model of Center for Diseases Control (CDC) and Institution of Safe Medication Practice (ISMP). It consisted of two part; the first one about necessary demographic information, the second part based on ten selected elements of basic pharmaceutical care. It designed through survey website and distributed through social media. It was at the mid-twelve month of Hijri date September 28, 2015 (15 du alhajia 1436)–January 15, 2016 (5 Rabeea Althani1437). The authors followed the responders with several messages by social media as reminding. The survey analyzed by monkey study. **Results:** The number of responder at first part sixty responders, with the majority of them pharmacists 52 (86.67%). Of those Males had 48 (80%) and Females 12 (20%). The mean age +/- SD was 65 +/- 20 years. The responders were Represent of Administration of Hajj Services 7 (53.8%), followed by Nurses 6 (46.2%) and clinicians 5 (38.5%), The common diseases in Hajj were Diabetes Mellitus, Hypertension, and Asthma. In the core elements; the high percentages basic elements was reporting information to staff on improving drug therapy during Hajj use and related problem 11(44%). It followed education and research 18 (37.5%) and by Action Support to Optimal Drug Therapy During the month of Hajj Use Policies 35 (36%). The lowest percentages of answered Yes leadership support 5 (19.23%). **Conclusion:** Mass Gathering Pharmaceutical Care services were limited. Targeting of applying mass gathering clinical pharmacy program, pharmacy infection control, increase clinical pharmacist and distribution pharmacist, mass gathering medication therapy management, and mass pharmacoconomics program, it improve patients outcome and quality of life and avoid unnecessary health care cost. **Key word:** Mass gathering, Pharmaceutical care, Hajj, Umrah, Assessment, Pharmacist, Saudi Arabia,

## INTRODUCTION

Each year several million of Muslim pilgrims visit Saudi Arabia. Those people perform the fifth pillar in Islam called Hajj. The Hajj period is month twelve of Islamic Hijri calendar date. It almost ten days starts from 5-15 each year. During this time, some Muslims visited both the Holy Cities Makkah and Almadina, other visited only Makkah. Theses number increases on an annual basis. The government of King of Saudi Arabia proud to provide all services to facilitate their Hajj including but not limited; health care services, environmental safety, and security, financial and trade services, Islamic



religious services, the Holy mosque services, and other Hajj-related services. Ministry of Health in Saudi Arabia provides Healthcare services. It one of the biggest services provided in this short of a period in the entire world. It had more seventeen hospitals, 150 primary health centers, both temporary and permanent hospitals. The health care provided reach to more 24,000 physicians, pharmacist, nurses, and other care specialties. At very full and crowded area there are several diseases can found during this period including heat exhaustion, and sun stroke, common infectious diseases with high mortalities of heart and blood vessels disease, cardio-respiratory failure, senility, and pneumonia asthma and bronchitis.<sup>[1]</sup>

With imperative ceremony MOH collaborates with several international and national organizations to provide those services for current WHO, international university specialties in mass gathering, and all local college of medicine, nurses, pharmacy. MOH set up some medical regulation to prevent public health diseases including vaccination to all non-immunized pilgrims, infection control program, all hajj prophylaxis, and management related to drug therapy in all medical or surgical of pediatrics specialties. Also; MOH established strategic planning for Hajj services in coming ten years.<sup>[2]</sup> In 2012, MOH established Saudi Global Center for Mass Gathering Medicine (GCMGM), and oversee by board headed by the Saudi Minister of Health, with a membership of experts from “World Health Organization (WHO), University College London, Public Health England, the London School of Hygiene & Tropical Medicine, the Saudi Council for Health Specialties, and King Abdul-Aziz City for Science and Technology”.<sup>[3]</sup> The general administration of pharmaceutical care founded major strategic planning for mass gathering Hajj and Umrah, its hat’s including but not limited to the Mass gathering pharmaceutical care program, pharmacy infection control, national pharmacy practice and clinical pharmacy programs during Hajj period.<sup>[4-6]</sup>

In the literature series topics about mass gathering during Hajj periods published in peer review journal. It discussed the common diseases found during Hajj period, MOH operation plan at Hajj, the emergence of medicine at Hajj, Non-communicable potential risks of mass gathering Hajj, Infectious disease surveillance at Hajj, hospital infection control, and researchers model of mass gathering medicine and application during Hajj period.<sup>[7-15]</sup> Although few studies discussed medication related issues, for the instant; the report by Al-Tawfiq JA that 84% of pilgrims received antibiotics for upper respiratory tract infection, 17% of Pakistani pilgrims received antibiotics, the most medication during Hajj for prophylaxis Ciprofloxacin.<sup>[16]</sup> Another study

discussed the outpatient services during Hajj at one hospital; they found the most medication prescribed Antibiotics 43.3% followed by an Analgesics and Antipyretic 25.2% and Medication for Ischemic Heart Disease (IHD), Chronic Renal Failure (CRF), and Central nervous system disorder (CNS disorder).<sup>[17]</sup> One study discussed adherence Anti-Retroviral Therapy; they found 51.6% of patients missed, at least, one dose of Anti-Retroviral dose compared 18.5% during a non-hajj period.<sup>[18]</sup> However, the authors not familiar with any studies discussed pharmaceutical care during Hajj periods for the instant; pharmacy practice at Hajj time, clinical pharmacy at Hajj, medication safety during Hajj, prescribing patterns, workforce pharmacist at Hajj. The goal of this study to explore the self-assessment of selected core elements of the mass gathering of pharmaceutical care program during Hajj 2015 G (1436 H) in Saudi Arabia.

## METHODS

The study was an observational study survey sent to health care providers all around Saudi Arabia. The health care providers who were part of the mass gathering answered the questionnaire. The study conducted close end questions. It based on core elements of hospital antibiotic stewardship programs, and Institution of Save Medication Practice (ISMP) for self-assessment of medication safety in hospitals American Model of Center for Diseases Control (CDC);<sup>[19-20]</sup> that composed of two parts: The first section of the investigation carried out on the pharmacist demographic data. The second part consisting of questions about selected core elements including; leadership support, accountability, drug expertise, and key support for the drug therapy during Hajj program action support to optimal medication during the month of Hajj use policies. The diagnosis and diseases during Hajj particular intervention, tracking: monitoring drug therapy during Hajj prescribing, use, process measures, drug treatment during Hajj utilization and outcome measures, reporting information to staff on improving drug therapy during Hajj use and related problem, education and research. It was composed of questions that filled by the pharmacist, Physicians and nurses asking about the self-assessment of mass gathering (Hajj and Umrah) of pharmaceutical care in Hajj period 2016. The questions were either answered yes, no or I do not know. Questions covered pharmacotherapy, drug distribution, monitoring and drug counselling. The questionnaire sent to health care professionals through monkey survey during the month of Hajj September 28, 2015 (15 du alhajia 1436)–January 15, 2016 (5 Rabea Althani1437). The data was then analyzed using monkey survey analysis.

## RESULTS

The number of responder at first part sixty responders, with 52 (86.67%) of them were pharmacists, 6 (10.00%) physicians, and 2 (3.33 %) nurses. Males had 48 (80%) and Females 12 (20%). The mean age +/- SD was 65 +/- 20 years. The high percentage 35 (58.33%) was in a group of age 20-40 years Followed by group 40-65 years 24 (40%), 12-20 year 1 (1.67%). The most of the responders worked at MOH 22 (36.67%) followed by non-MOH governmental hospitals 19 (31.67%) and General Directorate of medical affairs 8 (13.33%) as showed in Table 1. Most of the responders from Medina 13 (21.67%) followed by Riyadh 11 (21.67%) and Makka 10 (18.33%) as showed in Table 2. The responders were Represent of Administration of Hajj Services 7 (53.8%), followed by Nurses 6 (46.2%) and clinicians 5 (38.5%), Clinical Auditing or Healthcare Epidemiology, Quality Improvement, and Information Technology (IT) as showed in Table 3. The common diseases in Hajj period need to follow up drug therapy are Diabetes Mellitus, Hypertension, and Asthma 9 (69.2%) as showed in Table 4. In the core elements answered Yes reporting information to staff on improving drug therapy during Hajj use and related problem 11(44%), followed education and research 18 (37.5%) and by Action Support to Optimal Drug Therapy During the month of Hajj Use Policies 35 (36%). The lowest percentages of answered Yes leadership support 5 (19.23%) as showed in Table 5.

## DISCUSSIONS

The investigation for implementing of pharmaceutical care during Hajj is the very potential report and the first done in Saudi Arabia or Middle East countries. In the study the authors found the numbers of responders few; most of our professional not aware of the general survey during Hajj or not always easy receive that during Hajj period. Also, some of them do not have much time during Hajj. Majority of

**Table 1: Workforce Responders**

Type of Health Facility	Response n (%)
Ministry of health	22 (36.7)
MOH- government hospitals	19 (31.7)
General Directorate of medical affairs	8 (13.3)
Non-MOH government hospitals	3 (5)
MOH-primary care center	3 (5)
Other (please specify)	3 (5)
community Pharmacy	2 (3.3)
Non-MOH primary care center	0 (0.0)
Total	60 (100)

**Table 2: Responders Regions**

Answer Options	Response n (%)
Madina	13(21.7)
Riyadh	11(18.3)
Makkah	10 (16.7)
Jeddah	8 (13.3)
East Province	6(10)
Quseen	4(6.7)
Tabouk	2(3.3)
Alhasa	2(3.3)
Hail	1(1.7)
Aljouf	0(0.0)
Bisha	1(1.7)
Jazan	1(1.7)
Alqurayat	1(1.7)
Aseer	0(0.0)
Albaha	0(0.0)
North Boarder	0(0.0)
Qunfetha	0(0.0)
Taif	0(0.0)
Other (please specify)	0(0.0)
Total	60 (100%)

**Table 3: Key Support for the Drug Therapy During Hajj**

Answer Options	Response n (%)
Represent of Administration of Hajj Services	7 (53.8)
Nursing	6 (46.2)
Clinicians	5(38.5)
Clinical Auditing or Healthcare Epidemiology	5(38.5)
Quality Improvement	5(38.5)
Information Technology (IT)	5(38.5)
Laboratory	4(30.8)

the pilgrims stayed in the both holy cities for 2-4 weeks after Hajj; with still they busy of providing services to pilgrims. Most of our responders were pharmacists; this is normal finding. The survey about pharmacy related issues and may be some point not understood very well by other health care providers. The gender of responders most of them were male, most of thge workers were male especially during hajj, the female some does not like crowded people or area. The responders most of them were a young adults and old adults. The most of our worker during Hajj period at that age, those ages of years either direct contact with patients, works twelve duties, and work as administrators or planner at medical supply.

**Table 4: Diseases conditions and Problems during mass gathering (Hajj)**

Answer Options	Response N (%)
Diabetes Mellitus	9 (69.2)
Hypertension	9(69.2)
Asthma	9(69.2)
Epilepsy	8(61.5)
Emergency Diseases	8(61.5)
Common Infectious Diseases Disorder	7(53.8)
Myocardial Infarction	7(53.8)
Heart Failure	7(53.8)
Common GIT Disorder	7(53.8)
Anticoagulation Prevention and Treatment	6(46.2)
Common psychiatric Disorder	6(46.2)
Adult Vaccination	6(46.2)
Critical Care Diseases	6(46.2)
Pharmacy Infection Control	6(46.2)
Acute and Chronic Renal Diseases	6(46.2)
Antibiotics for Surgical Prophylaxis	5(38.5)
Lipid Disorder	4(30.8)
Acute and Chronic Pain Management	4(30.8)
Pediatrics Diseases	4(30.8)
Other (please specify)	0(0.0)

Note: Answered question: 13, Skipped question 47

The most of the responders worked at MOH this typically results founded, MOH responsible organization of all health related Hajj. Most of health care staff from MOH. The others staff came from the collaboration between MOH and other government sectors like National Guard health care services sector, Military health care services section, and Universities health care services sector.<sup>[1]</sup> The majority of the responders came from Almadina and Riyadh. This due large number of responders did not participate in the study, although the most of health care providers initially from Makkah city.

The key support for the drug therapy during Hajj program was representing of administration of Hajj services. The authors rely on that, the central committee of Hajj for healthcare services related subcommittee. They are expert in this field and very comfortable to them to support Hajj related health care services. Also, they are working as an organizers or planners. It is vital for them to support any specific research for Hajj, after their very review all Hajj performance by the end of each year deep comprehensively. They discuss strengthens and weakness Hajj related health care services to avoid those next year.<sup>[2]</sup> The common

diseases in Hajj period need to follow-up drug therapy are Diabetes Mellitus, Hypertension, and Asthma this finding comparable of MOH statistics those conditions related death.<sup>[1]</sup>

In the core elements answered yes; the reporting information to staff on improving drug therapy during Hajj. All pilgrims either visited clinics or emergency or admitted to hospital. The health care provider documented all related information including medications. Also, MOH provided 937 to answer any question to the public; they organized with several General administrations including pharmaceutical care; it adopted national drug information centers with the network of local drug information centers to answer of healthcare professional inquiries, there is no comparable studies existed.<sup>[2]</sup>

Education and research during Hajj period had a second high percentage of core elements requirements; the authors expected to find that, education and scholar administration provide on annual mandatory an education courses about Hajj related health care for all health care professional; this year pharmacists included. Also, the pharmacists

<b>Table 5: Results of core key elements of Mass Gathering Pharmaceutical care</b>				
<b>Characteristics</b>	<b>Total answered questions</b>	<b>Answer “Yes”</b>	<b>Answer “No”</b>	<b>Answer “I do not know.”</b>
<b>Leadership Support</b>	<b>26</b>	<b>5 (19.23%)</b>	<b>12 (46.15%)</b>	<b>7 (26.9%)</b>
Hospital services During Hajj do you have a written statement to support the leadership efforts to improve drug therapy?	13	2(15.3%)	6(46.1%)	5(38.4%)
Does your facility receive any budgeted financial assistance for drug treatment during Hajj Activities?	13	5(38.4%)	6(46.1%)	2(15.3%)
<b>Accountability</b>	<b>12</b>	<b>3(25%)</b>	<b>7(58.3%)</b>	<b>2(16.6%)</b>
During the month of Hajj Is there a pharmacist leader responsible for program outcomes of drug therapy?	12	3(25%)	7(58.3%)	2(16.6%)
<b>Drug Expertise</b>	<b>11</b>	<b>3(27.2%)</b>	<b>5(45.4%)</b>	<b>3(27.2%)</b>
Drug expertise Is there a Physician or Pharmacist leader responsible for working to improve drug therapy during the Hajj period.	11	3(27.2%)	5(45.4%)	3(27.2%)
<b>Action Support to Optimal Drug Therapy During the month of Hajj Use Policies</b>	<b>97</b>	<b>35 (36%)</b>	<b>49 (50.5%)</b>	<b>13 (13.5%)</b>
Specific treatment recommendations	13	7(53.8%)	5(38.4%)	1 (7.69%)
Physician or pharmacist review courses of therapy	12	5(41.6%)	5(41.6%)	2(16.6%)
Dose adjustments	12	6(50%)	5(41.6%)	1(8.3%)
Dose optimization to optimize the treatment of diseases	12	4(33.3%)	7(58.3%)	1(8.3%)
Switch patient medication	12	2(16.6%)	8(66.6%)	2(16.6%)
Do you have system to switch patient medication from several times to one or twice daily during month of Hajj	12	3(25%)	7(58.3%)	2(16.6%)
During the month of Hajj is time-sensitive automatic stop orders for specified drug therapy prescriptions	12	3(25%)	8(66.6%)	1(8.3%)
Does your facility have method to call center 937 for asking national drug information center about medication use during Hajj	12	5(41.6%)	4(33.3%)	3(25%)
<b>Tracking: Monitoring Drug Therapy during Hajj Prescribing, Use, Process Measures</b>	<b>36</b>	<b>8 (22.2%)</b>	<b>19 (52.8%)</b>	<b>9 (25%)</b>
Monitor adherence	12	4(33.3%)	5(41.6%)	3(25%)
Monitor adherence to facility-specific treatment recommendations?	12	2(16.6%)	7(58.3%)	3(25%)
Monitor compliance with one of more of the targeted interventions in place?	12	2(16.6%)	7(58.3%)	3(25%)
<b>Drug Therapy During Hajj use and Outcome Measures</b>	<b>46</b>	<b>13 (28.26%)</b>	<b>19 (41.3%)</b>	<b>12 (26.1%)</b>
Does your track facility rates of incidence and rate of ER Admission right drug-related problem?	12	3(25%)	4(33.3%)	3(25%)
Does your facility follow up and Report adherence to drug therapy during the month of Hajj Protocol?	12	2(16.6%)	7(58.3%)	3(25%)
Does your facility have medication safety system for patients during Hajj?	12	7(58.3%)	3(25%)	2(16.6%)
Does your facility monitor drug therapy use during the month of Hajj using one of the following metric levels by direct expenditures for drug treatment during Hajj.(purchasing cost)	10	1(10%)	5(50%)	4(40%)
<b>Reporting Information to Staff on improving Drug Therapy during Hajj use and Related Problem</b>	<b>25</b>	<b>11 (44%)</b>	<b>9 (36%)</b>	<b>5 (20%)</b>
Does your drug therapy programs share specific reports on medication use with prescribers during Hajj	12	4(33.3%)	4(33.3%)	4(33.3%)
Do prescribers ever receive direct personalized communication about how they can improve their drug therapy prescribing during Hajj?	13	7(53.8%)	5(38.4%)	1(7.6%)
<b>Education and Research</b>	<b>48</b>	<b>18 (37.5%)</b>	<b>21 (43.75%)</b>	<b>9 (18.75%)</b>
Does your drug therapy during the month of Hajj program share facility-specific reports on medications use with prescribers?	12	4(33.3%)	6(50%)	2(16.6%)
Program provide education to patients or health caregiver on Anticoagulation	12	7(58.3%)	3(25%)	2(16.6%)
learn any topics about therapy program during Hajj?	12	6(50%)	3(25%)	3(25%)
Does your facility work on research programs in Hajj	12	1(8.3%)	9(75%)	2(16.6%)

started this year to give basic medication course to all healthcare professionals. Besides, general administration of pharmaceutical care began researches during Hajj period and this report part of them based on strategic pharmacy plan.<sup>[4]</sup> In the Action Support to Optimal Drug Therapy During element, in this year MOH provided an opened access of Up-to-date overall entire Saudi Arabia. Also, the pharmacists try to provide drug information resources through Lexi-drug information during Hajj time, the public education about medication with the distribution of necessary drug information for patients. It published in six languages countries for instant; Arabic, English, Indian, France, Philippines as showed in Figure 1.

There was a question that pointed out whether the health care providers following a certain guideline for the health authority emphasizing on patients medication regimen and patient dose adjustments in the month of Hajj. The answers revealed that half of guidelines followed at such time. There is study to measure the adherence of management guidelines. Healthcare providers required explaining whether the drugs are monitored there a pharmaceutical care program for compliance and adherence. Were there patients being admitted due to drug related problems? Unfortunately all the answers still lower percentages. The results lower what found the finding of Habib AG *et.al.* Study,<sup>[18]</sup> there is such system to improve medication adherence and maybe

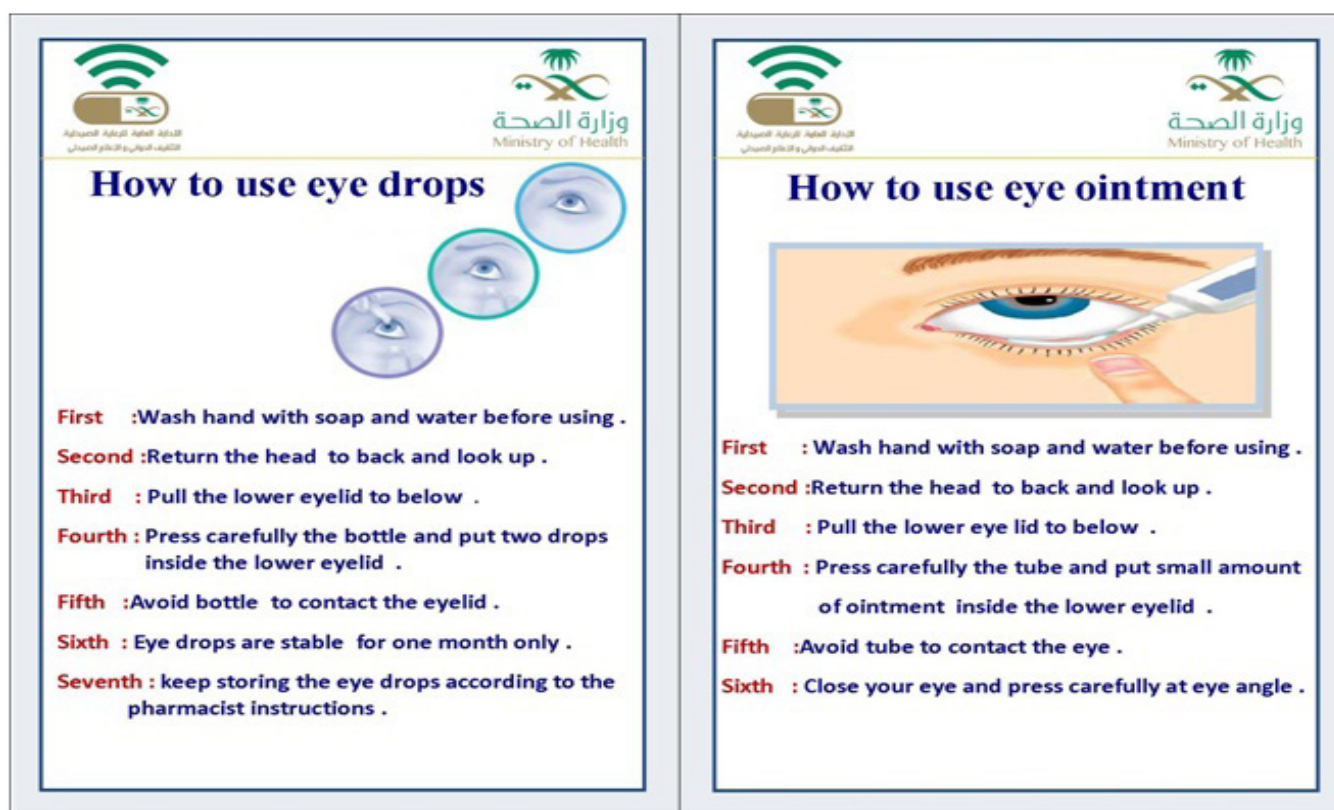


Figure 1: Patient Medication Education Brochures.

difficult to apply sometimes. The lowest percentages of core elements answered yes; it was leadership support. The authors expected this finding; there no pharmacy representative at any Hajj committees. Beside; the central committee of mass gathering pharmaceutical care in each region not existed.

### Limitations of the study

Despite the study provide the reader initial vision of the assessment of mass gathering of pharmaceutical care during

at the Holy places of Hajj and Umrah in Saudi Arabia. It contains several limitations for examples; it is the pilot study with the small numbers of responders, some inquiries not answered, and most of the responders of them were pharmacists. The authors recommend repeating this study on annual bases with high number of subjects

### CONCLUSION

Despite the limitation of the survey, however, it is the first study measure the extent and explored pharmaceutical care

for the mass gathering of Hajj in Saudi Arabia. It showed the gap analysis between real practice situation and the optimal level of pharmacy strategic planning in Saudi Arabia. The comprehensive application of mass gathering of pharmaceutical care and related issues should implement including but not limited to the following; Central Committee of the mass gathering of pharmaceutical care, mass gathering medication safety, mass gathering clinical pharmacy. Also; the mass gathering medication therapy management, mass gathering pharmacy infection control, mass gathering pharmacoconomics, with mass gathering pharmacy researches. Targeting that element with the regular annual survey of pharmaceutical care during Hajj; it improve pharmacy services, prevent common diseases complications, and improve pilgrims' diseases outcomes and quality of life.

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### CONFLICT OF INTEREST

There is no conflict of interest with any financial/research/academic organization, with regards to the content/research work discussed in the manuscript

### ABBREVIATION USED

**GCMGM:** Saudi Global Center for Mass Gathering Medicine; **WHO:** World Health Organization; **CDC:** Center for Diseases Control; **ISMP:** Institution of Safe Medication Practice; **IHD:** Ischemic Heart Disease; **CRF:** Chronic Renal Failure.

### REFERENCES

1. Statistics Book—Statistical Book for Year 2014. Ministry of Health Portal, Kingdom of Saudi Arabia. Accessed 2016 February 8. Available from: <http://www.moh.gov.sa/Ministry/Statistics/book/Documents/1435.pdf>
2. About the Ministry—Strategy. Ministry of Health Portal, Kingdom of Saudi Arabia. Available from: <http://www.moh.gov.sa/en/Ministry/About/Pages/Strategy.aspx> (Accessed March 15, 2016)
3. Memish ZA. Mass gatherings medicine: international cooperation and progress. *Lancet*. 2014;(383):2031-2.
4. Alomi YA, Alghamdi SJ, Alattiyh RA. Strategic Plan of General Administration of Pharmaceutical Care at Ministry of Health in Saudi Arabia 2012 – 2022. *J Pharm Pharm Sci*. 2015;1(3):1-8.
5. Alomi YA. National Pharmacy Practice Programs at Ministry of Health in Saudi Arabia. *J Pharm Pharm Sci*. 2015;1(2):17-8.
6. Alomi YA. (2015) Mass Gathering of Pharmaceutical Care, General Administration of Pharmaceutical. Ministry of Health, Saudi Arabia.
7. Memish ZA, Stephens GM, Steff en R, Ahmed QA. Emergence of medicine for mass gatherings: lessons from the Hajj. *Lancet Infect Dis*. 2012;12:56-65.
8. Abubakar I, Gautret P, Brunette GW. Global perspectives for prevention of infectious diseases associated with mass gatherings. *Lancet Infect Dis*. 2012;12(1):66-74.
9. Steff en R, Bouchama A, Johansson A. Non-communicable health risks during mass gatherings. *Lancet Infect Dis*. 2012;12(2):142-9.
10. Johansson A, Batty M, Hayashi K, Albar O, Marcozzi D, Memish ZA. Crowd and environmental management during mass gatherings. *Lancet Infect Dis*. 2012;12(2):150-6.
11. Kamran K. Infectious disease surveillance and modeling across geographic frontiers and scientific specialties. *Lancet Infect Dis*. 2012;12(3):222-30.
12. Tam SJ. Research agenda for mass gatherings: a call to action. *Lancet Infect Dis*. 2012;12(3):231-9.
13. Al-Tawfiq JA, Ziad A, Memish ZA. Mass gathering medicine: 2014 Hajj and Umra preparation as a leading example. *International Journal of Infectious Diseases*. 2014;27:26-31.
14. A Madani TA. Steady improvement of infection control services in six community hospitals in Makkah following annual audits during Hajj for four consecutive years. *BMC Infectious Diseases*. 2006;6(1):135;1-9.
15. Al-Tawfiq JA, Memish ZA. Potential risk for drug resistance globalization at the Hajj. *Clin Microbiol Infect*. 2015;21(2):109-14.
16. Shakir HS. Outpatient Services during (1423 h) Hajj Season. *Sultan Qaboos University Medical Journal*. 2006;6(1):47-50.
17. Habib AG. Anti-Retroviral Therapy Among HIV Infected Travelers to Hajj Pilgrimage. *Journal of Travel Medicine*. 2010;17(Issue 3):176-81.
18. Implementation Resources—Checklist for Core Elements of Hospital Antibiotic Stewardship Programs (2015) Center for Diseases Control and Prevention Portal, USA.
19. ISMP Self-Assessment—ISMP Medication Safety Self-Assessment for Hospitals (2015) Institute for Safe Medication Practices USA.
20. Alomi YA. National Drug Information Center Program at Ministry of Health in Saudi Arabia. *Adv Pharmacoepidemiol Drug Saf*. 2016;5:140.

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