Supplementary S1

Questionnaire for “Pharmacists’ Approach to Oncology Medicines Shortages: Results of a Cross-sectional Survey in Pakistan”

Informed consent

Oncology medicines shortage is a global issue affecting patients, stakeholders, and professionals. Pakistan is a low-income country with an increasing cancer burden, no national cancer registry, and imports most of its anti-cancer medicines. The shortages of these essential medicines can lead to serious impacts. The objective of this study is to explore the current situation of oncology medicines shortages, its causes, impacts, and adopted mitigation strategies.

You are invited to participate in a research project about “pharmacists’ approach to oncology medicines shortages: results of a cross-sectional survey in Pakistan”. This online survey may take about 5-10 minutes to complete and it is for those pharmacists who have more than one year of experience in oncology medicines. Participation is voluntary, and responses will be kept confidential. Submission of the survey will be interpreted as your informed consent to participate. If you have any questions about the research, please contact the Principal Investigator, Sundus Shukar, via email at sundusshukar@gmail.com. Thank you for your cooperation.

Supplementary file

Basic information:

Demographics

1. Gender:
   a. Male
   b. Female
2. Age:
3. Are you a pharmacist dealing with oncology medicines?
   a. Yes
   b. No
4. Years of experience:
   1. <1
   2. 2-5
   3. 6-10
   4. 11-20
   5. >20

Organization Information

5. Organization’s name:
6. Organization’s affiliation:
7. Facility type:
   a. Government Hospital
   b. Government/Academic Hospital
   c. Semi-government Hospital
   d. Semi-government/Academic Hospital
   e. Private Hospital
   f. Foundation/Trust Hospital
   g. Others
8. Facility Location: Province_________, City____________

Medicines Shortage Information:

9. Have you experienced oncology medicines shortages in your practice during last one year? What type of medicines were they?
   a. Yes, but I don’t know about these medicines
   b. Chemotherapy
   c. Non-chemotherapy (supportive agents)
   d. both Chemotherapy and Non-chemotherapy (supportive agents)
   e. No (if no, please go directly to question 17)
10. Is oncology medicines shortage a current problem in your hospital?
    a. Yes
    b. No
    c. Unsure
11. How often do oncology medicines shortages occur in your practice?
    a. Daily
    b. Weekly
    c. Monthly
    d. Half-yearly
    e. Yearly
12. How long would you estimate the oncology medicines shortage normally lasts for?
   a. < 3 months
   b. 3-6 months
   c. 6-9 months
   d. 9-12 months
   e. > 12 months

13. Which type of oncology medicines do you frequently experience to be in short supply?
   a. Branded medicines
   b. Generic medicines
   c. Bio-similar medicines
   d. None of them

14. From your experience, which dosage form in short supply?
   a. Oral
   b. Injectable
   c. Topical
   d. Unsure
   e. Others, please specify: _____________________________

15. How do you find out about oncology medicines shortages? Please mark all that apply.
   a. Notification of DRAP
   b. Notification of manufacturer
   c. Wholesaler/distributors
   d. We have to enquire about unavailable medicines
   e. Other, please specify: _____________________________

16. Compared with the previous year, is there any change in the number of oncology medicines shortages in your hospital?
   a. No
   b. There is an increase of shortages
   c. There is a decrease of shortages
   d. Unsure

17. Which institution has a major responsibility for the management of oncology medicines shortages in Pakistan?
   a. Federal agencies
   b. Provincial agencies
   c. Hospital itself
   d. Unsure
18. Please recall the oncology medicines which were short in your hospital during the last one year.

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<thead>
<tr>
<th>Sr No</th>
<th>Brand</th>
<th>Generic</th>
<th>Dosage</th>
<th>Strength</th>
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Causes:

19. Which of the below categories best describes the main external source of supply of oncology medicines to your hospital?
   a. Directly from the pharmaceutical company
   b. Distributors
   c. Wholesalers
   d. Retailers
   e. Others, please specify: ________________________________

20. From which category of external supply does your hospital most frequently encounter problems related to oncology medicines shortages? Please mark all that apply.
   a. Pharmaceutical companies
   b. Distributor
   c. Wholesalers
   d. Retailer
   e. Others, please specify: ________________________________

Impacts:

21. What were the impacts on patients due to oncology medicines shortages? Please mark all that apply.
   a. Increased patient monitoring (laboratory or clinically)
   b. Use of alternative medicines or omitted medicines without substitution, leading to suboptimal results
   c. Delayed care until the medicines supply resume
d. Been transferred to other institutions for treatment/medication

e. Increased length of hospitalization

f. Readmission due to adverse events/ treatment failure/relapse

g. Associated care cancellations (surgery: bone marrow transplantation)

h. Death

i. Others, please specify: __________________________________

22. What extra efforts your hospital has to do to cope with the oncology medicines shortages?

a. Staff (clinical & non-clinical) has to spend extra time and efforts resulting in increased financial pressure

b. Staff (clinical & non-clinical) has to spend extra time and efforts without increasing financial pressure

c. Institution has to hire new personals to manage medicines shortages

d. Hospital has not been affected by the shortage

23. What were the impacts of oncology medicines shortages on clinical trials?

a. Clinical trials delayed due to shortages.

b. Clinical trials stopped due to shortages.

c. No effect

d. Unsure

24. What are the impacts of medicines shortages on you, personally as a pharmacist?

a. I have to face ethical issues in making decision about the priority of patients for medicines dispensing.

b. I become stressed and exasperated with fear of losing trust of patients.

c. I have to put critical considerations and extra mental /physical efforts in a re-scheduled treatment due to oncology medicines shortages.

d. I need more time to educate or counsel patients and other healthcare professionals due to oncology medicines shortage.

25. What type of responses you get from patients/caregivers after sharing the oncology medicines shortage issue?

a. Patients/caregiver cooperated with pharmacists in managing shortage.
b. Patients become frustrated however they ask pharmacist about solution.

c. Patients/caregivers become violent.

d. Patients/caregivers went to other facility.

e. Others, please specify: ________________________________

26. What is the impact of oncology medicines shortage on drug prices?

a. Increase in prices by manufacturers due to medicines shortages

b. Increased price due to purchasing from the “gray” or “parallel market”

c. Price decrease due to shortage

d. Did not change

e. Unsure

f. Others, please specify: ________________________________

Mitigation strategies:

27. Is there any reporting system/platform for oncology medicines shortages in your hospital or any record for oncology medicines shortages in your inventory system?

a. There is a reporting system/platform for medicines shortages in our institution

b. There is record for medicines shortages in inventory system but no reporting system/platform for medicines shortages.

c. Both are absent.

d. Unsure

28. Do you think a reporting system, program or policy is necessary?

a. Yes

b. No

c. Unsure

29. What were the actions pharmacists usually taken to cope with such cancer treatment shortage? Please mark all that apply.

a. Redistribute and use available stock carefully

b. Use alternative optimal or suboptimal medication after conducting multidisciplinary discussion

c. Cancel or delay therapy until availability of drugs if no alternative available

d. Ask hospital to obtained medicines from another health facility

e. Ask hospital to obtained drug from another supplier

f. Transfer the patient to another institution that has a supply of the needed medication for cancer treatment
g. Ask patient to bring his/her cancer medication, if possible
h. Ask hospital to imported medicines from another country
i. Other, please specify: ________________________________

30. On average, how long it will take to find a proper solution when an oncology medicine is in shortage?
   a. < 1 hour
   b. 1 to 5 hours
   c. 6-10 hours
   d. >10 hours
   e. Unsure