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ORIGINAL ARTICLE

Suggested modifications in oncology/hematology inpatient service in Saudi Arabia during coronavirus disease-2019 (COVID-19) pandemic

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ABSTRACT

Background: Management of cancer patients in the current era of coronavirus disease-2019 (COVID-19) pandemic poses significant challenges on health-care systems. However, it is mandatory to keep the required level of care of cancer patients while taking the necessary precautions to maintain the safety of both patients and health-care professionals (HCPs). The present survey explores suggested modifications of inpatient oncology/hematology care during the COVID-19 pandemic. **Materials and Methods:** A web-based questionnaire using SurveyMonkey was distributed to HCPs taking care of inpatient hematology/oncology service including oncologists, hematologists, and inpatient nurses in Saudi Arabia. The 25 items selected for the survey focused on five domains including characteristics of HCPs, COVID-19 infection risk among admitted patients, possible modifications related to physicians/nursing practice, and suggested infection control measures. Clinical sensibility assessment was conducted to evaluate the comprehensiveness, clarity, and face validity of our instrument on a scale of 1–5. The percentages of HCP responses to the suggested modifications in the survey were assessed in descriptive statistics to summarize data and report views of participants. **Results:** Of 215 HCPs, 195 responded and completed the survey. Of the respondents, 30.4% were medical oncologists, whereas hematologists and nurses constituted 6.7% and 62.9% of the participants, respectively. The majority of respondents (87.6%) work in governmental hospitals. The majority of participants (82%) have diagnosed patients with COVID-19 in their hospitals and modifications in inpatient practice during the COVID-19 pandemic were supported by 95% of respondents. The supported modifications by participants include enhanced use of oral medications (83.5%), phone calls to admitted stable patients by physicians, instead of physical interview (77%), decreasing frequency of vital signs assessment in stable patients (91%), decreasing the duration of stay in patients rooms (89%), using peripheral instead of central lines (76%), using video-based educational materials to patients through hospital TV network (91%), testing for COVID -19 before scheduled radiology imaging and procedures (74%), and performing routine nasopharyngeal swabs for HCPs (67%). **Conclusion:** Several modifications in inpatient oncology/hematology practice were supported by the survey participants. These suggestions need to be discussed on local basis considering local infrastructure, available resources, and level of required care.

Key word: Health-care workers, COVID-19, cancer

BACKGROUND

In early 2020, the world started to suffer from the sudden outbreak of the novel coronavirus disease-2019 (COVID-19).

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Since then, there was an exponential growth in the number of patients presenting with COVID-19 worldwide.[1]

Despite the current burden on health-care facilities imposed by the COVID-19 pandemic, maintaining adequate care of cancer patients without compromising survival outcome is an important goal and therapeutic challenge. Meanwhile, keeping safety of patients and health-care professionals (HCPs) is of utmost importance.[2] However, providing the proper patient's care in inpatient departments in oncology/hematology services is especially challenging in the current era of the COVID-19 pandemic. Admitted cancer patients can be immune compromised and debilitated which makes them at particular risk for COVID-19-related complications.[3]

Nevertheless, certain modifications of medical and nursing management of admitted patients in oncology/hematology inpatient facilities may be required to maintain adequate patients' care while maintaining the safety of HCPs. Therefore, during the COVID-19 pandemic, the risk/ benefit ratio of different treatment approaches of inpatient care may need to be reconsidered.[4]

Several recommendations have been suggested by national and international medical and nursing societies to provide guides for patients' care during the COVID-19 pandemic. However, specific recommendations dedicated for inpatient oncology/hematology service are lacking. Different precautions related to nursing and physicians care in addition to infection control measures are needed to minimize the risk of transmission of infection among patients and HCPs.[4] In the current survey, we explored the views of different HCPs including oncologists, hematologists, and nurses on suggestions of possible modifications of inpatient oncology/hematology care during the current period of COVID-19 pandemic. These suggested modifications included physician and nursing-related practice in addition to infection control precautions.

MATERIALS AND METHODS

Study design/procedures

We used nonprobability snowball sampling.[5] A web-based questionnaire submitted to licensed HCPs taking care of inpatient hematology/oncology service including oncologists, hematologists, and inpatient nurses in Saudi Arabia. We contacted HCPs who are members of established national oncology/hematology societies in addition to nurses working in inpatient oncology/hematology services in Saudi Arabia, to participate and distribute the survey. Fellows and trainees were excluded. The survey was sent by WhatsApp to participants and reminders were sent weekly for three times and then data was collected via SurveyMonkey.

Development of the instrument

We generated our survey instrument using rigorous survey development and testing methods.[6] Items were selected based on literature review, emails, and telephone correspondence. Three experts in the field of oncology, hematology, and nursing from our institution extensively discussed the topic and reviewed items until no further questions were missed.

Items were nominated then ranked by expert HCPs to reach a consensus on selected items. Further review was performed to eliminate redundant items using binary responses (exclude and include).

During construction of the survey, items were grouped into domains we wanted to explore and then refined the questions.[7] The self-administered survey consisted of 25 items that focused on five domains: characteristics of HCPs, COVID-19 infection risk among admitted patients, possible modifications related to physicians' practice, possible modifications related to nursing practice and suggested infection control measures. Structured responses formats used in this survey included binary (yes/no), nominal and ordinal responses. Other options were also allowed such as "I don't know."

Respondents received electronic links accompanied with concise instructions then a cover letter stating the background, objectives of the survey, target population, and request to participate voluntarily. Their answers were kept anonymously using SurveyMonkey.

Testing of the instrument

During pretesting and pilot testing, questions were reviewed by three experts in oncology, hematology, and nursing to check for the consistency and appropriateness of the questions designed by investigators and then reviewed by a non-expert colleague to assess the dynamics, flow, and accessibility. Five HCPs carried out pilot testing of the instrument.

We also conducted clinical sensibility assessment to evaluate the comprehensiveness, clarity, and face validity of our instrument on a scale of 1–5.

We invited five colleagues with methodologic and oncology/hematology expertise. Results of the clinical sensibility testing using mean scores on 5-point scale suggested that the instrument had face validity (4.2), content validity (4.1), clarity (4.3), and discriminability (4.4).

We sent an embedded link to the web-based survey on SurveyMonkey along with electronic cover letter/instructions to complete the survey via WhatsApp after IRB approval to licensed oncologists/hematologists and inpatient nurses in Saudi Arabia.

Outcome assessment

We assessed the percentage of response of HCPs regarding to the suggested modifications in oncology/hematology inpatient practice. Descriptive statistics were used to summarize data and report views of participants.

RESULTS

The survey was distributed to 215 participants in Saudi Arabia. Of those, 195 responded and completed the survey. Of the respondents, 30.4% were medical oncologists, whereas hematologists and nurses constituted 6.7% and 62.9% of the participants, respectively. The majority of respondents (87.6%) work in governmental hospitals, 8.2% in academic institute, whereas only 2% works in private hospitals. Less than half, 46.2% of the participants have more than 10-year-work experience, 40% have 5–10 year-experience and 13.8% have less than 5-year-work experience [Figure 1]. 82% of the participants reported that they have COVID-19 diagnosed patients in their hospital, whereas 85% have HCPs diagnosed with COVID-19 infection.

The great majority agreed/strongly agreed that cancer patients are at increased risk of COVID-19 related complications and that the risk of these complications is different among cancer patients. About 70% of patients viewed that HCPs working in oncology/hematology inpatients departments are at increased risk of COVID-19 infection compared to those working in outpatient clinics [Figure 2]. Noteworthy, the great majority (95%) supported modifications in inpatient practice during COVID -19 pandemic [Table 1]. Similarly, the majority (83.5%) endorsed replacing intravenous (IV) with oral medications, whereas the respondents were split regarding the use of once daily compared to multi-dosed antibiotics in those without febrile neutropenia. The great majority (93%) promoted enhanced use of home health-care service for palliative care patients. More than three fourths (77%), preferred phone calls to admitted stable patients by physicians, instead of physical interview. In addition, two-thirds supported doing urgent procedures in negative pressure-rooms [Table 2].

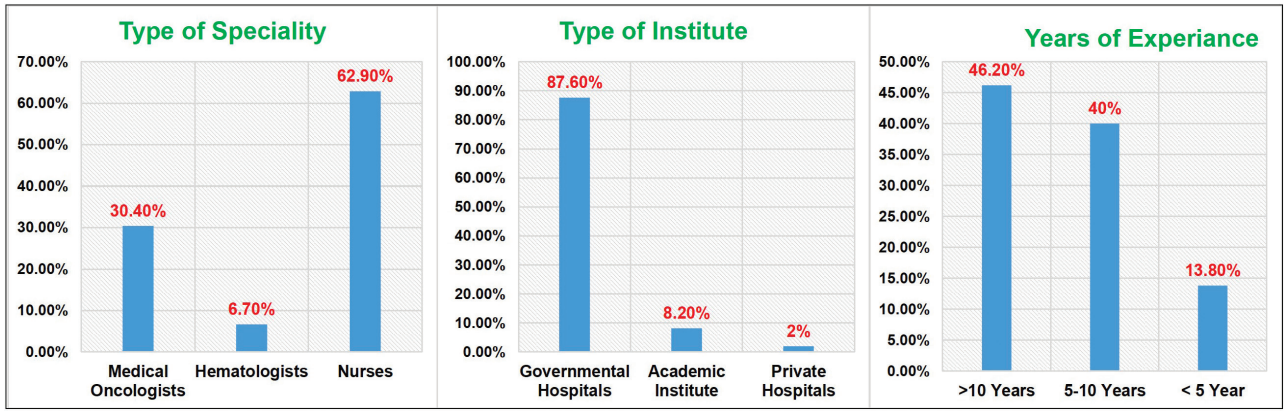

Figure 1: Participant's characteristics

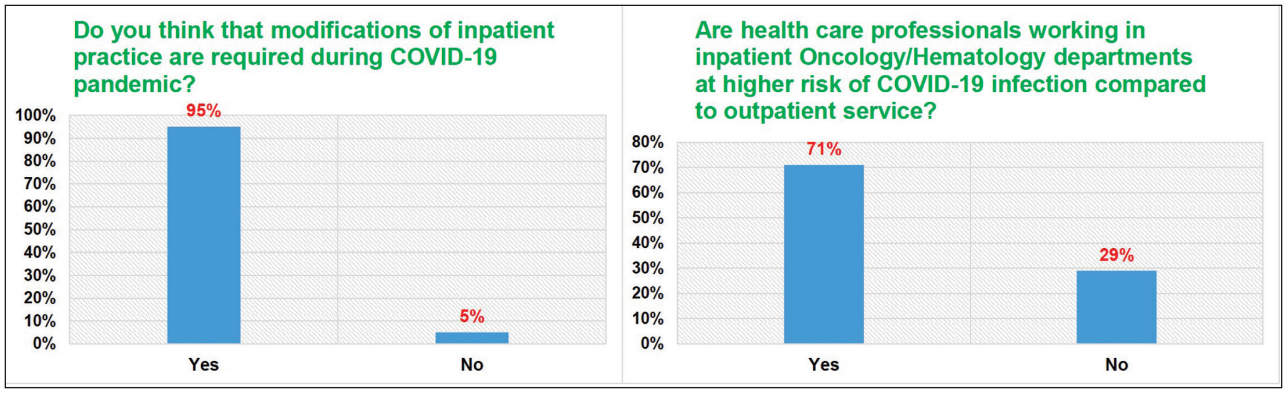

Figure 2: Participant's responses when asked about the modifications and risks of COVID-19

Table 2: Suggested modifications of inpatient physicians practice

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Can once daily replace multi-dosed antibiotics for patients without febrile neutropenia when convenient ?				
38 (19.79%)	65 (33.85%)	55 (28.65%)	29 (15.10%)	5 (2.60%)
Can interview with patients by phone calls replace physician physical visits to patient's room in stable patients?				
77 (39.69%)	73 (37.63%)	18 (9.28%)	21 (10.82%)	5 (2.58%)
Replacing IV medications with oral formulations as much as possible				
81 (41.75%)	81 (41.75%)	25 (12.89%)	4 (2.06%)	3 (1.55%)
Urgent procedures such as endoscopy for GI bleeding should be performed in negative pressure rooms?				
70 (36.08%)	61 (31.44%)	39 (20.10%)	20 (10.31%)	4 (2.06%)
Should we encourage use of home health-care service for palliative care patients instead of hospital admission?				
107 (54.87%)	75 (38.46%)	13 (6.67%)	0 (0.00%)	0 (0.00%)

Table 1: Risk of infection during COVID-19 pandemic

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Are cancer patients at increased COVID-19 infection- related complications such as respiratory failure?				
109 (56.48%)	71 (36.79%)	12 (6.22%)	1 (0.52%)	0 (0.00%)
Is the risk of serious complications of COVID-19 infection such as respiratory failure is different among cancer patients?				
71 (36.60%)	97 (50.00%)	22 (11.34%)	3 (1.55%)	1 (0.52%)
Are health-care professionals working in inpatient oncology/hematology departments at higher risk of COVID-19 infection compared to outpatient service?				
65 (33.33%)	74 (37.95%)	37 (18.97%)	19 (9.74%)	0 (0.00%)
Are practice modifications of inpatient practice required during COVID -19 pandemic?				
92 (47.42%)	92 (47.42%)	9 (4.64%)	1 (0.52%)	0 (0.00%)

Regarding nursing practice, the majority of respondents supported several modifications during COVID-19 pandemic such as synchronizing medication administration with vital signs assessment to decrease exposure with patients (84%), decreasing frequency of vital signs assessment in stable patients (91%), decreasing the duration of stay in patients rooms (89%), using peripheral instead of central lines (76%), checking patients by nurses using phone calls instead of nurses hourly round (73%), using video-based educational materials to patients through hospital TV network (91%), and electronic instead of physical handover (84%) [Table 3].

Furthermore, the majority of respondents supported infection control measures such as wearing surgical masks by patients during physicians' visits and nursing care (96%), testing for COVID-19 before scheduled radiology imaging and procedures (74%) and doing routine nasopharyngeal swab for cleaners (73%), whereas doing routine nasopharyngeal swab for HCPs was supported by (67%) of the respondents [Table 4].

DISCUSSION

This survey was conducted among HCPs in Saudi Arabia and explored the views of HCPs through possible modifications in three dimensions including general infection control measures in addition to physician and nursing practice. Admitted patients to wards with advanced solid tumors and hematological malignancies who are on active anti-cancer treatments or symptomatic are more likely to suffer from COVID-19 serious sequelae.[8] Close contact between patients and HCPs is required in many inpatient assessments and procedures, which increases the risk of transmission of COVID-19 infection.[9] This highlights the importance of the above-mentioned suggested modifications in inpatient practice.

In our survey, we showed that most of the respondents recommended modifications in inpatient practice in hematology/oncology wards to match the current limitations related to COVID-19 infection while maintaining the safety of both patients and HCPs. Several reports displayed that longer exposure to infected persons is correlated with increased risk of COVID-19 infection.[10] The results of our study showed that decreasing frequency and duration of contact between patients and HCPs was recommended by the majority which can be achieved through contacting patients by phone calls and using video-based educational materials. Noteworthy and consistent with our results, an International Collaborative Group reported that during COVID-19 telehealth can be used to decrease the frequency of hospital visits for stable patients,

Table 3: Suggested nursing practice modifications

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Can medication administration be synchronized with vital signs assessment to decrease exposure with patients?				
83 (42.78%)	81 (41.75%)	24 (12.37%)	6 (3.09%)	0 (0.00%)
Can peripheral lines be used if feasible instead of central lines?				
56 (28.72%)	93 (47.69%)	22 (11.28%)	21 (10.77%)	3 (1.54%)
Decreasing the frequency of vital signs assessment in stable patients				
104 (53.33%)	75 (38.46%)	6 (3.08%)	9 (4.62%)	1 (0.51%)
Decreasing Time of each entry to patient's room to < 10 min is preferred				
87 (44.62%)	88 (45.13%)	14 (7.18%)	3 (1.54%)	3 (1.54%)
Can checking patients by nurses using phone calls replace nursing hourly round ?				
64 (32.82%)	80 (41.03%)	23 (11.79%)	25 (12.82%)	3 (1.54%)
Video educational materials to patients provided through hospital TV channels can replace direct face to face education by medical team				
91 (46.91%)	87 (44.85%)	6 (3.09%)	10 (5.15%)	0 (0.00%)
Can handover by electronic media replace face to face handover?				
83 (42.78%)	81 (41.75%)	17 (8.76%)	12 (6.19%)	1 (0.52%)

Table 4: Suggested infection control modifications

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
All admitted patients must wear surgical mask during physicians /nurses care				
131 (67.53%)	56 (28.87%)	4 (2.06%)	2 (1.03%)	1 (0.52%)
Testing for COVID-19 before scheduled radiology imaging and procedures should be considered				
56 (28.87%)	88 (45.36%)	22 (11.34%)	26 (13.40%)	2 (1.03%)
Do you recommend nasopharyngeal swab for cleaners regularly?				
66 (34.02%)	77 (39.69%)	31 (15.98%)	18 (9.28%)	2 (1.03%)
Do you recommend nasopharyngeal swab for health-care professionals regularly?				
26 (13.47%)	104 (53.89%)	31 (16.06%)	26 (13.47%)	6 (3.11%)

on follow up or those on oral treatment.[11] Expanding this approach in some inpatient scenarios such as COVID-19 suspected/confirmed stable oncology patients, may be considered. Furthermore, decreasing the frequency of vital signs assessment in stable patients, using long acting and /or oral medications when appropriate can be a good strategy to decrease risk of infection transmission in the current era. In addition, avoiding procedures that need long and close contact with patients such as central line insertion that needs repeated prolonged care with close contact among patients and HCPs.

According to WHO recommendations, patients visiting health-care settings should not wear a medical mask when isolated in a single room, but should instead follow proper hygienic measures.[12] However, in many health facilities, patients are admitted in shared rooms (mostly 2 patients per room). Furthermore, the immune-compromised nature of oncology patients' needs to be considered carefully which may justify wearing a surgical mask by admitted oncology/hematology patients during interactions with HCPs.

In our survey, the majority of respondents endorsed doing routine COVID-19 testing among HCPs, admitted patients, cleaners, and among patients before doing radiological imaging/procedures, this is in keeping with CDC guidelines, testing of asymptomatic HCPs without known or suspected exposure to COVID-19 infection can be considered in special situations.[13] Subsequently, this may improve the outcomes of admitted patients to hematology and oncology wards. This practice can be a valid approach especially in services hosting highly immune-compromised patients such as those with acute leukemia and bone marrow transplant units.[14] Furthermore, cleaners in some health institutes

live in shared residency places.[15] This may highlight the importance of extra-precautionary measures when appropriate such as regular COVID-19 testing in addition to housing spacing and rigorous measures for proper health and hand hygiene.

In keeping with the American College of Surgeons endorsed precautionary measures for infected or suspected patients while doing aerosol-generating procedures including intubation/extubation, bronchoscopy, and laparoscopy/endoscopy, our survey showed that the majority of respondents supported doing urgent procedures in negative pressure-rooms and doing COVID-19 testing before doing imaging or invasive procedures. These measures include wearing full personal protective equipment, including an N95 mask or powered, air-purifying respirator (PAPR) designed for the operating room.[16]

Our survey has several strengths such as it was conducted using rigorous methodology and explored views of HCPs dealing with vulnerable patients. We also have several limitations that include, the nature of the web-based survey, small sample size, as we did not know the total number of this population however we tried to invite more participants using snowball sampling. In addition, it was conducted in Saudi Arabia only, which may not reflect current practice in different countries. Lastly, some of the suggested modifications need infrastructure that may not be available in all health facilities such as video-based educational materials and local hospital TV networks.

Our study adds to the previous knowledge that from HCPs views, admitted patients with cancer need to be managed with some modifications that are consistent with the evolving literature and implement new effective strategies such as videoconference tools, rigorous precautionary measures such as testing for COVID-19 and treatment modifications such as changing the route to oral treatment. This would help with the reduction of COVID-19 transmission among patients and HCPs and ensure continuity of cancer care with better quality.

Many questions remain to be addressed concerning these modifications. Advocating for such modifications is subject to local health-care policies, prevalence of infection in the community, and heath-care facilities and ultimately provided that these resources and logistics are available and feasible. Another unanswered question remains is the implications of cost and the presence of adequate infrastructures as it is clearly not similar in all institutions. Finally, an important unanswered question is how to adopt specific guidelines in the midst of pandemic as the recommendations can continuously change such as the mode of COVID-19 transmission, need to wear mask all times, re-infection, vaccination and so on. These are possible avenues for future research to understand how these modifications translate into a better quality of care for admitted patients with cancer

Finally, these suggestions need to be discussed on local basis and ensure the quality of inpatient service frequently monitored during COVID-19 pandemic to maintain the desired level of care to oncology/hematology patients without compromising the safety of HCPs

CONCLUSION

Several modifications in inpatient oncology/hematology practice were supported by the survey participants which could be applied during infectious outbreaks. These suggestions need to be discussed on local basis considering local infrastructure, available resources, and level of required care to ensure continuity of delivering high quality of care to patients with cancer.

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Conflicts of interest

There are no conflicts of interest.

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