

Appropriateness of the Emergency Referrals Made by Primary Care Clinicians

A cross-sectional review of referral notes

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ABSTRACT: Objectives: This study aimed to evaluate the appropriateness of the emergency referrals made by primary care clinicians and determine the factors contributing to inappropriate referrals. **Methods:** This cross-sectional study utilises referral notes review between October 2019 and March 2020. Patients referred to Khawla Hospital's emergency department by a primary care clinician in Muscat Governorate were randomly selected; their referral notes were reviewed by five family physicians. The appropriateness of the referrals was evaluated according to the primary care referral protocol. Any referral that deviated from the protocol was classified as inappropriate. The prevalence and characteristics of inappropriate referrals were identified, and the factors contributing to inappropriate referral were determined using multivariable logistic regression. **Results:** In total, 591 referrals were reviewed; 354 (59.9%) of them were classified as inappropriate due to inadequate medical notes (291, 82.2%), lack of provisional diagnosis (176, 49.7%), misdirected to a non-concerned emergency (30, 8.4%) or misclassification of urgency (107 [30.2%] were classified as urgent and 45 [12.7%] as routine). After adjusting for multiple variables, insufficient clinical notes, unavailability of referral guidelines and lack of expertise were found to be strong determinants of inappropriate referral, with an odds ratio of 62.52 (95% confidence interval [CI]: 32.04–121.96), 2.88 (95% CI: 1.40–5.92) and 9.37 (95% CI: 4.09–21.43), respectively. **Conclusion:** While most of the referrals required emergency management, the majority were inappropriate, mainly due to insufficient clinical documentation. Inadequate clinical notes and lack of national guidelines and expertise were found to be strong predictors of inappropriate emergency referrals.

Keywords: Referral and Consultation; Emergencies; Primary Care; Physicians; Documentation; Records; Guidelines.

ADVANCES IN KNOWLEDGE

- The appropriateness of emergency referrals made by primary care institutes is not only dependant on the urgency of the health condition, but also on the adequacy of information documented in the referral sheet and directing patients to the concern emergency department.
- Inadequate documentation contributed to most referrals that were labelled as inappropriate.
- Lack of clinical guidelines and expertise and incomplete medical notes were strong predictors for inappropriate referrals.

APPLICATIONS TO PATIENT CARE

- The findings of this study will prompt strategies for mitigating inappropriate referral and help improve referral practices from primary healthcare to emergency departments, enhancing patient care, satisfaction and outcome, especially for patients with acute illnesses.

REDUCING THE FREQUENCY OF INAPPROPRIATE referrals to emergency departments (EDs) has long been a healthcare issue for healthcare planners and policy makers.^{1,2} There is a significant increase in hospital emergency visits globally, especially in high-income countries, where the proportion of non-urgent cases visiting emergency care is estimated to range between 20–40%, annually.^{1,3} This results in overcrowding and the overutilisation of emergency services, affecting the quality of care and increasing cost and unnecessary expenditure.^{4–6} Therefore, an attempt to identify inappropriate referrals and non-emergency cases is essential to alleviate the burden on emergency services.

The definition of inappropriate referrals is diverse and might vary across health institutions and practices, and there are no valid methods or standardised categorisation to determine appropriateness of referrals.^{7–11} However, various healthcare systems consider the urgency of a health condition as an important aspect of ensuring the need for emergency care, which is not the case if resources and expertise are available in a primary care facility. Most organisations that provide primary healthcare (PHC) determine the appropriateness of referrals according to the level of urgency/emergency of the health condition, the clinical evaluation notes in the referral document and whether the referral is made to the correct health facility.^{12,13}

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Self-referral has been considered a major factor contributing to inappropriate referrals and emergency services overcrowding. A cross-sectional study on the characteristics of non-urgent patients and barriers to seeking primary care instead of ED care found that more than 20% of patients thought their condition was urgent and 7% trusted ED care over other outpatient services.¹⁴

In Muscat Governorate, the capital city of Oman, most referrals to EDs are made by primary care clinicians, according to the Ministry of Health Protocol and Policies, which stipulates that emergency referrals must be made through PHCs or ambulance services rather than by oneself.^{15,16} This referral system was established in 2002 to help alleviate the overcrowding and overutilisation of emergency services in the country, as well as evaluate and determine the emergency and life-threatening cases that require ED services.¹⁷ This policy placed the responsibility of improving and maintaining the quality of emergency referrals and of ensuring that patients are correctly identified for emergency care on PHC clinicians. It has been reported globally that despite the implementation of referral systems, ED overutilisation still persists and contributes to the high healthcare cost.^{18–20}

The Directorate of Primary Health Care of Muscat Governorate, in its attempt to improve the quality of referrals and reduce instances of non-urgent cases being referred to EDs, initiated an auditing program in 2016 to monitor inappropriate emergency referrals regularly and has taken various steps to improve the quality of care. Moreover, the following criteria were established to ensure appropriate referrals: 1) classification of the type of referral into emergency, urgency or routine, according to the condition's severity; 2) referral to concerned EDs; 3) clear documentation of the patient's history, physical assessment findings and management given; and 4) stating a provisional diagnosis.²¹

Several health conditions, ranging from routine to acute emergencies, are treated in PHCs. The referral of acute conditions is a complex process involving consideration of the location of the referring PHC and the availability of the required services in the receiving ED; moreover, a clear pathway for referring urgent cases and national guidelines for the treatment of some acute conditions (e.g., management of severe low back pain not responding to conventional treatment and incision and drainage for abscesses) are lacking.

To the authors' knowledge, no study has evaluated the appropriateness of referrals made to the EDs from the primary care perspective and explored primary care clinicians' practice. The current study aimed to provide comprehensive evidence about the

quality of emergency referrals made from Muscat PHC centres and determine the factors contributing to inappropriate referrals.

Methods

This cross-sectional study involved PHC patients who were referred to Khawla Hospital, Muscat, Oman, between October 2019 and March 2020. Patients' referral information was retrieved retrospectively using anonymised, routinely collected data from the 'Al Shifa' database.²²

Khawla Hospital is a trauma centre in Muscat Governorate with various specialised medical departments, including emergency, surgical, orthopaedic, neuroscience, rehabilitation, obstetrics and gynaecology departments. Approximately, 70,000–75,000 patients visit Khawla Hospital's ED annually, presenting with different acute health conditions, such as trauma, burns and neurological and surgical complaints. Patients access Khawla Hospital's ED through primary care, self-referral, outpatient services, ambulance services, other regional hospitals and private health institutes.²³

Patients who were referred by primary care clinicians to Khawla ED between October 2019 and March 2020 were randomly selected. Patients who were referred to the obstetrics and gynaecology emergency and those whose referral documents could not be accessed were excluded.

The sample size was calculated by identifying the total number of eligible patients referred from PHC centres to Khawla Hospital's ED between October 2019 and March 2020, totalling 5,652. A recent audit conducted by the Khawla Hospital ED team reported that 33–45% of the referrals made by PHC were unjustified. Based on this data, the sample size was calculated at 357, with a study power of 80% and 95% confidence level. Calculation was done using a Select Statistics UK calculator (<https://select-statistics.co.uk/calculators/>). A total sample size of 591 was chosen to allow for sub-group analyses based on age, gender and referral appropriateness as well as for dropouts after applying the exclusion criteria.

The authors reviewed and evaluated all referrals for their adherence to the PHC referral protocol. They also identified the patients' characteristics and certain pre-specified factors that are expected to determine referral appropriateness, including the specialty of the referring clinician, time of duty during referral, day of duty during referral, lack of resources, availability of referral guidelines and patients' age, sex and comorbidity. These referrals were retrieved from the external referral folio in the Al Shifa database. Patients

were identified through their medical record number in Khawla hospital and their civil numbers were used to recover the referral notes made by primary care physicians.

According to the PHC protocol, a referral is considered inappropriate if: 1) the health condition is incorrectly identified as an emergency, 2) the patient is incorrectly directed to Khawla hospital's ED, 3) the relevant history and physical examination are incomplete; or 4) a provisional diagnosis is lacking.²¹ This protocol was constructed based on PHC and ED expert consensus and disseminated within PHC facilities in Muscat Governorate to regulate referral practice. It is utilised regularly to internally audit referrals from each PHC institute. The authors used the presence of any of these elements to classify a referral as inappropriate.

The urgency/emergency status of a referral was determined according to the severity of the presenting acute complaint recorded in the clinical notes. Acute complaint was categorised into musculoskeletal (MSK) injury, laceration and wounds, skin abscess and swelling, neurological complaints, burns, acute abdomen, other MSK conditions, other medical complain and other traumatic injuries.

The factors expected to predict inappropriate referral were prespecified and grouped in either binary or categories. These factors included patient's

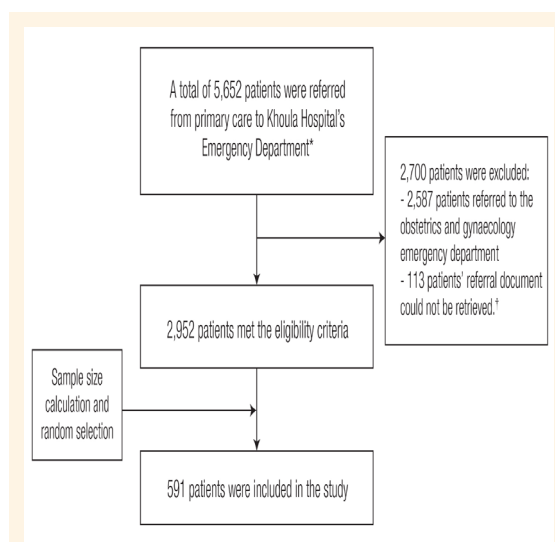


Figure 1: Flow chart of the study population selection

*During the period between October 2019 and March 2020.

†Patients' serial numbers were not available and referral documents could not be identified.

age, gender and comorbidity (not documented, present or absent), referring clinician speciality (medical officer or family physician), duty shift (morning, evening or weekend), day of week of referral (weekdays or weekends), unavailability of resources (imaging, therapeutics, expertise or delay in urgent appointments) and availability of referral guidelines (not aware, yes, no).

Table 1: Patients' characteristics according to referral appropriateness* (N = 591)

	n (%)		P Value
	Inappropriate† (n = 354)	Appropriate (n = 237)	Total (N = 591)
Median age in years (IQR)	21.5 (9–40)	17 (6–35)	-
Age in groups			0.343
<12 months	2 (0.56)	2 (0.84)	4 (0.67)
12 months to 18 years	164 (46.33)	124 (52.32)	288 (48.73)
>18 to <35 years	71 (20.06)	50 (21.10)	121 (20.47)
35 to <60 years	84 (23.73)	40 (16.88)	124 (20.98)
≥60 years	33 (9.32)	21 (8.86)	54 (9.13)
Gender			0.433
Male	219 (61.86)	139 (58.65)	358 (60.57)
Female	135 (38.14)	98 (41.35)	233 (39.43)
Comorbid disease			<0.001
Present	77 (21.75)	43 (18.14)	120 (20.30)
Absent	175 (49.44)	164 (69.20)	339 (57.36)
Not documented	102 (28.81)	30 (12.66)	132 (22.34)

IQR = interquartile range.

*Referrals were classified as appropriate or inappropriate based on the primary care referral protocol

†Referral is considered inappropriate if it is incorrectly classified as an emergency, not referred to the correct emergency subspeciality, there is insufficient documentation of relevant history and physical examination and the referral note lacks a provisional diagnosis.

Table 2: Referral appropriateness based on reasons applicable to the primary healthcare referral protocol (N = 591).

	n (%)			P Value
	Inappropriate* (n = 354)	Appropriate (n = 237)	Total (N = 591)	
Clinical condition				0.002
MSK injury	180 (50.85)	101 (42.62)	281 (47.54)	
Lacerations and wounds	62 (17.51)	53 (22.36)	115 (19.46)	
Skin abscesses and swellings	36 (10.17)	28 (11.81)	64 (10.83)	
Neurological complains	19 (5.37)	21 (8.86)	40 (6.77)	
Other traumatic injuries	18 (5.08)	12 (5.06)	30 (5.07)	
Acute abdomen	6 (1.69)	12 (5.06)	18 (3.04)	
Other MSK conditions	16 (4.52)	1 (0.42)	17 (2.87)	
Other medical complains	13 (3.67)	3 (1.27)	16 (2.71)	
Burns	4 (1.13)	6 (2.53)	10 (1.69)	
Referral type				<0.001
Emergency	202 (57.06)	213 (89.87)	415 (70.22)	
Urgency	107 (30.23)	23 (9.70)	130 (22.00)	
Routine	45 (12.71)	1 (0.42)	46 (7.78)	
Directed to the concerned subspecialty				<0.001
Yes [†]	324 (91.53)	237 (100.00)	561 (94.92)	
No	30 (8.47)	0 (0.00)	30 (5.07)	
History and physical assessment documentation				<0.001
Comprehensive [†]	63 (17.80)	213 (89.87)	276 (46.70)	
Incomprehensive	291 (82.20)	24 (10.13)	315 (53.30)	
Provisional diagnosis documented				<0.001
Yes [†]	178 (50.28)	205 (86.50)	383 (64.80)	
No	176 (49.72)	32 (13.50)	208 (35.20)	

MSK = musculoskeletal

*A referral was considered inappropriate if incorrectly classified as an emergency, not referred to the correct emergency subspecialty, there is insufficient documentation of the relevant history and physical examination and it lacks a provisional diagnosis.

[†]MSK

The overall referral appropriateness was stratified according to patients' baseline characteristics, the PHC referral protocol and determining factors using descriptive analysis. Mean with standard deviation (SD) and median with interquartile range (IQR) were used to summarise symmetrical and non-symmetrical continuous data, respectively. Counts and percentages were used for categorical data. Crude associations between appropriateness and exposure variables were preliminarily evaluated using the Chi-squared or Wilcoxon test. To evaluate the association between referral appropriateness and patient-healthcare factors, odds ratios (ORs), with 95% confidence interval (95% CI) and P value, were calculated using logistic regression.²⁴ Confounding factors were kept

in the multivariate model when associated with the outcome at a significance level <20%. STATA, version 17 (StataCorp LLC, Texas, USA) was used for analysis.

The study proposal was approved by the Regional Committee of Ethics and Research Approval of the Directorate of Planning and Studies of Muscat Governorate (MH/DGHS/ DPT/21/24962).

Results

This study included the referral documents of 591 patients referred to Khawla hospital's ED between October 2019 and March 2021. The patient flow chart from the original source, after exclusion and random selection to form the eligible study cohort, is shown

Table 3: Patient-healthcare factors according to referral appropriateness (N = 591)

	n (%)			P Value
	Inappropriate (n =354)	Appropriate (n = 237)	Total (N =591)	
Comorbid disease				<0.001
Absent	175 (49.44)	164 (69.20)	339 (57.36)	
Not documented	102 (28.81)	30 (12.66)	132 (22.33)	
Present	77 (21.75)	43 (18.14)	120 (20.30)	
Specialty of referring clinician				0.037
General practitioner	347 (98.02)	225 (94.94)	572 (96.78)	
Family physician	7 (1.98)	12 (5.06)	19 (3.21)	
Day of referral				0.823
Weekend	44 (12.43)	28 (11.81)	72 (12.18)	
Weekday	310 (87.57)	209 (88.19)	519 (87.82)	
Time of referral				0.286
Morning	204 (57.63)	147 (62.03)	351 (59.39)	
Evening	150 (42.37)	90 (37.97)	240 (40.61)	
Availability of referral guidelines				0.024
Yes	136 (38.42)	118 (49.79)	254 (42.98)	
No	153 (43.22)	84 (35.44)	237 (40.10)	
Not aware	65 (18.36)	35 (14.77)	100 (16.92)	
Lack of resources in primary care				<0.001
Therapeutics	30 (8.47)	14 (5.91)	44 (7.44)	
Expertise	73 (20.62)	17 (7.17)	90 (15.23)	
Delay in urgent appointment	30 (8.47)	16 (6.75)	46 (7.78)	
Emergency cases regardless of lack of resources	221 (62.43)	190 (80.17)	411 (69.54)	

in Figure 1. In total, 358 (60.57%) of the patients were males and the median age was 19 years, with an IQR of 7–39 years [Table 1].

Most (n = 228, 48.73%) of the referred patients were children aged between 1 and 18 years, followed by middle-aged and young adults (n = 124 [21.00%] and n = 121 [20.47%], respectively); 339 (57.36%) of the referral notes had informed on the absence of comorbid disease at time of patient referral, while 132 (22.33%) did not have the patients' comorbid status documented [Table 1].

Table 2 shows the frequency of referral appropriateness according to the PHC referral criteria. The most common clinical condition referred to emergency care was MSK injury (n = 281, 47.55%), followed by lacerations and wound (n = 115, 19.46%) and skin abscess or other swellings (n = 64, 10.83%). Burns and medical complaints were the least referred (n = 10, 1.69% and n = 16, 2.71%, respectively).

According to the reviewers' judgment, 415 (70.22%) cases were genuine emergency conditions, 130 (22.00%) were urgent and 46 (7.78%) were routine. Moreover, 30 (5.1%) patients were directed to the wrong ED, and the acute care required was not available in Khawla hospital; 188 (31.81%) referrals were made due to lack of imaging, 178 (30.12%) were due to lack of expertise, 132 (22.34%) were due to lack of therapeutics and 49 (8.29%) were due to delays in attending to urgent cases.

Provisional diagnosis was not documented in 208 (35.19%) referral notes, and a detailed history and examination was lacking in 315 (53.30%) referral notes. Evidence suggests a variation in the characteristics of inappropriate and appropriate referrals (P value <0.05).

A total of 354 (59.90%) referrals were considered inappropriate; 152 (42.93%) of these were considered inappropriate because urgent cases were mislabelled as emergencies, 30 (8.47%) were directed to the

Table 4: Multivariable logistic regression* analysis to assess the factors associated with referral appropriateness (n = 354)

Inappropriate Referral	Odds Ratio	SE	Z	P> z	95% CI
Male versus female	1.15	0.33	0.48	0.629	0.65–2.04
Age groups					
1–18 years (reference)	6.01	15.67	0.69	0.492	0.04–999.33
>18 and <35 years	5.15	13.49	0.63	0.531	0.03–872.79
35 to <60 years	11.45	29.97	0.93	0.352	0.07–1936.19
≥60 years	5.89	15.72	0.67	0.506	0.03–1098.01
Comorbid disease					
Not documented	1.06	0.41	0.15	0.880	0.50–2.27
Present (reference)	1.23	0.65	0.79	0.432	0.59–3.49
GP versus family physician	1.02	0.77	0.03	0.976	0.23–4.49
Working day versus weekend	1.46	0.66	0.83	0.408	0.60–3.55
Morning vs evening	1.10	0.34	0.32	0.752	0.60–2.01
Availability of national referral guidelines					
Not aware	3.10	1.35	2.60	0.009	1.32–7.28
No	2.88	1.06	2.87	0.004	1.40–5.92
Clinical notes incomplete versus complete	62.52	21.31	12.13	0.000	32.04–121.96
Acute clinical condition					
Other MSK conditions [†] (reference)	2.52	3.76	0.62	0.536	0.13–46.92
Burns	0.35	0.47	–0.78	0.435	0.03–4.83
Acute abdomen	0.08	0.10	–2.04	0.041	0.01–0.91
Other forms of traumatic injuries	0.51	0.52	–0.66	0.512	0.07–3.82
Skin abscess and swelling	0.45	0.43	–0.84	0.403	0.07–2.92
Neurological complain	0.33	0.34	–1.08	0.282	0.04–2.48
Laceration and wounds	0.48	0.45	–0.78	0.438	0.07–3.01
MSK injuries	0.62	0.55	–0.53	0.598	0.11–3.61
Lack of resources					
Imaging (reference)	1.50	0.79	0.77	0.439	0.53–4.23
Therapeutics	2.42	1.35	1.58	0.114	0.81–7.21
Expertise	9.37	3.95	5.30	0.000	4.09–21.43
Delay in urgent appointment	1.09	0.61	0.16	0.873	0.36–3.28
_Cons	0.01	0.02	–1.57	0.117	0.01–3.40

SE = standard error; CI = confidence interval; GP = general practitioner; MSK = musculoskeletal.

*Factors included in this analysis were sex, age groups, presence or absence of comorbid disease, referring clinician, day of referral, time of referral, absence or presence of national referral guidelines, completeness of clinical notes, acute clinical condition, and availability of resources.

[†]Musculoskeletal complaints not related to injury or trauma.

Note: _cons estimate baseline odds.

Number of obs = 591

wrong ED, 291 (82.20%) lacked comprehensive notes on relevant history and physical examination, and 176 (49.72%) did not have a provisional diagnosis documented. Among these inappropriate referrals,

only 202 (57.06%) were identified as real emergency cases by the reviewers.

The median age of patients whose referral was classified as inappropriate was 21.5 (IQR: 9–40) years;

219 (61.9%) of them were male, and 164 (46.3%) were children aged between 12 months and 18 years. Approximately 50% of them did not have any comorbid disease. Most ($n = 180$, 50.85%) cases of inappropriate referral were MSK injuries, followed by laceration and wound ($n = 62$, 17.51%) and skin abscesses or other swellings ($n = 36$, 10.17%) [Table 2].

Among patients with inappropriate referrals, 50% had no chronic disease, 21.8% had comorbidities, and 28.8% had no clear documentation of comorbid disease status ($P < 0.001$). Most of the inappropriate referrals were made by general practitioners (98%), on weekdays (87.6%) and during morning shifts (57.6%), with P values of 0.037, 0.823 and 0.286, respectively.

The frequency of patient-healthcare factors by referral appropriateness, with P values, is shown in Table 3.

Multivariable logistic regression showed a strong association of inadequate clinical documentation, unavailability of national referral guideline and lack of expertise with inappropriate referral (OR = 62.52 [95% CI: 32.04–121.96]; $P < 0.001$, 2.88 [1.40–5.92], < 0.001 , 9.37 [4.09–21.43] and 0.004, respectively), after adjusting for patients' gender and age, presence of comorbid disease, clinical condition, referring clinician, day of referral and time of referral [Table 4].

Discussion

In this study, the referral documents of 591 patients referred from PHC centres to Khawla hospital's ED were assessed for quality and appropriateness. More than 60% of the referred patients were male and approximately 50% were children aged between 1–18 years. Assessment of the referrals' adherence to the primary care referral guidelines determined 354 (60%) as inappropriate because 107 (30.2%) of the referrals required urgent care (within one week) and not emergency care, 45 (12.7%) required routine care, 30 (8.5%) were misdirected to Khawla Hospital, 291 (82%) did not contain sufficient clinical information and 176 (50%) did not have a provisional diagnosis. Most of the referred cases had MSK injuries. Univariable analysis suggested an association between inappropriate referral and pre-specified predictors, including referring doctor's specialty and time and day of referral; however, after adjusting for certain factors, multivariable analysis showed strong evidence of an association of insufficient documentation and lack of referral guideline and expertise with inappropriate referral.

Most pre-existing studies evaluated the appropriateness of emergency referrals—which were mostly self-referrals—according to ED protocols and not from the primary care perspective.^{25,26} However,

a few studies have evaluated referrals made by primary care physicians. Sempere *et al.* reviewed the referral notes of 2,980 adult patients visiting the ED of Elche hospital and found that 29.6% of them were inappropriate, of which 16.1% were made by primary care physicians.²⁷ Another study found 24.2% of referrals to EDs to be inappropriate according to its Hospital Urgencies Appropriateness Protocol and that the determinant of inappropriate use concerned factors related to the patients—such as age—rather than the healthcare system.²⁸ In this study, a large proportion of referral was considered inappropriate even though 60% of them were identified as real emergencies. This is attributed to the insufficient documentation of clinical information in the referral notes. Thus, the prevalence of inappropriate referrals, from the perspective of primary care in Muscat Governorate, can be attributed to deficiency of clinical notes and not to acute illness severity.

Unlike the current study's findings, a Spanish study that considered 600 referrals to an ED found a good level of relevant clinical notes documentation, with 96.2% of the referrals containing information about the patient's medical history, 89.8% containing details about physical examination and 66.2% having a provisional diagnosis.²⁹ The low rate of provisional diagnosis documentation in the current study might be due to primary care clinicians' uncertainty about the acute illness' differential diagnosis, as well as the unfeasibility of selecting a consistent diagnosis in the Al Shifa database through International Classification of Diseases (ICD) coding, which is also used for disease identification at the primary care level, despite being originally created for inpatient disease classification in hospitals. Therefore, to improve provisional diagnosis documentation, it is important to evaluate the applicability and limitations of the ICD codes at the primary care level in Muscat Governorate. The reasons for insufficient documentation were not extensively examined; however, a survey assessing ED physicians' perceptions of referrals attributed poor clinical notes to high workload and excessive sheets to fill in on the electronic medical record, suggesting that to improve documentation, positive recognition and financial rewards should be provided.³⁰

The current study showed that 30% of the referred cases did not require emergency care: 22% were classified as urgent conditions and 8% as routine. This is comparable to the emergency services demand in Australia, where 29% of patients with non-urgent conditions were referred by a healthcare provider to a regional Tasmanian ED.²⁸ The Spanish healthcare system tried to overcome non-emergency referrals by establishing a hospital-based quick diagnostic unit that evaluates and provides care for patients identified as

urgent, who present with serious medical complaints but are otherwise clinically stable; despite this effort, it was found that 90% of the patients being referred to the emergency facility could have been directly referred to the quick diagnostic unit.²⁷

MSK injuries were at the top of the list of health conditions referred to the Khawla hospital ED, 50%. In the USA, MSK injuries comprise 20% of cases referred to EDs annually.³¹ Unlike the current study's findings, a study found trauma, wound and knocks to be the most common diagnosis made for cases referred to EDs in Spain.²⁷ This study found that more than half of the MSK injuries were among children aged between 1–18 years, which indicates the importance of establishing effective preventive measures to minimise morbidity and mortality among this vulnerable population. Several community-based injury prevention programmes, including counselling and routine physical stretching, were found to be effective in reducing the incidence of MSK-related injuries among children and young adults.³¹

The strength of this study lies in its assessment of referrals made at the primary care level, which is where most referrals to the ED come from in Oman. This study evaluated the quality of emergency referrals at the primary care level, where evidence is lacking. Patients of all age groups, with various comorbid diseases were included in this study to ensure generalisability of the results. The main limitation of this study is the lack of information about the reasons GPs referred some non-urgent and routine cases as emergencies. It is not known whether the patients were referred due to a lack of the resources required to provide care for them. There may be a good clinical reason for emergency referrals; however, this does not change the current study's finding that these specific cases did not require emergency care.

This study has several implications; first, the findings may help to pinpoint the factors associated with inappropriate referral. The findings indicate the importance of having a comprehensive referral protocol in the primary care setting that takes into account the urgency of an acute illness and the pathway of referral to hospitals' EDs with regard to disease severity, treatment modalities, diagnostic intensity and patient outcome. A standard, user-friendly format for clinical notes documentation in the Al Shifa medical database is required to enhance the comprehensive recording of patients' relevant information.

Further studies are needed to identify the reasons medical officers refer non-emergency cases to EDs and explore how patients perceive the services provided after their referral to the ED in Oman. It is also essential to evaluate the appropriateness and

outcomes of the emergency referrals made by primary care clinicians from the perspective of emergency physicians in order to arrive at a consensus regarding emergency referrals and hence improve patient care and healthcare services.

Conclusion

While most of the referrals made by primary care clinicians required emergency care, majority were identified as inappropriate, due mainly to insufficient clinical documentation. MSK injury was the most referred acute condition. Inadequate clinical notes and lack of national guidelines and expertise were found to be strong predictors of inappropriate emergency referrals.

AUTHORS' CONTRIBUTION

This research was conceptualised by HA and further developed by TH and NJ. HA set the objectives of this study and supervised the overall project. TH and NJ conducted a literature review on the topic. All authors contributed to revising, amending and approving the research proposal drafted by TH. Data collection and entry was performed by all authors. Data management and analysis was conducted by TH, who also drafted the manuscript. The whole team participated equally in revising and amending the manuscript. All authors read and approved the final version of the manuscript.

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CONFLICTS OF INTEREST

The authors declare no conflict of interests.

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