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Clinical profile and care pathways among unaccompanied minor asylum seekers in Vaud, Switzerland

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Abstract:
Objectives: The objectives of this study were to describe the overall clinical profile (somatic and psychological health) and the care pathways of unaccompanied minor asylum seekers (UMAS) who arrived in the Swiss canton of Vaud in 2015.
Methods: This was a retrospective study based on information extracted from the medical files of 109 patients over 1 year of follow-up. All the reasons for consultation and referrals as well as the diagnoses made were noted and coded using ICD-10. The healthcare providers for all diagnoses and referrals were also noted.
Results: Our sample was predominantly male (87.2%) and hailed primarily from Eritrea (39.4%) and Afghanistan (32.1%). Gatekeeping nurses at a specialized migrant care facility (MCF) referred 67.7% of the UMAS to other providers for further medical care, including 45.4% to the Interdisciplinary Division for Adolescent Health (DISA). However, 46.8% of the 109 UMAS also sought care at other structures without any referral by MCF or DISA as intended. Of the patients 39.4% were found to have at least one mental health problem, mainly functional disorders (21.1%), symptoms and episodes of depression (17.4%), symptoms of post-traumatic stress disorder (PTSD) (13.8%) and sleeping disorders (12.8%). The most common diagnoses of infectious diseases included community-acquired respiratory infections (43.1%), scabies (20.2%) and cases of skin abscesses and furuncles (13.8%). In fewer instances, cases of active tuberculosis (3.7%), chronic hepatitis B (2.8%), intestinal parasites (1.8%) and gastritis caused by *Helicobacter pylori* (1.8%) were also diagnosed. A significant proportion of UMAS presented traumatological (30.3%) and ophthalmological (25.7%) problems. Among the female UMAS (12.8% of the sample), evidence of genital mutilation (21.4%), pregnancy (21.4%) and abortion (14.3%) was common.
Conclusions: An integrated approach involving efficient coordination between different providers is necessary in order to respond adequately to the major healthcare needs of UMAS. Special attention should be paid to mental health.

Keywords: adolescents, asylum seekers, clinical profile, gatekeeping, infections, mental health, services use
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Introduction

Nearly 90,000 unaccompanied minor asylum seekers (UMAS) were registered in the member countries of the Schengen area in 2015, compared to only 13,000 in 2013 [1]. In Switzerland, applications for asylum from UMAS increased from 346 in 2013 [2] to 2700 in 2015 before falling back down to 401 in 2018 [3].

In various studies, mental health problems were particularly common among minor asylum seekers and refugees [4], [5], [6]. Unaccompanied minors – a segment of this already vulnerable population – have been identified in many comparative studies as being at even greater risk [7], [8]. A systematic review showed the

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prevalence of post-traumatic stress disorder (PTSD) symptoms occurring in 19–54% of UMAS and depression symptoms in 3–30% [4].

In terms of physical health, multiple studies involving systematic screenings for infectious diseases [9], [10], [11] showed an elevated prevalence of infections and infestations among UMAS. Specifically, these studies showed that 35.8–58.8% of UMAS suffered from at least one infection and that 19.6–29.2% suffered from at least one parasitic disease. Individuals from sub-Saharan Africa (SSA) were the most frequently affected with 86.7% and 71.6% of them having an infection and 46.7% and 43.3% having a parasitic disease as found in [10] and [11], respectively. The most commonly diagnosed infections or infestations were gastritis caused by *Helicobacter pylori*, schistosomiasis (affecting as much as 27.6% of individuals from SSA [11]), helminthiasis, giardiasis and amoebiasis.

As for healthcare services use, a systematic review [12] found consensus on a wide range of significant healthcare needs among asylum seekers. However, their findings on the extent to which healthcare resources are actually used differ – i.e. some studies show a higher level of services use, while others show a lower level in comparison to the host country's population. Common obstacles to the rational use of health resources were fragmented and uncoordinated care across different healthcare structures and a lack of understanding of how the healthcare system works.

As a model for migrant health, the use of gatekeeping nurses is a means of centralizing care and easing pressure on the rest of the healthcare system [13], [14], [15], although its financial impact has not been evaluated. The Swiss canton of Vaud evaluated the use of gatekeeping nurse practitioners for the care of adult asylum seekers (aged 17 and older) and concluded that it was an appropriate and effective model with similar access to treatment compared to physicians [16]. Thus, this gatekeeping system has been adopted for all asylum seekers in the canton, including minors and UMAS, among whom it has not yet been evaluated.

The determinants of health among UMAS include their country of origin and the availability of the healthcare services of the country in which they are seeking asylum [11], [12], [17]. To the best of our knowledge, no study has assessed the global clinical profile or services use among UMAS in Switzerland, so in this paper, we describe them for UMAS who were treated in a gatekeeping setting comprised of specialized nurse practitioners in the canton of Vaud, Switzerland.

Methods

Description of the healthcare system for UMAS in the canton of Vaud

The migrant care facility (MCF), which is a part of the Lausanne University Outpatient Clinic (LUOC), is responsible for the medical care of UMAS who arrive in the canton of Vaud. The MCF is required to perform an initial health check-up of all UMAS "in the days following their arrival in the canton of Vaud" [18], and specialized nurse practitioners at the MCF provide the first line of care. Should UMAS require medical treatment, the MCF is supposed to refer them primarily to the Interdisciplinary Division for Adolescent Health (DISA), a medical outpatient clinic specialized in adolescent medicine [at Lausanne University Hospital (CHUV)], where they are treated by pediatricians and general practitioners aware of the complex issues surrounding migration. Theoretically, DISA is second in line in terms of care. However, the MCF can also refer UMAS directly to any other hospital or private practice for either general or specialized medical care. Finally, UMAS can visit emergency rooms directly without any referral. Therefore, in the model of canton Vaud, gatekeeping nurse practitioners should first assess asylum seekers in general – and UMAS in particular – at the MCF, except in emergency situations (see [16] for a complete explanation of the healthcare model at the MCF).

Inclusion of UMAS

All UMAS referred by the cantonal Public Health Service (PHS) who had their first consultation at the MCF in 2015 and a unique medical file were eligible for inclusion. An initial pool of 212 patients was identified as being potentially eligible (see Figure 1). From this initial pool, several groups of patients were excluded. These include all patients determined to be non-minors, one patient who first consulted the MCF in 2013, and patients with no medical file or multiple files. The remaining 203 patients met the criteria for eligibility (compatible socio-demographic characteristics and a single medical file at the MCF). After examining the first 30 cases sequentially, one out of every two cases of the remaining 173 patients were selected randomly due to resource constraints, yielding a total patient number of 114. An additional five patients were found to have never had any contact with the healthcare system in Vaud despite having an (empty) medical file at the MCF, and were thus excluded. The remaining 109 patients were included in the analysis.

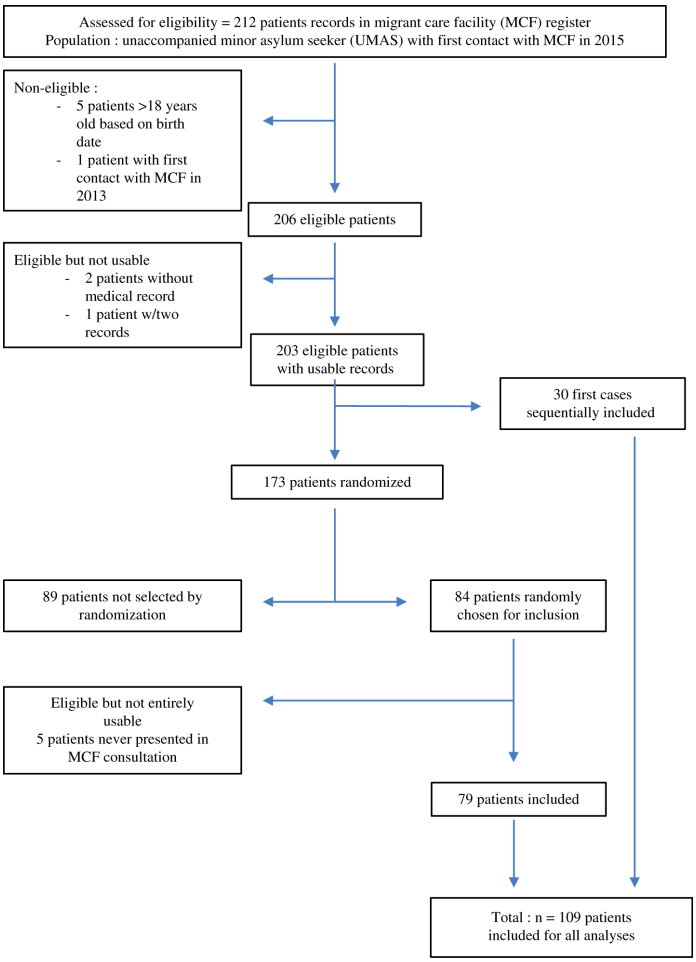


Figure 1: Flow-chart depicting patient inclusion.

Data collection

This was a retrospective study based solely on the electronic medical record (*Soarian*) and the paper records from the DISA. The electronic medical record contained information gathered at the MCF, the LUOC, the different clinics at CHUV, Lausanne Children's Hospital (HEL), as well as at the primary emergency care units located at hospitals in the surrounding area. These were usually the primary structures involved in the care of UMAS in canton Vaud, making it possible to have an overview of the patients' clinical profiles and care pathways.

The patients' socio-demographic information was provided by the PHS. The primary investigator (PCG) reviewed the medical records and compiled the medical reasons for consultation and referral (abbrev. C/R), as well as the diagnoses made at the different healthcare structures. The follow-up period spanned 1 year starting with a patient's first contact with the healthcare system in Vaud. The name of the institution was recorded for each diagnosis and referral.

This study did not systematically include health data from other structures not connected to the electronic medical record. These most commonly include specialists such as ophthalmologists, psychiatrists and psychologists. The information in the patient files made it possible to determine whether the MCF, the DISA or OTH had referred patients to these structures. However, diagnoses could be recorded in our data only if they were conveyed back to the MCF or DISA (e.g. consultation note/discharge summary).

Coding the diagnoses and establishing the care pathways

The primary investigator (PCG) attributed a specific ICD-10 code to each diagnosis and medical reason for C/R found in the files using the notes made by the medical staff in the patients' medical files at their respective healthcare structures. No evaluation of the accuracy of the diagnoses was made. Once coded, the diagnoses and medical reasons for C/R were grouped into broader ICD-10 categories which were then grouped together based on their clinical relevance (AEA).

The number (n) of diagnoses and medical reasons for C/R were calculated individually for each healthcare structure and then used to calculate the prevalence (%) of each diagnosis and medical reason for C/R. The percent prevalence of identical diagnoses and medical reasons for C/R from each healthcare structure were then added together to calculate the total prevalence of each diagnosis and medical reason for C/R across all healthcare structures. This procedure was repeated for the higher category groupings. In both instances, patients presenting at multiple structures for the same health problem were only counted once.

The relevant healthcare structures were subsequently classified as either "MCF", "DISA" or "Other Healthcare Structures" (abbrev. OTH). The number (n) and proportion (%) of patients who consulted the different structures and who were referred from one structure to another were then used in order to establish the care pathways.

Results

Socio-demographic characteristics

In socio-demographic terms (Table 1), the majority of patients in the sample population were male (87.2%) with a mean age of 16.4 years [standard deviation (SD) 1.2, ranging from 11.4 to 17.9]. Eritrea (39.4%) and Afghanistan (32.1%) accounted for more than two-thirds of the patients included (71.2%), followed by Somalia (10.1%) and Syria (5.5%).

Table 1: Socio-demographic characteristics among UMAS (n = 203).

	Study population (n = 109)		Eligible cases (n = 203)	
	n or mean	% or SD	n	%
Sex				
Male	95	87.2	178	87.7
Female	14	12.8	25	12.3
Age				
(Mean and SD)	16.4	1.2		
Martial status				
Single	108	99.1	202	99.5
Divorced	1	0.9	1	0.5
Nationality				
North Africa (Maghreb)	0	0	2	1
Sub-Saharan Africa (SSA)	63	57.8	111	54.8
Horn of Africa	57	52.3	102	50.3
Eritrea	43	39.4	82	40.4
Ethiopia	3	2.8	6	3
Somalia	11	10.1	14	6.9
Other SSA	6	5.5	9	4.5
Middle East	42	38.5	83	40.9
Afghanistan	35	32.1	72	35.5
Iraq	1	0.9	2	1
Syria	6	5.5	9	4.4
East Asia	3	2.8	3	1.5
Mongolia	3	2.8	3	1.5
Eastern Europe	1	0.9	4	2

SD, standard deviation; UMAS, unaccompanied minor asylum seekers.

Care pathways

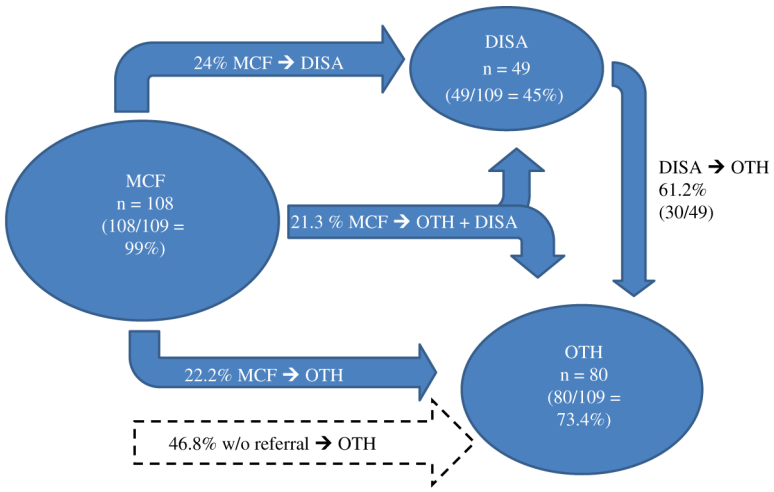
One hundred and fourteen UMAS were referred to the MCF by the cantonal authorities (see Table 2 and Figure 2), of which 108 (95%) consulted the MCF and had an accessible medical file. Five individuals (4.4%) never consulted the MCF and lost all contact with the cantonal authorities. One individual received a medical check-up without passing through the MCF, which brought the total to 109 patients who came in contact with the healthcare system in Vaud at least once. Of the MCF cases (n = 108), four (3.7%) did not have any health problems

during 1 year of follow-up. A total of 20 cases (18.5%), including the four aforementioned cases, were treated exclusively at the MCF.

Table 2: Selected services use among UMAS (n = 109).

Any health problem detected during 1 year of follow-up (n = 109)		
Yes	105	96.3
None	4	3.7
Professional psychological support, at least one time notified (n = 109)		
Yes	32	29.4
No	77	70.6
Healthcare settings where patients were handled (n = 109)		
Only MCF	20	18.3
Only OTH	1	0.9
MCF and DISA	9	8.3
MCF and OTH	39	35.8
MCF, DISA and OTH	40	36.7
Referral pathways from MCF/DISA to OTH (n = 108)		
Never referred from MCF and/or DISA to OTH	49	45.4
MCF and/or DISA → OTH	60	55.6
MCF or DISA → OTH	43	39.8
MCF and DISA → OTH	17	15.7
Referral pathways from OTH to OTH (n = 80)		
OTH → OTH	20	25.0
Self presentation to OTH (n = 109)		
Self → OTH	51	46.8
Only self (never referred) → OTH	14	12.8
Self and referred from any other structure → OTH	37	33.9

MCF, migrant care facility composed of specialized nurse practitioners; DISA, Interdisciplinary Division for Adolescent Health, a medical outpatient clinic specialized in adolescent medicine composed of pediatricians and general practitioners; OTH, other healthcare structures.



MCF = Migrant Care Facility; DISA = Interdisciplinary Division for Adolescent Health; OTH = other healthcare structures

Figure 2: Care pathways of UMAS.

The MCF referred 67.6% of its patients to other structures: 24.1% exclusively to the DISA, 22.2% exclusively to structures other than the DISA, and 21.3% to both the DISA and other structures. All of the patients referred to the DISA presented. Of the patients who presented at the DISA (n = 49), 61.2% were then referred to other structures (OTH). In all, 55.6% of the 108 patients were referred by either the MCF or the DISA to an OTH, of which 15.7% were referred by both the MCF and the DISA.

Of the cases included (n = 109), 73.4%, received care at an OTH at least once. Of the patients who consulted an OTH (n = 80), 25% were referred directly to another structure without returning to the MCF or the DISA. Four cases were referred by the MCF, the DISA, and an OTH to another OTH. Nearly half the UMAS (46.8%) consulted an OTH directly without any referral at least once.

Clinical profile – mental health

In terms of the diagnoses and medical reasons for C/R among the 109 UMAS (see Table 3), 39.4% had at least one mental health problem during the 1-year follow-up. The most common diagnoses were functional disorders (21.1%), mood disorders in the form of unipolar depression (17.4% with likely depressive episodes), PTSD and other severe stress-related reactions (13.8% suffering from anxiety, tension, rumination, sleeping disorders, flashbacks or psychological distress), sleeping disorders (12.8%), suicidal ideation (with and without plan) and attempted suicide (6.4%), and lastly substance abuse (6.4%). The majority of patients with functional disorders (65%) and PTSD (67%) was identified at the DISA. Notes about starting or continuing an existing psychological/psychiatric treatment were found for 29.4% of the patients.

Clinical profile – somatic health

The most common diagnoses were community-acquired respiratory infections (43.1%), which also constituted the most common condition for C/R (31.2%). Most of those patients (74%) consulted in the MCF. These were followed by dermatological conditions (39.4%), notably acne vulgaris (15.6%) and skin abscesses or furuncles (13.8%).

In terms of infectious diseases, 20.2% were infected at least once with scabies, and nearly all of those patients (95%) were identified at the MCF. Additionally, there were five cases of varicella (4.6%), four cases of active tuberculosis (3.7%), three cases of hepatitis B (2.8%), two cases of intestinal parasites (1.8%), and two cases of gastritis caused by *H. pylori* (1.8%).

Various ophthalmological problems were found in 25.7% of the patients, and at least 10 cases (9.2%) of refractive errors and accommodative dysfunction were confirmed in specialist structures and noted in the medical files.

Headaches (21.1%) and general abdominal pain (17.4%) were often cited as a reason for C/R.

Physical traumas were frequent as both diagnosis (30.3%) and reason for C/R (25.7%), with sprains (8.3%) and fractures (7.3%).

Lastly, of the 14 adolescent girls in the sample, three showed evidence of genital mutilation (21.4%), three were pregnant (21.4%) of whom two (14.3%) had an abortion (one spontaneous, one induced) during the 1-year follow-up.

Discussion

Overall, our results coincide with those of similar studies conducted in Europe [19] and highlight the major healthcare needs of UMAS, especially in mental health [6]. Common pediatric community health issues such as benign respiratory infections, physical traumas (contusions, sprains, fractures) and dermatological conditions (acne vulgaris and furuncles/abscesses) remain the most common reasons for consultation among UMAS. However, as noted in several other studies [11], [20], UMAS are often diagnosed with other ailments, particularly communicable diseases (primarily scabies, tuberculosis and hepatitis B), non-communicable diseases including gynecological conditions (genital mutilations, pregnancy and abortion), mental health problems (depression, functional disorders, PTSD), and numerous previously untreated ophthalmological problems.

Table 3: Diagnosis and causes of consultation/referral (C/R) among UMAS by care settings (n = 109).

Code ICD-10	Name	Diagnosis				Causes C/R			
		MCF	DISA	OTH	Total (%)	MCF	DISA	OTH	Total (%)
	Certain infectious and parasitic diseases (A00-B99)								
A0709B60	Parasitic intestinal infections	1	1	0	2 (1.8)	1	0	0	1 (0.9)
A16	Tuberculosis	1	3	6	8 (7.3)	2	1	5	8 (7.3)
A16act	Tuberculosis (active)	1	2	3	4 (3.7)	0	0	1	1 (0.9)
A16.91.CG	Tuberculosis (inactive)	0	1	4	5 (4.6)	0	1	2	3 (2.8)
B18	Hepatitis B	10	5	1	12 (11)	5	5	2	9 (8.3)
B18chron	Hepatitis B (chronic)	3	2	1	3 (2.8)	0	1	1	1 (0.8)
B18.12.CG	Hepatitis B (resolved)	7	3	0	9 (8.3)	0	0	0	0 (0)
B010730	Infections characterized by skin lesions	12	5	5	19 (17.4)	4	2	1	6 (5.5)
B8586	Scabies and pediculosis	22	2	1	24 (22)	23	0	0	23 (21.1)
B86	Scabies	21	1	1	22 (20.2)	17	0	0	17 (15.6)
	Diseases of the blood								
D5051	Nutritional anemias	1	2	2	4 (3.7)	0	1	1	1 (0.9)
E0060	Endocrine, nutritional and metabolic diseases	0	5	2	6 (5.5)	0	0	1	1 (0.9)
F	Mental and behavioral disorders	25	24	18	43 (39.4)	19	13	18	34 (31.2)
R45	Psychological distress	8	0	0	8 (7.3)	7	1	0	7 (6.4)
F1019	Harmful substance use and dependence	4	1	4	7 (6.4)	4	1	3	6 (5.5)
F32	Depressive episode	10	7	5	19 (17.4)	6	5	3	11 (10.1)
F41	Other anxiety disorders	2	1	0	3 (2.8)	2	1	1	4 (3.7)
F43	Reaction to severe stress (PTSD) and adjustment disorders	2	10	6	15 (13.8)	0	0	3	3 (2.8)
F4445	Functional disorders	8	15	6	23 (21.1)	2	1	2	3 (2.8)
F45.4.Cep.CG	Somatoform headache	5	9	2	14 (12.8)	0	0	0	0 (0)
F51	Non-organic sleep disorders	7	7	0	14 (12.8)	6	7	2	14 (12.8)
F7090	Disorders of psychological development	1	2	1	2 (1.8)	1	1	1	1 (0.9)
R45.8	Suicidality and self-harm	0	5	4	7 (6.4)	0	1	8	8 (7.3)
	Diseases of the nervous system								
G4344	Migraines and headaches	6	1	3	10 (9.2)	12	11	6	23 (21.1)
R51	Headache	6	1	1	8 (7.3)	12	11	6	23 (21.1)
H1050	Diseases of the eye	25	2	14	28 (25.7)	10	1	18	22 (20.2)
H52	Disorders of refraction and accommodation	1	0	10	10 (9.2)	0	0	1	1 (0.9)
Hoth	Other eye diseases	0	1	3	4 (3.7)	0	0	2	2 (1.8)
H53	Symptoms of visual disturbance	21	0	0	21 (19.3)	9	0	14	17 (15.6)
H60J30	Diseases of ear, nose and throat	6	6	10	15 (13.8)	18	6	9	29 (26.6)
I3080	Diseases of the circulatory system	1	2	1	4 (3.7)	0	0	2	2 (1.8)
	Diseases of the respiratory system								
J0020	Respiratory infections	35	5	13	47 (43.1)	21	7	12	34 (31.2)
KR10	Diseases of the digestive system	16	7	5	24 (22)	16	8	14	29 (26.6)

K29.5	Chronic gastritis	1	4	1	6 (5.5)	0	0	1	1 (0.9)
Koth	Other diseases of the digestive system	7	1	4	10 (9.2)	6	2	6	10 (9.2)
R10	Abdominal and pelvic pain	7	0	0	7 (6.4)	9	6	7	19 (17.4)
L	Diseases of skin and subcutaneous tissue	30	8	17	43 (39.4)	29	6	18	44 (40.4)
L02	Cutaneous abscess, furuncle and carbuncle	4	2	12	15 (13.8)	1	0	4	5 (4.6)
L70.0	Acne	17	2	2	17 (15.6)	16	2	1	16 (14.7)
Loth	Other diseases of skin and subcutaneous tissue	8	5	2	15 (13.8)	5	1	6	11 (10.1)
Lsymp	Symptoms of skin and subcutaneous tissue	5	0	1	6 (5.5)	15	3	7	24 (22.0)
M	Diseases of the musculoskeletal system	7	7	6	15 (13.8)	6	6	4	11 (10.1)
M54all	Dorsalgia	3	3	1	6 (5.5)	3	4	1	6 (5.5)
Moth	Other diseases of the musculoskeletal system	4	4	5	10 (9.2)	3	2	3	6 (5.5)
	Diseases of genitourinary system and pregnancy								
Nuro	Urological conditions	2	4	3	5 (4.6)	3	4	3	5 (4.6)
OZ30	Contraception, pregnancy, abortion	2	0	4	4 (3.7)	1	1	3	4 (3.7)
Ngyn	Other gynecological conditions	1	0	1	2 (1.8)	1	2	2	4 (3.7)
Z91.7	Female genital mutilation	0	0	3	3 (2.8)	0	0	2	2 (1.8)
	General symptoms and signs								
R52	Pain	12	4	2	15 (13.8)	12	11	10	24 (22.0)
R5355	Malaise and syncope	3	4	2	8 (7.3)	1	4	1	6 (5.5)
ST10	Injury	14	1	25	33 (30.3)	10	0	23	28 (25.7)
Scont	Contusion	9	0	8	15 (13.8)	6	0	7	11 (10.1)
Sfrac	Fracture	0	0	8	8 (7.3)	0	0	7	7 (6.4)
Spran	Sprain	0	1	8	9 (8.3)	0	0	7	7 (6.4)

PTSD, post-traumatic stress disorder; UMAS, unaccompanied minor asylum seekers.

Care pathways

All patients went through an initial health check-up to identify their healthcare needs. Indeed, only four cases did not have any health problems during 1 year of follow-up, and two thirds of the UMAS were referred at least once by the gatekeeping nurse practitioners to another healthcare structure. Furthermore, a referral to structures outside the MCF and DISA (OTH) was necessary for more than half of the patients. Other European studies report similar results on the overall use of healthcare resources for the treatment of UMAS [11], [19] and show that over 25 months of follow-up, 71.6% of UMAS were referred at least once by an outpatient clinic for internal and tropical medicine to a specialist, and that 42.2% were referred to more than one specialist.

Our study confirms findings in the literature regarding the widespread use of healthcare resources by asylum seekers in general and UMAS in particular. The primary reasons include: (1) specific healthcare needs not met by the healthcare system in their country of origin or during transit (e.g. untreated ocular refractive errors, endemic infectious diseases in the country of origin or acquired during transit, untreated orthopedic or dermatological ailments, lack of gynecological care) [11], [19], [21]; (2) major psychological distress in the form of mental health problems and somatic functional disorders leading to frequent consultations in multiple healthcare facilities [21], [22]; and (3) lack of knowledge and understanding of how the healthcare system in the host country operates [12].

Our study also sheds light on the fact that nearly half of the UMAS bypassed the intended pathway and consulted another structure (OTH) directly without referral from the MCF or DISA at least once over a 12-month period. Furthermore, a quarter of the patients treated at another structure (OTH) were then referred to yet another OTH without returning to the first or second structure (MCF and DISA) intended for this purpose. Such alternative pathways should only be used in emergency situations when the intended settings (MCF/DISA) are not available. Their broad utilization is problematic because it leads to fragmentation, a lack of coordination between the different structures and *in fine* inferior care, while generating additional costs. These problems have already been highlighted repeatedly in the care of asylum seekers and refugees in other studies [12], [21], [23], and unfortunately, the gatekeeping system in Vaud has not been able to reduce this phenomena as efficiently as expected and originally intended. Nevertheless, the findings also indicate that nurse practitioners identify and address many health needs of UMAS, thereby reducing the amount of consultations elsewhere.

To improve care coordination and reduce services use, the following improvements could be made: (1) a better understanding on the part of all those involved in the treatment of UMAS of how the system is intended to operate and (2) systematically sending all written documentation regarding any diagnoses made or treatments started in the different structures involved to the MCF. Additionally, the literature [12] proposes (3) providing asylum seekers with repeated, in-depth explanations of how the healthcare system operates with the help of community interpreters. Furthermore, (4) transitioning from a gatekeeping system to a case management system would ensure personalized care and follow-up which would help this particular population benefit from the care pathway as intended. This could potentially lead to overall improvements in care quality (centralized information, verification of treatments and follow-up, reinforced efforts of prevention and health promotion) and greater cost-effectiveness (eliminating unnecessary repeated treatments, reducing the number of emergency room visits). It is important to note that for complex cases, the DISA was sometimes able to fulfill this function and in doing so brought an added value to the care received by the UMAS.

Clinical profile – mental health

As documented widely in many other studies [4], [6], [24], we found a high prevalence of mental health problems among the UMAS (39.4%), the foremost being symptoms and episodes of depression, functional disorders, symptoms related to PTSD, sleeping disorders, suicidal ideation and attempted suicide, and substance abuse. However, in comparison to studies based on questionnaires that systematically recorded self-reported symptoms [8], [24], our study found considerably fewer symptoms of PTSD (compared to 52.7% and 41.9% of patients having significant PTSD scores in the two aforementioned studies). Indeed, the prevalence of PTSD is probably underestimated in our study as its symptoms are not evaluated systematically by caregivers – nurse practitioners and general physicians/pediatricians – not specialized in mental health.

On the other hand, similar to other clinical studies [6], [11], we found a high prevalence of functional disorders (tension headaches, general abdominal pain, back pain without neurological deficit/recent trauma and instances of multiple functional pains), which are absent in questionnaire-based studies not specifically intended to look for these symptoms [8], [24].

The study design (questionnaire vs. patient records) affects the recorded diagnosis and its prevalence, raising the question of active screening in explaining the high prevalence of a disorder compared to studies where clinical diagnoses are recorded without systematic assessment. As the common expression goes, "In medicine,

we find what we look for." All studies among UMAS agree on the very high burden of mental health disorders and the need for active screening.

Mental health is an important problem among UMAS with specificities particular to this population. In the care model presented here, the primary and secondary care structures (MCF and DISA, respectively) were composed of healthcare facilities primarily specialized in somatic health, although providing care for mental and social problems as well. Nevertheless, an interdisciplinary approach integrating the psychosocial aspects of health from the very onset of care may be a necessity. Furthermore, innovative approaches that take cultural differences and migration into consideration should be developed to improve the suitability of mental health treatments offered to UMAS [25], [26]. The same is true concerning effective collaboration between health, educational and social services in order to address these complex, multifactorial health problems appropriately [27]. Lastly, the conditions of hosting UMAS must be adequate to minimize post-migration stressors – for example, absence of legal status, latent risk of forced return, insecurity and overpopulation in accommodation and educational settings, lack of host language acquisition and education/formation/working possibilities [6], [27].

Clinical profile – somatic health

In terms of communicable diseases, we found an astonishingly low prevalence of intestinal parasites (1.8%) and other abdominal infections. These findings stand in stark contrast to studies using systematic screenings [9], [10], [19]. Furthermore, studies have shown that UMAS from SSA are disproportionately affected by these health problems. As a significant proportion of our sample population was made up of patients from this region (especially Eritrea), the discrepancy cannot be attributed to a difference in demographic profile (i.e. country of origin). Instead, it may be explained by the fact that there is no clinical recommendation at these healthcare facilities to include systematic screening for abdominal infections and intestinal parasites for asylum seekers. Thus, very few additional tests – stool and urine microscopy/culture, serological or breath tests – were conducted. Introducing screenings for parasitic infections (schistosomiasis, helminthiasis, giardiasis and amoebiasis) and bacterial infections (*H. pylori*) based on the patient's country of origin (by identifying highly endemic countries) could be one way to improve how these infections are detected and treated. Another possibility would be to offer test treatments using anti-parasitic or antibiotics/antacids (*H. pylori*) which cost considerably less than additional testing if the patient presents with the corresponding clinical symptoms. However, administering treatments without screening or diagnosis may miss detecting infections.

Our population had a much higher prevalence of scabies than found in other studies (20.2% in our study vs. 2.9% [19] and 4.2% [20]). The German Dermatological Society [28] recommends a systematic rapid screening process – asking about a history of pruritus and looking for characteristic lesions on the limbs, especially the back of the hands, during clinical examination – and, when necessary, decontamination – ivermectin/permethrin, washing all personal effects at 60 °C and isolating the patient for 12–24 h – of each new arrival in collective accommodations for asylum seekers. Introducing a similar protocol at UMAS accommodations in our region could potentially reduce the prevalence of this pathology and associated costs – i.e. the numerous consultations related to this infection.

As seen in studies from Germany [11], [19], ophthalmological problems such as refractive errors and accommodative dysfunction were frequent among UMAS. The higher prevalence of ophthalmological problems in the target population in comparison to Swiss adolescents is likely due to late detection, given that those problems had probably not been addressed in the country of origin or during transit. Sometimes, these ailments were addressed after many months of follow-up, upon referral by a teacher for an eye examination. A late diagnosis can be disadvantageous for UMAS because it could result in troubles at school, which may hinder integration into the host country. One strategy would be to introduce a systematic test of visual acuity during the initial check-up.

Limitations

In the original study design, we did not estimate the time necessary for data extraction accurately and thus had to reduce the sample size after beginning data extraction. Although the reduction in sample size was carried out randomly, this along with several anomalies in the medical records resulted in several diversions from the original sampling plan. The distinction between acute and chronic was not made systematically for all conditions in the medical records; therefore, this information was not extracted for analysis.

Our health data are incomplete with regards to structures not linked to the electronic medical record, particularly physicians in private practice. For this reason, we could not determine if the psychiatric/psychological

treatment referrals noted in patient records actually started. Thus, the health data collected and analyzed in our study are not entirely complete, but typical for the Swiss health care system which has no centralization of patient health data.

The robustness of the symptoms and diagnoses made, particularly in the area of mental health, is limited. The diagnoses stem mainly from the notes of primary care physicians and nurses and rarely from specialists. They are often based on the presence of certain symptoms belonging to a group of pathologies without necessarily fulfilling all the criteria listed in the ICD-10 or the DSM-5. New (and ideally prospective) studies with clearly defined criteria for diagnoses would need to be conducted in order to improve the accuracy of diagnoses made and to include all the structures involved.

We took a global approach to establishing the clinical profile and care pathways of the UMAS included in this study and made no differentiations based on socio-demographic information. Other studies highlight important differences by an individual's country of origin, age and sex. Further analysis of our data would be necessary to replicate these findings. Finally, the proportion and number of females are small, limiting the generalization of their findings.

Clinical recommendations

This study analyzes the clinical profile and care pathways of UMAS during the 2015 migrant influx which put the healthcare system into crisis mode. In response, several actions have been undertaken to respond to the needs identified. This includes a mobile team specialized in the mental health of UMAS which visits their settings – accommodations and schools – to improve access to mental health care, continuity in care, and collaboration with the social care network. A system for coordinating mental health for migrants in the canton of Vaud is being set up to better direct patient flow, harmonize care and improve the adequacy and effectiveness of care provided. The MCF and the DISA plan to develop guidelines for the systematic testing for certain somatic diseases, taking into account the socio-demographic profile of asylum seekers (particularly, UMAS) as well as the epidemiology in the countries of origin and transit. These guidelines should react to migratory fluctuations and be able to respond to priorities as determined by geographic provenance.

In conclusion, refugees, asylum seekers and UMAS live in an ever-shifting reality, and their profiles change rapidly. Unfortunately, mental health problems appear to be a constant within this population. This means that having culturally and socially adapted methods for detecting and treating these problems is of utmost importance. Conversely, somatic health problems differ depending on each individual's country of origin, sex, age and the conditions during his/her transit. This means that health care systems must adapt rapidly to the different profiles of asylum seekers and respond adequately to their healthcare needs.

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