Language barriers during vaccination practice, the point of view of healthcare providers

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Abstract

Background. *Language barriers are one of the main obstacles faced by migrants in accessing healthcare services. A compromised communication between migrants and Healthcare Providers in vaccination setting can result in increased vaccine hesitancy and decreased vaccine uptake. The objective of the current study is to investigate Healthcare Providers' perceptions about linguistic barriers faced during both routinary vaccination practice and the extraordinary vaccination program for Ukrainian refugees in the Local Health Authorities of Bologna and Romagna (Italy).*
Methods. *A cross-sectional study was conducted through the administration of a questionnaire examining Healthcare Providers' perceptions. A descriptive analysis and a multiple logistic regression model were adopted to analyze the collected data.*
Results. *Language barriers resulted as an obstacle to informed consent and to doctor-patient relationship. The strategies adopted were perceived as helpful in increasing vaccination adherence, despite communication difficulties were still experienced during refugees' vaccinations. Results suggest that the implementation of translated material and the use of professional interpreters may represent important strategies to overcome linguistic barriers, along with Healthcare Providers' training. Healthcare Providers' opinions could assist the implementation of new tools capable of countering language barriers.*
Conclusions. *The current study represents an example of providers' involvement in understanding the complexities behind the issue of language barriers in vaccination practice.*

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Introduction

Language barriers are recognized as one of the critical issues in migrant or refugee populations' access to healthcare services (1). Specifically, healthcare providers (HCPs) and patients not sharing the same language represent an important obstacle in offering adequate medical care (2). Individuals with limited context-specific linguistic proficiency are considered to be at higher risk of receiving substandard care due to the inability to effectively communicate with HCPs (3). Linguistic barriers may lead to decreased patient satisfaction and trust

in the healthcare system (4). In particular, language barriers and the inherent difficulties related to an unfamiliar setting may lead to the lack of effective communication between migrants and HCPs, increasing the rate of significant misunderstanding (4). These individuals may also be more likely to receive less important medical information, leading to consent problems and non-compliance with treatment plans (5,6).

Language barriers have been addressed as obstacles to reaching the highest standards of care, thus increasing the risk of liability, and affecting providers' effectiveness and satisfaction (4). HCPs facing linguistic barriers experience difficulties in obtaining informed consent and establishing a trustful relationship with patients, experiencing frustration and stress, which may negatively impact the quality of care (7). Furthermore, the presence of linguistic barriers has been associated with increased utilization of healthcare services, causing higher healthcare expenditure and decreased resource availability (8).

Linguistic barriers have been shown to interfere with vaccination practice and contribute to vaccine hesitancy (9). Referring to the 5C model of vaccine hesitancy, language difficulties may represent an obstacle to users' ability to understand, representing an example of constraint to vaccination uptake (10). A systematic review analyzing the determinants of vaccine uptake and under-vaccination in migrant populations in Europe found that language differences significantly compromise the communication between migrants and HCPs, leading to lack of information and decreased vaccine uptake (11,12).

To address this issue, healthcare organizations have implemented various strategies, including the presence of professional interpreters in healthcare settings, bilingual staff, and translated informative materials (13).

During complex emergencies, the risk of the occurrence of language barriers drastically increases, representing an obstacle in delivering care to displaced people (14). In early 2022, the escalation of the conflict between Russia and Ukraine led to the displacement of more than 8 million Ukrainians (15), urging the authorities of countries involved in hosting refugees to face linguistic barriers. In line with international agreements, national and local authorities of host countries established timely reception programs to ensure health and psychological care, housing, school and university attendance, and to facilitate the use of public transportation for displaced people (16). To face the ongoing COVID-19 pandemic, in accordance with the public health best practice on refugees' reception (17), vaccinations have been offered as part of these programs (18–20). In Italy, the refugees' reception strategies and their access to healthcare services were coordinated by Civil Protection at the national level and by the the Local Health Authorities (LHAs), the Municipalities and the Non Governmental Organzations (NGOs) at the local level. The adopted strategies were suited according to the specific context and included preferential routes in accessing health services for refugees, assisted by the presence of professional interpreters and the use of translated written materials (21).

The main objective of this study is to investigate the perceptions of HCPs about the issues related to linguistic barriers encountered during their routinary vaccination practice and those experienced during the extraordinary vaccination program implemented for the Ukrainian refugees in the LHA of Bologna and the District of Cesena of the LHA of Romagna (Italy). Furthermore, the study aims to analyze which tools and strategies are used to contrast language barriers and how those strategies could be strengthened according to HCPs' perceptions.

Materials and Methods

1. Study design

This cross-sectional study investigated HCPs perceptions about language barriers through the analysis of a questionnaire administered to those working as vaccinators in the LHAs of Bologna and the District of Cesena of the LHA of Romagna.

The data collection process took place in the period between October 20 and December 09, 2022. The selection process involved actively proposing the survey to all the HCPs that worked as vaccinators for the COVID-19 vaccination campaign. The total

number of eligible participants was 64 HCPs for the LHA of Bologna and 23 for the District of Cesena of the LHA of Romagna.

All participants were HCPs involved in the medical history collection and vaccine administration in vaccination centers in the LHA of Bologna and the LHA of Romagna. Participants were recruited in-site at the vaccination centers at the end of their shifts and asked to voluntarily participate in the study. Where in-person management of the survey was not possible, participants were actively recruited through alternative methods (e-mail, WhatsApp). The participants responded to the questionnaire autonomously through electronic devices (tablets, notebooks) provided by the authors. The survey was generated using Google Forms. Data were collected anonymously by the research team members. All enrolled individuals provided informed consent for data processing. The study protocol was reviewed and approved by the Ethics Committee for Research and Experimentation of the University of Bologna on 29 September 2022, protocol number: 0245767.

A search of the current literature showed the lack of validated tools that could effectively fit the context of the study. For this reason, the questionnaire was produced by a group of authors and reviewed by a group of public health experts, internal and external to the study. No intelligibility issues occurred during the data collection process.

The survey was composed of two sections. The first one aimed to analyze the experience of HCPs during their business-as-usual (BAU) work, and it was administered to every participant. The second one aimed to investigate specifically the experience of those participants who worked for the Ukrainian refugees' reception.

The first part of the survey collected participants' socio-demographic information, including age, gender, country of origin, spoken languages and professional qualifications. Next, data regarding the frequency of resorting to different strategies to overcome language barriers at the BAU level were asked. In addition, the perceived grade of interference of language barriers in the doctor-patient relationship and in obtaining informed consent, and the perceived usefulness of strategies adopted in adherence to additional vaccinations or doses were indagated through a "Likert-type Scale" level of agreement.

The second part of the survey investigated the use of strategies for overcoming language barriers other than translated materials and interpreters, prior experiences in working with interpreters, and perceptions about the recent experience.

The English version of the survey questions can be found in the Results section (Tables 1-3).

2. Study setting during the Ukrainian crisis

Starting from 24 February 2022, a reception point for Ukrainian refugees was established nearby train and bus stations in the city center of the Metropolitan Area of Bologna. An individual code permitting access to the National Health Service was issued to all refugees. According to National COVID-19 restrictions for international travelers which were valid at the time, a mandatory COVID-19 test was requested within 48 hours from the arrival. When performing the tests, COVID-19 vaccination status was investigated, and voluntary vaccinations were proposed to those with incomplete immunization status. When needed and requested by the refugees, other vaccinations, such as Tetanus, Diphtheria, Pertussis, and Polio (Tdap-IPV), Measles, Mumps, and Rubella (MMR), or Varicella (V), were also offered.

To facilitate the communication between HCPs and refugees, the LHA of Bologna provided translated materials and ensured the presence of linguistic interpreters in the vaccination center. The translated materials consisted in general and COVID-19-specific informative material about healthcare services dedicated to refugees and how to reach them. Moreover, the necessary anamnestic forms for COVID-19 and other vaccinations were translated. All documents were available on a dedicated webpage (21) and on paper at the vaccination center. Furthermore, the presence of interpreters was assured in healthcare settings dedicated to refugees, including the vaccination center (21).

A total number of 24 of the 64 HCPs working as vaccinators in LHA of Bologna also worked for the vaccination campaign dedicated to Ukrainian refugees.

3. Statistical analyse

Participants' characteristics and responses were summarized using mean and standard deviation, and absolute and relative frequencies, where requested.

Based on previous research findings (22,23), the authors hypothesized that individuals with different demographic characteristics or different working experience and qualification background may have different perceptions of problems related to language barriers. A multiple logistic regression model was employed to analyze the associations between socio-demographic variables and HCPs' perceptions about

the problems investigated. A first model was employed analyzing age, gender, country of origin and English language proficiency as determinants of considering linguistic barriers as obstacles in obtaining informed consent. The same model was used to analyze those socio-demographic factors as determinants of considering linguistic barriers as obstacles in patient-doctor relationship and of the perceived usefulness of strategies adopted in improving patients' adherence to other vaccinations. Outcome variables were analyzed as dichotomous variables created by "Likert-type Scale" questions about consent, patient-doctor relationship and usefulness of strategies, considering as '1' those individuals that responded 'agree' or 'strongly agree', and '0' those individuals that responded 'neither agree nor disagree', 'disagree' or 'strongly disagree'.

The statistical significance level was set as $p < 0.05$. All analyses were performed using R-Studio statistical software (R version 4.1.2 (2021-11-01), R-Studio version 2021.09.2, PBC, Boston, MA, USA).

Results

1. Sample Characteristics

A total of 60 HCPs participated in the study, with 65% (n=39) females and 33% (n=20) males. The mean age of the participants was 37 (SD=14). The response rate was 75% for the LHA of Bologna and 61% for the LHA of Romagna.

The sample consisted mostly of resident doctors (70%, n=42), followed by specialty doctors (20%, n=12), graduate doctors (6.7%, n=4) and nurses (3.3%, n=2). The vast majority of the participants worked for the LHA of Bologna (77%, n=46), 12 (20%) worked for the LHA of Romagna, while the remaining 2 (3.3%) worked for both. Of the respondents, 92% (n=55) were Italian. Regarding specifically the professional area of language proficiency, 95% (n=57) of the participants referred to be proficient in English, 6.7% (n=4) reported to be proficient in Spanish, 13% (n=8) reported to be proficient in French, and 10% (n=6) of participants reported to be proficient in other languages. Complete sample characteristics are summarized in Table 1.

2. Language barriers during BAU work

When asked about how frequently they experienced language barriers in a professional setting, 37% (n=22) of the sample answered "often", 50% (n=30)

Table 1 - Sample characteristics.

Characteristic	N = 60[1]
Gender	
F	39 (65%)
M	20 (33%)
Other	1 (1.7%)
Age	37 (14)
Professional qualification	
Nurse	2 (3.3%)
Resident doctor	42 (70%)
Graduated doctor	4 (6.7%)
Specialty doctor	12 (20%)
Local Health Authority	
Bologna Local Health Authority	46 (77%)
Romagna Local Health Authority	12 (20%)
Both	2 (3.3%)
Country of origin	
Italy	55 (92%)
Albania	2 (3.3%)
Colombia	1 (1.7%)
Moldova	1 (1.7%)
United States	1 (1.7%)
Having a high level of English language proficiency	
No	3 (5.0%)
Yes	57 (95%)
Having a high level of Spanish language proficiency	
No	56 (93%)
Yes	4 (6.7%)
Having a high level of French language proficiency	
No	52 (87%)
Yes	8 (13%)
Having a high level of proficiency in other languages	
No	54 (90%)
Yes	6 (10%)

[1] n (%); Mean (SD).

"sometimes" and 13% (n=8) "rarely". In facing language barriers, 42% (n=25) of the HCPs reported often relying on a relative or acquaintance of the patient for translation, while 38% (n=23) reported often using a language that is not native to neither the patients nor themself, such as English. Furthermore, 47% (n=28) reported never asking for the help of a colleague to translate. Of the participants, 27% (n=16) reported never using a translation application/software

Table 2 - Linguistic barriers during "business-as-usual" work.

Characteristic	N = 60
How often do you interact with patients who have a lack of knowledge of the Italian language?	
Rarely	8 (13%)
Sometimes	30 (50%)
Often	22 (37%)
How often do you use the following tools to communicate with patients who have a lack of knowledge of the Italian language?	
I speak the same language as the patient	
Never	13 (22%)
Rarely	22 (37%)
Sometimes	20 (33%)
Often	5 (8.3%)
I communicate with the patient in a common language (e.g., English)	
Never	2 (3.3%)
Rarely	5 (8.3%)
Sometimes	19 (32%)
Often	23 (38%)
Always	11 (18%)
A relative/acquaintance of the patient translates	
Never	4 (6.7%)
Rarely	4 (6.7%)
Sometimes	26 (43%)
Often	25 (42%)
Always	1 (1.7%)
A colleague translates	
Never	28 (47%)
Rarely	15 (25%)
Sometimes	14 (23%)
Often	3 (5.0%)
I communicate in writing through apps/sites of translation	
Never	16 (27%)
Rarely	18 (30%)
Sometimes	19 (32%)
Often	7 (12%)
I communicate orally through translation apps/sites	
Never	22 (37%)
Rarely	25 (42%)
Sometimes	11 (18%)
Often	2 (3.3%)
I use material translated by an interpreter	
Never	34 (57%)
Rarely	17 (28%)
Sometimes	7 (12%)
Often	2 (3.3%)
I make use of an interpreter via call/video call	
Never	51 (85%)
Rarely	6 (10%)
Sometimes	3 (5.0%)

I make use of an interpreter in the presence

Never	47 (78%)
Rarely	8 (13%)
Sometimes	5 (8.3%)

Language barriers could be an obstacle to obtaining informed consent

Strongly disagree	2 (3.3%)
Disagree	4 (6.7%)
Neither agree nor disagree	7 (12%)
Agree	15 (25%)
Strongly agree	32 (53%)

Language barriers could be an obstacle to the doctor-patient relationship

Disagree	3 (5.0%)
Neither agree nor disagree	9 (15%)
Agree	23 (38%)
Strongly agree	25 (42%)

The tools used facilitated the patient's adherence to other doses/vaccinations

Strongly disagree	2 (3.3%)
Disagree	5 (8.3%)
Neither agree nor disagree	22 (37%)
Agree	21 (35%)
Strongly agree	10 (17%)

What measures do you consider a priority to enhance to overcome the difficulties of language barriers?

Paper medical history form in foreign language

No	17 (28%)
Yes	43 (72%)

Printed material in foreign language with information regarding the vaccine

No	17 (28%)
Yes	43 (72%)

Printed material in foreign language with administrative/bureaucratic information

No	15 (25%)
Yes	45 (75%)

Possibility to call an interpreter remotely

No	25 (42%)
Yes	35 (58%)

Possibility of having an interpreter in attendance

No	40 (67%)
Yes	20 (33%)

In which languages do you think it is a priority to enhance the measures you marked in the previous question?

Arab

No	19 (32%)
Yes	41 (68%)

Chinese

No	8 (13%)
Yes	52 (87%)

English

No	40 (67%)
Yes	20 (33%)

Urdu

No	19 (32%)
Yes	41 (68%)

Bengali	
No	38 (63%)
Yes	22 (37%)
Russian	
No	48 (80%)
Yes	12 (20%)
Romanian	
No	49 (82%)
Yes	11 (18%)
Ukrainian	
No	46 (77%)
Yes	14 (23%)
Albanian	
No	53 (88%)
Yes	7 (12%)
Other Languages	
No	51 (85%)
Yes	9 (15%)

to communicate by written text, while 32% (n=19) reported sometimes using it and 12% (n=7) reported using it often. Moreover, 37% (n=22) of respondents reported never using a translation app/software for oral communication, 42% (n=25) reported rarely using it, and 18% (n=11) reported using it often. Moreover, most of the participants reported never using an interpreter, either remotely (85%, n=51) or in person (78%, n=47).

Most of the HCPs identified the translation in different languages of administrative/bureaucratic information materials (75%, n=45) and medical modules and materials (72%, n=42) as a priority. Furthermore, 58% of the participants (n=35) also highlighted as a priority the possibility of contacting an interpreter remotely when needed. The willingness/urgency to improve the aforementioned tools was indicated as particularly relevant for Chinese (87%), Arabic (68%), Urdu (68%), Bengali (37%) and English (33%) languages.

A large percentage of the participants agreed or strongly agreed that language barriers are an obstacle to informed consent (78%, n=47) and to doctor-patient relationship (80%, n=48). Moreover, 52% of the participants (n=31) agreed or strongly agreed in considering the tools and strategies used to overcome language barriers as helpful in increasing adherence to additional doses/vaccinations.

Results from the descriptive analyses are summarized in Table 2.

3. Logistic regression results

The results of the logistic regression analysis are reported in the Supplementary Materials (File S1). No statistically significant associations were found between socio-demographic variables of participants and their perceptions about informed consent and patient-doctor relationship problems related to language barriers. Additionally, no predictor variable resulted as a determinant of the perception of usefulness of the strategies adopted in improving the adherence to other vaccinations.

4. Linguistic barriers during the refugees' reception

A total of 24 HCPs participated in the second part of the survey. The majority of the participants were female (71%, n=17), with a mean age of 39 (SD=15). The response rate of those who worked as vaccinators for Ukrainian refugees was 100%. In terms of professional qualifications, all were medical doctors. In particular, 62% (n=15) of the participants were medical residents, 21% (n=5) were specialized physicians, and 17% (n=4) were medical doctors without specialty training and not enrolled in a residency. Only 8.3% (n=2) of the participants reported to be proficient in English.

Only 1 doctor communicated with the refugees in their mother tongue (Ukrainian or Russian language). Regarding communicating with the refugees in shared language, i.e., English, 21% (n=5) of participants reported never doing so, while 29% (n=7) reported often

communicating in a common non-native language. Of the participants, 54% (n=13) often communicated with patients through a family member or an acquaintance, and 46% (n=11) of them never asked for the help of a colleague for translation purposes. About the use of translation apps for communication, 38% (n=9) of participants never used them, while 29% (n=7) sometimes used them. Half of the participants (n=12) never used a translation app orally.

Only 1 participant (4.2%) had received specific training in working with interpreters, while 50% (n=12) of the participants thought that such training should be integrated into medical education.

The majority of the participants (79%, n=19) reported they sometimes, often, or always experienced difficulties in ensuring that the patient received all the information. Similarly, 67% (n=16) of the participants reported they sometimes, often, or always experienced uncertainty whether the interpreter was accurately reporting the words used by the healthcare professional, and an even higher percentage of participants (75%, n=18) reported having doubts about the correct transposition of medical terminology into the patient's mother tongue. Furthermore, only 13% (n=3) of the participants always asked the interpreter to verify if the patient understood everything. Finally, 67% (n=16) of the participants agreed or strongly agreed that the presence of the interpreters and the interventions used facilitated the adherence to other doses/vaccinations.

The results of this descriptive analysis are summarized in Table 3.

Table 3 - Linguistic barriers during Ukrainian refugees' vaccination program.

Characteristic	N = 24[1]
Age	39 (15)
Professional qualification	
Nurse	0 (0%)
Resident doctor	15 (62%)
Graduated doctor	4 (17%)
Specialty doctor	5 (21%)
Having a high level of English language proficiency	
No	2 (8.3%)
Yes	22 (92%)
How often do you use the following tools to communicate with patients who have a lack of knowledge of the Italian language?	
I speak the same language as patient (Ukrainian/Russian)	
Never	22 (92%)
Rarely	1 (4.2%)
Always	1 (4.2%)
I communicate with the patient in a common language (e.g. English)	
Never	5 (21%)
Rarely	6 (25%)
Sometimes	5 (21%)
Often	7 (29%)
Always	1 (4.2%)
A relative/acquaintance of the patient translates	
Never	1 (4.2%)
Rarely	2 (8.3%)
Sometimes	5 (21%)
Often	13 (54%)
Always	3 (12%)
A colleague translates	
Never	11 (46%)
Rarely	7 (29%)
Sometimes	6 (25%)
I communicate in writing through apps/sites of translation	

Never	9 (38%)
Rarely	3 (12%)
Sometimes	7 (29%)
Often	5 (21%)
I communicate orally through translation apps/sites	
Never	12 (50%)
Rarely	4 (17%)
Sometimes	4 (17%)
Often	4 (17%)
Have you ever received specific training in working with an interpreter?	
No	23 (96%)
Yes	1 (4.2%)
Do you think that specific training in working with an interpreter should be part of the training of a healthcare professional?	
No	12 (50%)
Yes	12 (50%)
How often do you experience the following difficulties in working together with an interpreter?	
I am not sure if the patient has received all the information	
Never	4 (17%)
Rarely	1 (4.2%)
Sometimes	11 (46%)
Often	6 (25%)
Always	2 (8.3%)
I'm not sure if the interpreter translated my exact words	
Never	5 (21%)
Rarely	3 (12%)
Sometimes	7 (29%)
Often	7 (29%)
Always	2 (8.3%)
I'm not sure if the interpreter translated the medical terminology correctly	
Never	2 (8.3%)
Rarely	4 (17%)
Sometimes	10 (42%)
Often	5 (21%)
Always	3 (12%)
I felt excluded from the conversation when the interpreter and the patient spoke to each other	
Never	5 (21%)
Rarely	4 (17%)
Sometimes	8 (33%)
Often	5 (21%)
Always	2 (8.3%)
How often do you ask the patient, through an interpreter, if he/she understood all the information given?	
Rarely	2 (8.3%)
Sometimes	6 (25%)
Often	13 (54%)
Always	3 (12%)
The tools used facilitated the patient's adherence to other doses/vaccinations	
Strongly disagree	1 (4.2%)
Neither agree nor disagree	7 (29%)
Agree	10 (42%)
Strongly agree	6 (25%)

[1] Mean (SD); n (%).

Discussion

1. Summary of the results

The results of this study highlighted that HCPs perceive linguistic barriers as an obstacle to optimal vaccination practices, particularly when trying to obtain an informed consent or fostering an effective doctor-patient relationship. Conceivably, effective communication is considered a crucial part of vaccination practice by HCPs, enabling them to clearly convey the risks and benefits of vaccines to the patients (24). This process may be hindered by linguistic barriers, which can lead to misunderstandings, confusion, and inaccurate information process on the part of both physician and patient (25). In the context of linguistic barriers, obtaining a truly informed consent is often reported as challenging and can compromise patient autonomy (26). Such barriers may also compromise the establishment of a positive doctor-patient relationship (24), which is essential in fostering trust and facilitating effective healthcare delivery (27).

Considering these issues, it is not surprising that non-native speakers are often considered "hard-to-reach" populations in vaccine hesitancy discussions (12). Due to several obstacles, the migrant population may find difficulties in reaching vaccination services (28). Linguistic, cultural, communication and legal barriers are the main obstacles preventing migrants from accessing vaccination services, and more generally, the healthcare system (12). Furthermore, according to the International Organization for Migration (IOM), in most countries, vaccination campaigns do not include migrants in irregular situations (28). A study by Crawshaws et al. suggested that migrants need more linguistically tailored information to allow informed decisions about vaccination. Strategies aimed at improving migrant population's access to vaccination included the translation of the needed information, the provision of tailored messages, the inclusion of interpreters into the staff, and the implementation of specific training for HCPs (11).

The survey findings suggest an overlap between the languages spoken by local migrant populations and the languages identified by HCPs as relevant for the translation of informative materials and anamnestic modules (29). Most HCPs defined the improvement of materials in non-European languages as a priority, suggesting that most difficulties were encountered when communicating with non-European users. This finding may represent a positive indication of the HCPs responsiveness to the needs of the local migrant community, highlighting the importance of considering the linguistic diversity of a given population when designing and disseminating health-related information (30).

The Ukrainian refugees' COVID-19 vaccination experience showed that an ad hoc intervention to overcome language-related problems was perceived as useful by the majority of the participants. The use of professional interpreters has been shown to significantly impact healthcare providers' work-related satisfaction in healthcare settings. Professional interpreters are shown to facilitate effective communication between healthcare providers and patients, and may lead to improved satisfaction, safety, and increased adherence to the treatment plans of patients (31). However, a large part, or the majority of HCPs declared to rely also on other strategies to overcome language barriers with refugees, such as translation apps and triadic communications with a refugee's family member.

This study highlighted the nearly complete lack of training in working with an interpreter in the HCPs' curricula. However, to enhance communication with non-native speakers, literature examples suggest that training in working with linguistic interpreters is needed in medical doctors and nurses' curricula (32,33). This training should aim at developing culturally and linguistically appropriate communication skills and strategies for working with interpreters. Effective communication with linguistic interpreters requires careful planning, active listening, the use of plain language, triadic communication, and cultural awareness (34). By employing these strategies, HCPs can effectively communicate with non-native speakers, enhancing patient care quality. Additionally, this study highlighted that vaccinators were unsure about the interpreters' translation during the medical history collection. Other literature examples highlighted the existence of insecurities of healthcare providers during triadic communication with patients and interpreters (35). The lack of training in working with professional interpreters in HCPs education may represent a cause of these insecurities. The timely implementation of translated material and the use of professional interpreters may represent important strategies to overcome linguistic barriers in public health complex emergencies. The HCPs' difficulties in working with interpreters may be addressed by enhancing the presence of specific training in the medical curricula.

Most of the HCPs involved in the Ukrainian refugees' vaccination were satisfied with the ad hoc strategies used to overcome linguistic barriers, considering them useful in facilitating adherence to

other doses or treatments. The results highlighted the lack of training in working with interpreters in the participants' educational background. This may partly explain the difficulties reported in working with professional interpreters. Further studies with wider samples are needed to analyze the prevalence of training programs related to language barriers in medical curricula, and to provide a detailed analysis of the difficulties that HCPs may face while working with interpreters.

The results of the logistic regression analysis highlighted that no sociodemographic variables were associated with HCPs' perceptions about informed consent and patient-doctor relationship problems related to language barriers, and about the usefulness of the strategies adopted in improving adherence to other vaccinations.

2. Study limitations

There are some limitations that should be acknowledged. First, the design of the study involving the use of self-report measures may be associated with a higher risk of information bias. Second, this study is based on a small sample and refers to the experience of a small number of vaccination centers, affecting the generalizability of the findings to other vaccination centers, and generally, to other healthcare settings. Moreover, the response rates were high but not 100%, respectively 75% for HCPs that were working for the LHA of Bologna and 61% for HCPs that were working for the LHA of Romagna, providing a less comprehensive view of vaccinators' perceptions. Third, it is important to acknowledge that the present study utilized a non-validated questionnaire to collect responses from participants. As such, this choice may introduce potential limitations and impact the overall reliability and validity of the findings. Future research should consider employing rigorously validated instruments to enhance the robustness of data collection and strengthen the study's conclusions.

Despite the generalizability issue and the compromised validity of using a non-standardized questionnaire, this study provides a valuable insight into HCPs' perceptions and perceived difficulties related to linguistic barriers at BAU and in a particular emergency setting.

Conclusions

The results of this study highlighted that language barriers during vaccination practice are perceived as an obstacle in obtaining informed consent and in achieving a valuable doctor-patient relationship by vaccinators. Moreover, language barriers may affect adherence to further vaccinations. HCPs reported difficulties and a lack of training in working with interpreters. Addressing those problems during medical education may improve the effectiveness of communication between HCPs and non-native speakers in vaccination centers.

Further studies are needed to explore language barriers in vaccination centers in different geographical context and to investigate the impact of specific training and strategies aimed to address them.

In conclusion, this study represents a valuable example of providers' involvement in understanding the complexities behind the problem of language barriers in vaccination practice. Providing effective communication in languages originally spoken by the migrant population may contribute to reducing health disparities and improving health outcomes. The collection of feedback from the HCPs involved could assist in implementing new tools capable of countering language barriers. As an example, new translated materials may be implemented in those languages that are described as a priority by the majority of the participants. In addition, strengthening the possibility of contact remotely with professional interpreters may represent a valuable help for the HCPs facing language barriers during their practice.

Riassunto

Barriere linguistiche nella pratica vaccinale, il punto di vista degli operatori sanitari

Premessa. Le barriere linguistiche rappresentano uno dei principali ostacoli incontrati dai migranti nell'accesso ai servizi sanitari. Una comunicazione compromessa tra migranti e operatori sanitari nel contesto della vaccinazione può comportare un aumento dell'esitazione vaccinale e una diminuzione dell'adesione al vaccino. L'obiettivo del presente studio è quello di indagare la percezione degli operatori sanitari riguardo alle barriere linguistiche affrontate sia durante la pratica vaccinale di routine che durante il programma di vaccinazione straordinaria per i rifugiati ucraini nelle Aziende Sanitarie Locali di Bologna e della Romagna (Italia).

Metodi. È stato condotto uno studio trasversale attraverso la somministrazione di un questionario che esamina le percezioni degli Operatori Sanitari. Per analizzare i dati raccolti sono stati

adottati un'analisi descrittiva e un modello di regressione logistica multipla.

Risultati. Le barriere linguistiche sono risultate un ostacolo al consenso informato e al rapporto medico-paziente. Le strategie adottate sono state percepite come utili per aumentare l'adesione alla vaccinazione, nonostante si riscontrassero ancora difficoltà di comunicazione durante le vaccinazioni dei rifugiati. I risultati suggeriscono che l'implementazione di materiale tradotto e l'uso di interpreti professionisti possono rappresentare strategie importanti per superare le barriere linguistiche, insieme alla formazione degli operatori sanitari. Le opinioni degli operatori sanitari potrebbero aiutare l'implementazione di nuovi strumenti in grado di contrastare le barriere linguistiche.

Conclusioni. Lo studio attuale rappresenta un esempio del coinvolgimento degli operatori sanitari nella comprensione delle complessità dietro la questione delle barriere linguistiche nella pratica vaccinale.

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Supplementary material

Table S 1 - Analyses of associations between healthcare professionals' characteristics and their perceptions about informed consent, doctor patient relationship and usefulness of strategies used in increasing adherence.

Predictors	Odds Ratios	95% CI	p
Informed consent			
Gender			
Female	-	-	-
Male	0.75	0.18 – 3.41	0.702
Age	0.97	0.93 – 1.02	0.237
Country of origin			
Foreigner			
Italian	4.55	0.43 – 48.51	0.184
Good proficiency in English language			
No	-	-	-
Yes	3.74	0.18 – 107.65	0.380
Doctor-patient relationship			
Gender			
Female	-	-	-
Male	1.06	0.23 – 5.74	0.941
Age	0.97	0.92 – 1.01	0.138
Country of origin			
Foreigner			
Italian	4.62	0.43 – 49.75	0.182
Good proficiency in English language			
No	-	-	-
Yes	3.75	0.17 – 109.94	0.383
Usefulness of strategies used in increasing adherence			
Gender			
Female	-	-	-
Male	0.43	0.13 – 1.32	0.147
Age	1.01	0.97 – 1.05	0.705
Country of origin			
Foreigner			
Italian	0.28	0.01 – 2.82	0.338
Good proficiency in English language			
No	-	-	-
Yes	1.46	0.05 – 43.53	0.803

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