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Experiences of communities with Lebanon's model of care for non-communicable diseases: a cross-sectional household survey from Greater Beirut

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ABSTRACT

Objectives Assess community perceptions of the Lebanese care model for non-communicable diseases (NCDs) and trust in the health system among others, and test association between them.

Design Cross-sectional study using multistage random sampling and targeting adult community members living with NCDs.

Setting Households in Greater Beirut—Lebanon.

Participants 941 respondents including 574 Lebanese community members and 367 Syrian refugees.

Primary and secondary outcomes Three main outcomes (barriers to care seeking, perceptions of the care model and trust in healthcare) were assessed including by multiple linear regressions.

Results Reported NCDs were hypertension (51.3%) and diabetes (34.5%), followed by chronic respiratory conditions (21.9%) and other cardiovascular diseases (20.0%). Communities reported seeking care from different sources. While 78% of Lebanese participants had visited private clinics at least once within the 6 months preceding the survey, 56% of Syrian refugees had done so. Determinants of access to care were health coverage, gender, and employment among Lebanese, and socioeconomic status among Syrian refugees. Lebanese community members had more positive perceptions of the care model compared with Syrian refugees and determinants included sociodemographic characteristics and the type of providers. Trust in the health system was higher among Syrian compared with Lebanese participants and was significantly influenced by the care model score and barriers to care seeking.

Conclusion Our study generated evidence about the experience of people living with NCDs with Lebanon's care model and can inform service delivery interventions towards a more inclusive person-centred approach.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study is the first household survey to explore non-communicable disease care delivery in the fragile context of Lebanon and adds to the global health literature on the topic.

⇒ The study used robust sampling methods and multiple regression analyses.

⇒ Findings are generalisable with high-quality evidence for informing health system strengthening approaches.

⇒ Social desirability bias could have contributed to participants noting higher levels of trust in healthcare especially among the refugee community despite poorer perceptions of the primary care model among them.

⇒ This risk of bias is low given the high similarity in the rank of trust dimensions and in some determinants of trust between the study subgroups.

BACKGROUND

Non-communicable diseases (NCDs) are one of the most pressing health challenges of our time. Including cardiovascular diseases, cancers and mental health disorders among others, NCDs make up 63.8% of the global disease burden and are the primary cause of disability and mortality globally.[1] They additionally present substantive risks when occurring in conjunction with other conditions, as also evident from the COVID-19 pandemic.[2]

Addressing the NCD burden is of utmost priority and potential solutions encompass whole of government and population-based approaches which can assist with both primary and secondary prevention, such as WHO Best Buys, as well as implementation of high-quality, comprehensive and continuous care models.[3] Given the high global and local disease burden in many countries, such a model can be considered the cornerstone of a health system's service delivery. Indeed, the 2008 WHO report on primary healthcare (PHC) considered the implementation of a comprehensive person-centred primary care model as a key determinant for improving

health system responsiveness to population health needs, including of those affected by NCDs.[4]

Health systems in situations of fragility[5 6] face multiple but unique challenges in relation to the implementation of NCD care models. First, in many countries that have faced conflict or major crises such as environmental shocks, both donor aid and service delivery priorities have historically focused on sexual and reproductive health, child health and on addressing a high burden of injuries.[7] While priorities have evolved and now include provision for mental health and psychosocial support, comprehensive support for NCDs in situations of crisis is still rare despite high population prevalence.[7 8] Second, for countries which are undergoing substantive sociopolitical unrest, but also economic challenges, NCD service delivery may be particularly needed but costly to set up.[9] For example, skilling up existing health workers with limited NCD experience,[10] investing in the continued supply and maintenance of medical devices and medications needed for diagnosis and disease management,[11] as well as adapting existing, or creating new, health management and information systems[12] require relatively high upfront costs, despite likely cost-effectiveness of such interventions.[13] Across all these situations, successful implementation of a person-centred comprehensive and continuous care model is particularly difficult.

Where such care models are absent or ill implemented, as they are in many situations of fragility, the trust of communities and service users in the health system may be affected.[14] Fragility can also arise at the interface between community and health systems and manifest in this loss of trust.[6] For example, trust in the health system could affect access to and use of medical care as well as affect a person's relationship with providers.[15] This relationship is essential in the case of NCDs given the prolonged nature of service utilisation that is needed to maintain disease control and prevent further complications. Despite its importance, trust in health systems is understudied, especially in low and middle-income settings.[15]

This paper focuses on the case of Lebanon, an extremely fragile setting, and the perceptions of persons affected by common NCDs regarding the care model they encounter at health facilities. In Lebanon, NCDs dominate the population health profile but care for the conditions is affected by the general fragmentation of health services.[16] A system analysis of NCD prevention and control in Lebanon suggested that persons of diverse socioeconomic backgrounds, and under different coverage schemes, experience different challenges in access to healthcare and that health-seeking behaviours of affected persons are diverse but critically shaped by the role of trust in the overarching health system.[17 18] The current study builds on these insights and seeks to identify people's perceptions of the Lebanese care model for NCDs and trust in the health system among others, and test association between them.

Aims and objectives

This study aims to survey the perceptions of adult community members (Syrian refugee or Lebanese host community members) living with NCDs in the Greater Beirut area in relation to the healthcare model they encounter when seeking care for their condition.

The specific objectives of the study were to:
- ► Describe how persons access care: from whom, what barriers are encountered, what factors influence these barriers.
- ► Describe the perceptions of patients with NCD in Greater Beirut in relation to the care model they encounter, including examining differences between Lebanese and Syrian participants.
- ► Assess the levels of trust of the aforementioned participants in the health system and identify whether this is associated with self-reported health status.

METHODS
Design and sampling

This cross-sectional study used multistage random cluster sampling within each subdistrict of the Greater Beirut area, using the probability proportional to size approach and based on an existing sampling frame used in previous surveys.[19] Within clusters, households were randomly selected and one eligible participant was recruited per household until the final sample size of 384 Syrian participants and 576 Lebanese participants was reached (see online supplemental appendix 1 for sample size estimation and eligibility criteria).

Participant recruitment

As data collection was due to take place during the height of the COVID-19 pandemic, researchers employed a data collection agency offering phone-based data collection services. The agency already had contact details of community members agreeing to take part in health-related research within the targeted geographical location. Potential participants were called via telephone, an information sheet and oral consent form were shared and participants were then asked if they can be contacted after 2 hours or at a different time to check their willingness to participate. Data collection was conducted between October and December 2020.

Data collection

Data were collected in Arabic using a newly developed questionnaire (see online supplemental appendix 2) which covered the following variables and scales:
- ► Care-seeking practices over the last 6 months: number of consultations or visits to health facilities and providers, access to NCD care, affordability of NCD care and out-of-pocket expenditures.
- ► Care model characteristics including regular and trusted relationship, continuity of care, comprehensiveness, coordination and other potential attributes from the 2008 WHO report on PHC[4] and the Johns Hopkins Primary Care Assessment Tool.[20] Perceptions

on these care model characteristics were gathered in order to be aggregated into a care model score—the higher the score, the more positive the view of persons with NCDs regarding the care they receive.

► Trust with eight domains (honesty, communication, confidence, competence, confidentiality, fairness, fidelity and systems trust) as from Ozawa and Sripad.[15]

► Others: sociodemographic characteristics including age, gender, health coverage and social capital (structural dimension only),[21] as well as self-reported overall health status which had five possible responses on a Likert scale: 1—very bad; 2—bad; 3—fair; 4—good; 5—very good.[22]

The survey was piloted on 30 participants who met the eligibility criteria prior to the implementation of the full survey. Few edits to the Arabic version were made for better understanding and one item was removed from the scale on the features of the care model as respondents found it similar to another item. Examples were added to questions flagged to be difficult by data collectors in order to avoid any misinterpretation of questions and the risk of providing different clarifications by different data collectors during the full execution of the survey (to avoid information bias).

Psychometric properties of used scales

We assessed the psychometric properties of both care model score and trust score using Cronbach's alpha test for reliability, and factor analysis using principal components according to the Oblimin rotation for content validity. Cronbach's alpha coefficients were 0.95 (excellent) and 0.86 (very good), respectively. The Kaiser-Meyer-Olkin measures of sampling adequacy were 0.96 (for the care model score) and 0.88 (for the trust score) confirming the appropriateness of factor analysis for this data set. Bartlett's test of sphericity—investigating the existence of at least one significant correlation between two of the score items—was also significant ($p<0.001$) for both scores. In the correlation matrix of each score (not shown in this article), all statements correlated well and none of the coefficients is very high (more than 0.9) excluding the risk of singularity the need to eliminate any items.

Data analysis

The data were cleaned and analysed for all participants, as well as by subgroup, distinguishing between Lebanese and Syrian participants. Descriptive analyses were conducted in relation to each variable and also sample characteristics. Continuous variables were reported using means and SDs, whereas categorical variables were tabulated and reported using counts and proportions.

Bivariate analyses assessed (1) the differences in sources of health seeking and health status by subgroup, and (2) the associations between selected sociodemographic characteristics and health-related variables with three main outcomes. The latter were indices and total scores referring reflective of barriers to care seeking, perceptions of

the care model and trust in the health system (see online supplemental appendix 2 for details on which questions were used as basis for calculation). Statistical tests included: t-tests, analysis of variance or Kruskal-Wallis, Pearson's correlation test and χ^2 tests. For each outcome, three multiple linear regressions (one for each subgroup according to nationality and one for the whole sample) were developed including all variables which were significantly associated with the outcome in the bivariate analysis (p value ≤0.05), in order to determine their joint effects. Statistical analyses were conducted using SPSS V.23.

Patient and public involvement

Patients or the public were not involved in the design, or conduct, or reporting or dissemination plans of our research.

FINDINGS

We first offer an overview of sample characteristics and then present the three main outcomes in three sections.

Sample characteristics

A total of 941 participants (574 Lebanese and 367 Syrian) were recruited to the study. Participant characteristics are summarised in table 1. Overall, the majority of participants were between 46 and 55 years and male. Most participants were married (76%) and from a low educational background: 56.2% with only primary or secondary school attainment, with an unequal distribution by nationality (37.8% among Lebanese vs 88% among Syrian refugees). Fifty-two per cent and 50% of the group were unemployed and of low socioeconomic status (SES), respectively. In terms of health coverage, only 36% of the Syrian refugee community and about 67% of the Lebanese community reported having a formal health coverage.

Reported NCDs in our sample were hypertension (51.3%) and diabetes (34.5%), followed by chronic respiratory conditions (21.9%) and other cardiovascular diseases (20.0%) (see online supplemental figure 1).

Section 1: access to care
Where healthcare was sought

The two studied communities reported seeking care from different sources. While 78% of Lebanese participants had visited private clinics at least once within the 6 months preceding the survey, 56% of Syrian refugees had done so. Twenty-one per cent of Syrian patients reported only one visit to private clinics.

The percentages of visits to primary care centres and dispensaries differ among groups as well: 40% of Lebanese respondents had visited a primary care centre/dispensary at least once in the same period compared with 68% of Syrian respondents.

The pharmacy was identified as a source of non-physician consultations for both communities with higher demand among Lebanese participants (56% reporting at

Table 1 Sociodemographic characteristics of participants by nationality (N=941)*

Variables	Lebanese (n=574)	Syrian (n=367)	Total (N=941)
Age categories, n (%)			
<25	57 (9.9)	33 (9.0)	90 (9.6)
26–35	51 (8.9)	51 (13.9)	102 (10.8)
36–45	75 (13.1)	101 (27.5)	176 (18.7)
46–55	159 (27.7)	102 (27.8)	261 (27.7)
56–65	130 (22.6)	47 (12.8)	177 (18.8)
66–75	72 (12.5)	29 (7.9)	101 (10.7)
>75	30 (5.2)	4 (1.1)	34 (3.6)
Age in years, mean (SD)	51.0 (15.9)	45.6 (13.6)	48.9 (15.2)
Gender, n (%)			
Male	301 (52.4)	199 (54.2)	500 (53.1)
Female	273 (47.6)	167 (45.5)	440 (46.8)
Prefer not to mention	0 (0.0)	1 (0.3)	1 (0.1)
Marital status, n (%)			
Married	417 (72.6)	298 (81.2)	715 (76.0)
Widowed	43 (7.5)	31 (8.4)	74 (7.9)
Single	107 (18.6)	35 (9.5)	142 (15.1)
Separated/divorced	7 (1.2)	3 (0.8)	10 (1.1)
Educational level, n (%)			
Primary school or less	55 (9.6)	188 (51.2)	243 (25.8)
Secondary school	162 (28.2)	124 (33.8)	286 (30.4)
High school	191 (33.3)	37 (10.1)	228 (24.2)
University	166 (28.9)	18 (4.9)	184 (19.6)
Employment status, n (%)			
Employed	266 (46.3)	153 (41.7)	419 (44.5)
Unemployed	278 (48.4)	211 (57.5)	489 (52.0)
Retired	30 (5.2)	3 (0.8)	33 (3.5)
Crowding index (mean±SD)†	1.23 (0.52)	2.6 (1.22)	1.78±1.10
Socioeconomic status (SES), n (%)‡			
Low SES	166 (28.9)	306 (83.4)	472 (50.2)
Middle SES	293 (51.0)	43 (11.7)	336 (35.7)
High SES	115 (20.0)	18 (4.9)	133 (14.1)
Health coverage, n (%)			
Yes	387 (67.4)	132 (36.0)	519 (55.2)
No	187 (32.6)	235 (64.0)	422 (44.8)

*19 participants were excluded as parents reported information on non-adult patients living with non-communicable disease (NCD).
†Crowding index (CI)=number of household members/number of rooms excluding the kitchen and the toilets.
‡Based on CI: low SES if CI≥1.5; middle SES if 0.75<CI<1.5; high SES if CI≤0.75.

least one consultation visit compared with 40% among Syrian refugees).

About one-fifth of the sample reported at least one visit to the emergency department of local hospitals for NCD-related complaints (24% among Lebanese vs 15% among Syrian respondents) and about 17% of all respondents were admitted to the hospital during the 6 months preceding the survey (21% among Lebanese compared with 11% among Syrian refugees).

Support for health seeking
When asked about the types of persons they would approach for support in case of urgent hospitalisation, most Lebanese participants (92.5%) reported the ability

and willingness to contact their immediate family and relatives, compared with 77.4% of Syrian participants. Other sources named by Syrian refugees were non-governmental organisations and United Nations agencies (8.2%), neighbours (5.2%) and friends (4.9%).

Self-reported health status

About 55% of Lebanese participants reported a good or very good status compared with only 39% among Syrian refugees living with NCD (see online supplemental figure 2).

Barriers to care seeking

The primary barrier to care seeking was the same for both communities and identified as financial barriers; the least relevant barrier was noted as cultural. All barriers scored higher among the Syrian refugee community compared with the Lebanese community with the widest difference at the level of financial affordability of healthcare (mean difference of 1.06 over 5). All differences were statistically significant except for psychological barriers to healthcare. Online supplemental appendix 3 provides a different presentation of findings by categories of answers. For instance, while about 21% of the Lebanese sample reported encountering financial barriers to care often or every time they seek healthcare, this proportion increases significantly to 62% among the Syrian refugee group.

As we anticipated that financial issues would present a main barrier to health seeking, health expenditures as percentage of monthly income were also assessed. Major differences within and between the study groups exist with higher percentages among Syrian refugees as about half of Syrian respondents pay at least 20% of their monthly income on health expenditures, compared with 27.1% among Lebanese respondents (see online supplemental appendix 4).

Influences on barriers to care seeking

When considering the total impact of barriers on care seeking, the total barriers to care seeking score suggest that Syrian refugees experience more barriers than host communities (see online supplemental figure 3). However, when considering the median barrier score, responses from the two communities appear similar. Bivariate analyses suggest that lower SES, unemployment, lower educational background, being a woman and the absence of health coverage all have significant bearing on whether persons experience barriers to care seeking (data not shown).

Table 2 offers an overview of the multivariable linear regression models of barriers across all participants and for the subgroups. Among Lebanese participants, the presence of health coverage, male gender and being in employment were the three variables most strongly associated with a decrease in the barrier score. SES also has bearing, with higher SES being associated with an estimated decrease of 0.55 (95% CI 0.18–0.92) for each level of SES as well as higher education with an estimated

decrease of 0.38 (95% CI 0.05–0.71). In contrast, being female and additional years of age are associated with increases in the barriers score. For Syrian refugees, only being in employment and higher SES were still significantly associated with decreases in the barriers score. No other variables were significantly associated with the total score.

Section 2: perceptions on the NCD care model

In this section, we summarise the perceptions of communities regarding the NCD care model. Perceptions are summarised according to the features of a person-centred PHC model (for full list of questions that survey participants answered relating to this see online supplemental appendix 2). For full findings of the analyses please see online supplemental appendix 5. The higher the care model score, the better the perceptions of surveyed participants regarding the care they receive; perceptions are summarised according to domains below.

Availability of a regular and trusted health provider

At least 83% of the Lebanese participants either agreed or strongly agreed with each of the statements about having a stable and regular relationship with an accessible main provider as an entry point to the health system. This percentage is 62% among the Syrian refugee group.

Continuity of care

About 80% of Lebanese agreed or strongly agreed with being able to regularly use health services to follow-up on their condition(s). Only 49% of Syrian refugees said this.

Comprehensiveness of services

When asked about care coordination, the coordination of information and coordination of services between different providers were acknowledged positively by about 85% and 64% of Lebanese and Syrian respondents, respectively.

Only 78% of Lebanese respondents agreed they received appropriate care for all their health problems, and a lower percentage (68%) agreed that they can access secondary and tertiary NCD prevention services such as cancer screening and early detection of NCD complications. In contrast, among Syrian respondents, 46% agreed they received appropriate care, and 34% said they could access relevant secondary and tertiary prevention services.

Person-centredness

Only 67% of the Lebanese and 43% of the Syrian participants acknowledged that their health providers know them very well as persons and not just their medical condition(s). A higher percentage (81% for Lebanese and 65% for Syrian) acknowledged they were able to share their opinion about the provided care and get explanations from health providers.

Finally, at least 87% of respondents in both communities agreed with statements on the cultural competence of

Table 2 Multivariable linear regressions of barriers to care (outcome) and covariates among people living with NCDs in Greater Beirut—Lebanon (2021)*

Model 1—subgroup 1: Lebanese CMs (n=574)	Estimate (95% CI)
Covariates	
Age (continuous variable)	**0.04 (0.02; 0.06)**
Gender (reference category=male)	**0.74 (0.19; 1.29)**
Marital status (reference category=married)	0.14 (−0.23; 0.51)
Education (reference category=primary school or less)	**−0.38 (−0.71; −0.05)**
Current employment (reference category=unemployed)	**−0.66 (−1.25; −0.06)**
Socioeconomic status (reference category=low SES)	**−0.55 (−0.92; −0.18)**
Health coverage (reference category=no)	**−1.35 (−1.89; −0.80)**
Model 2—subgroup 2: Syrian CMs (n=367)	
Covariates	
Age (continuous variable)	0.02 (−0.03; 0.05)
Gender (reference category=male)	0.25 (−0.57; 1.06)
Marital status (reference category=married)	−0.42 (−0.93; −0.08)
Education (reference category=primary school or less)	−0.23 (−0.65; 0.18)
Current employment (reference category=unemployed)	**−1.48 (−2.36; −0.60)**
Socioeconomic status (reference category=low SES)	**−1.12 (−1.74; −0.50)**
Health coverage (reference category=no)	−0.63 (−1.30; 0.04)
Willingness to approach immediate family/relatives for help (reference category=no)	−0.44 (−1.17; 0.29)
Model 3—both communities (n=941)	
Covariates	
Age (continuous variable)	**0.03 (0.01; 0.05)**
Gender (reference category=male)	**0.62 (0.17; 1.07)**
Marital status (reference category=married)	−0.10 (−0.39; 0.19)
Education (reference category=primary school or less)	**−0.36 (−0.62; −0.10)**
Current employment (reference category=unemployed)	**−0.92 (−1.41; −0.44)**
Socioeconomic status (reference category=low SES)	**−0.71 (−1.02; −0.40)**
Nationality (baseline=Lebanese)	**0.87 (0.32; 1.43)**
Health coverage (reference category=no)	**−1.05 (−1.48; −0.63)**
Willingness to approach immediate family/relatives for help (reference category=no)	−0.16 (−0.75; 0.42)

Model 1: R^2=0.15, $F(7, 566)$=15, $p<0.001$.
Model 2: R^2=0.19, $F(8, 358)$=10.60, $p<0.001$.
Model 3: R^2=0.23, $F(9, 931)$=30.26, $p<0.001$.
Results in bold are significantly associated with the outcome.
*Included categorical variables had the same categories as in the bivariate analysis (check online supplemental appendices for more details).
CMs, community members; NCD, non-communicable disease; SES, socioeconomic status.

providers. There were no major differences between the two communities.

Influences on overall perceptions of the care model

While outliers exist across both groups, Lebanese respondents had significantly better perceptions of the care model compared with Syrian respondents (see online supplemental figure 4).

Bivariate and multivariate analyses investigated the association between the total care model score and sociodemographic characteristics of participants as well as barriers to care, type of main provider and sources of healthcare seeking (eg, visits to PHC centres). Online supplemental appendix 6 provides the detailed results of bivariate analyses, and regressions are presented in table 3.

Across Lebanese participants, positive perceptions of the care model were significantly associated with participants having health coverage and higher levels of educational attainment. This relationship remains significant even when accounting for barriers to care seeking. Further, perceptions of the care model differed according to the type of healthcare provider that participants sought

Table 3 Multivariable linear regressions of care model score (outcome) and other covariates among people living with NCDs in Greater Beirut—Lebanon (2021)*

Model 1—subgroup 1: Lebanese CMs (n=574)	Estimate (95% CI)
Covariates	
Gender (reference category=male)	−0.84 (−2.19; 0.50)
Education (reference category=primary school or less)	**1.04 (0.31; 1.76)**
Current employment (reference category=unemployed)	−0.61 (−2.07; 0.85)
Socioeconomic status (reference category=low SES)	0.80 (−0.10; 1.71)
Health coverage (reference category=no)	**2.31 (0.94; 3.69)**
Barriers to care (continuous variable)	**−0.67 (−0.87; −0.46)**
Main provider (reference category=pharmacist)	**2.08 (1.38; 2.79)**
Visits to private clinics (reference category=none)	**0.65 (0.09; 1.21)**
Visits to PHC centres (reference category=none)	−0.43 (−0.89; 0.03)
Visits to pharmacy (consultations) (reference category=none)	**0.75 (0.31; 1.19)**
Visits to hospital ER (reference category=none)	−0.20 (−1.41; 1.02)
Hospital admissions (reference category=none)	0.33 (−0.93; 1.59)
Model 2—subgroup 2: Syrian CMs (n=367)	
Covariates	
Education (reference category=primary school or less)	**1.68 (1.09; 2.26)**
Current employment (reference category=unemployed)	−0.46 (−1.64; 0.73)
Socioeconomic status (reference category=low SES)	**1.35 (0.54; 2.15)**
Willingness to approach immediate family/relatives for help (reference category=no)	0.75 (−0.87; 2.37)
Health coverage (reference category=no)	**4.55 (3.38; 5.72)**
Barriers to care (continuous variable)	**−0.68 (−0.86; −0.50)**
Main provider (reference category=pharmacist)	**2.85 (2.20; 3.51)**
Visits to private clinics (reference category=none)	0.06 (−0.30; 0.42)
Visits to PHC centres (reference category=none)	−0.10 (−0.44; 0.23)
Visits to pharmacy (consultations) (reference category=none)	**0.83 (0.45; 1.21)**
Hospital admissions (reference category=none)	0.62 (−0.19; 1.43)
Model 3—both communities (n=941)	
Covariates	
Age (continuous variable)	**0.10 (0.06; 0.14)**
Marital status (reference category=married)	**0.74 (0.02; 1.47)**
Education (reference category=primary school or less)	**1.40 (0.75; 2.05)**
Current employment (reference category=unemployed)	0.29 (−0.80; 1.37)
Socioeconomic status (reference category=low SES)	**1.59 (0.81; 2.38)**
Nationality (reference category=Lebanese)	**−1.63 (−3.04; −0.21)**
Willingness to approach immediate family/relatives for help (reference category=no)	0.16 (−1.29; 1.62)
Health coverage (reference category=no)	**2.82 (1.74; 3.89)**
Barriers to care (continuous variable)	**−0.28 (−0.45; −0.11)**
Main provider (reference category=pharmacist)	**1.63 (1.02; 2.23)**
Visits to private clinics (reference category=none)	−0.11 (−0.43; 0.21)
Visits to PHC centres (reference category=none)	−0.18 (−0.48; 0.12)
Visits to pharmacy (consultations) (reference category=none)	**0.67 (0.32; 1.01)**
Visits to hospital ER (reference category=none)	−0.15 (−1.13; 0.82)
Hospital admissions (reference category=none)	0.77 (0.18; 1.72)

Model 1: R^2=0.27, $F_{(12, 561)}$=17, $p<0.001$.
Model 2: R^2=0.36, $F_{(11, 355)}$=18, $p<0.001$.
Model 3: R^2=0.37, $F_{(15, 925)}$=35.51, $p<0.001$.
Results in bold are significantly associated with the outcome.
*Included categorical variables had the same categories as in the bivariate analysis (check online supplemental appendices for more details).
CMs, community members; ER, emergency room; NCD, non-communicable disease; PHC, primary healthcare; SES, socioeconomic status.

care from: the total care model score was highest for those seeking care from specialists and gradually lower for the other categories (family physicians, general practitioners and lowest for pharmacists). Consultation visits to private clinics and to pharmacies are also associated with increases in the care score.

For Syrian participants, positive perceptions of the care model were also associated with participants having health coverage, higher levels of educational attainment and with being part of a higher socioeconomic group. The effect of health coverage was higher for this group compared with Lebanese participants. Barriers to care remained a negative influence and differences between the types of care providers were similar among this group as for the Lebanese one. Visits to private clinics had no bearing on perceptions of the care model; however, visits to pharmacies were still associated with increases in the care model score.

Section 3: trust in the health system

Participants were asked for their average level of agreement relating to a series of statements corresponding to the Ozawa and Sripad framework on trust in the health system.[15]

High levels of agreement were reported in relation to statements on communication with health providers, confidentiality, competence and honesty. Lebanese respondents ranked the related statements in this same order with corresponding percentages of agreement decreasing from 92.9% (for communication) to 78.2% (for honesty). Syrian refugees scored those statements very high as well, but communication moved to fourth place (with an agreement percentage of 86.4%) after the following: confidentiality (94.3%), competence (91.0%) and honesty (88.5%).

Lower levels of agreements were identified for confidence in the reliability of the health system (67.4% of Lebanese respondents and 77.6% of Syrian respondents), fairness of the system to provide care to disadvantaged and vulnerable groups (57.3% of Lebanese respondents and 72.5% of Syrian respondents) and the fidelity of health providers to work beyond self-gain (46.8% of Lebanese respondents and 55.9% of Syrian respondents). Finally, the statement around the overall system trust scored at 78.6% of agreement among the Lebanese group and 84.5% among the Syrian group. (See online supplemental appendix 7 for full results.)

Influences on trust in the health system

Limited differences between the trust scores of Lebanese and Syrian refugee respondents are evident (see online supplemental figure 5): the medians among both groups are closely aligned and while views of Syrian refugees appear more positive and show less dispersion, it is clear that outliers exist.

Bivariate analyses suggested multiple variables (most sociodemographic characteristics and barriers to care, sources of health seeking, care model score and reported health status) significantly influenced trust in the health system. However, many of those variables were no longer significant in the multivariable analysis (presented in table 4). Importantly, trust in the health system was negatively associated with health status; however, this relationship was not statistically significant.

For Lebanese participants, increases in care model score and decreases in barriers to seeking care are both significantly associated with increases in the trust score. The outcome increases by 0.25 (95% CI 0.20; 0.29) for each one-unit increase in the care model score and by 0.32 (95% CI 0.21; 0.43) for each one-unit decrease in the 'barriers to care' score. The type of health provider and visits to pharmacy for consultations are also significantly associated with trust in care. Analyses suggest that the trust scores are highest among those seeking care at specialists. In contrast, seeking care from the pharmacy was associated with a decrease in trust. Health coverage had limited bearing on trust, and trust itself was not significantly associated with health status (ie, disproving the relationship that improved outcomes may bolster trust in the system).

For Syrian refugees, a positive perception of the care model remained significantly associated with higher levels of trust. The type of the main provider was also significantly associated with trust in healthcare with a higher estimate (1.16 with 95% CI 0.66; 1.67) compared with the Lebanese subgroup. Health coverage remained significantly associated with the outcome at this multivariable level (estimate=0.98 and 95% CI 0.14; 1.83) unlike among the Lebanese community. Trust was positively associated with health status; however, this relationship was not statistically significant.

DISCUSSION

Our findings indicate that access to NCD services in the capital of Lebanon is inequitable, with Syrian refugees experiencing more barriers to care seeking compared with host community members. Principal factors that affect health seeking and service accessibility include refugee status, poor SES and absence of health coverage. Findings indicate that the two communities seek care from different sources: Syrian refugees rely primarily on primary care centres and dispensaries, compared with Lebanese host community members who primarily seek care from specialists. Pharmacies were also identified as an important source of health service provision.

Primary barriers to care seeking were the same among both communities and relate to financial challenges to care access. For Lebanese persons, health coverage, gender and employment were important influences on access to care; for Syrian refugees, SES only is statistically significantly associated with this. Health status among both communities was poor overall: approximately 5 in 10 Lebanese community members reported being in good health compared with 4 in 10 for Syrian refugees.

Perceptions of the care model significantly differ by community. Lebanese community members generally

Table 4 Multivariable linear regression of trust in healthcare (outcome) and covariates among people living with NCDs in Greater Beirut—Lebanon (2021)*

Model 1—subgroup 1: Lebanese CMs (n=574)	Estimate (95% CI)
Covariates	
Age (continuous variable)	−0.02 (−0.04; 0.01)
Education (reference category=primary school or less)	0.21 (−0.20; 0.62)
Current employment (reference category=unemployed)	0.01 (−0.66; 0.67)
Health coverage (reference category=no)	0.03 (−0.66; 0.73)
Barriers to care (continuous variable)	**−0.32 (−0.43; −0.21)**
Main provider (reference category=pharmacist)	**0.44 (0.08; 0.80)**
Visits to private clinics (reference category=none)	0.08 (−0.20; 0.30)
Visits to PHC centres (reference category=none)	−0.08 (−0.31; 0.15)
Visits to pharmacy (consultations) (reference category=none)	**−0.28 (−0.49; −0.06)**
Visits to hospital ER (reference category=none)	0.20 (−0.40; 0.79)
Hospital admissions (reference category=none)	−0.16 (−0.78; 0.45)
Care model score (continuous variable)	**0.24 (0.20; 0.29)**
Model 2—subgroup 2: Syrian CMs (n=367)	
Covariates	
Education (reference category=primary school or less)	−0.09 (−0.55; 0.38)
Health coverage (reference category=no)	**0.98 (0.14; 1.83)**
Barriers to care (continuous variable)	−0.08 (−0.20; 0.04)
Main provider (reference category=pharmacist)	**1.16 (0.66; 1.67)**
Visits to private clinics (reference category=none)	0.17 (−0.01; 0.36)
Visits to pharmacy (consultations) (reference category=none)	0.11 (−0.15; 0.37)
Visits to hospital ER (reference category=none)	0.41 (−0.33; 1.15)
Hospital admissions (reference category=none)	0.08 (−0.59; 0.75)
Care model score (continuous variable)	**0.17 (0.14; 0.21)**
Health status (reference category=very bad/bad)	0.01 (−0.55; 0.56)
Model 3—both communities (n=941)	
Covariates	
Age (continuous variable)	−0.02 (−0.04; 0.01)
Education (reference category=primary school or less)	0.20 (−0.11; 0.51)
Current employment (reference category=unemployed)	−0.97 (−1.34; −0.60)
Nationality (reference category=Lebanese)	**2.05 (1.41; 2.69)**
Health coverage (reference category=no)	0.47 (−0.05; 0.99)
Barriers to care (continuous variable)	**−0.26 (−0.34; −0.18)**
Main provider (reference category=pharmacist)	**0.59 (0.31; 0.88)**
Visits to private clinics (reference category=none)	**0.17 (0.02; 0.32)**
Visits to pharmacy (consultations) (reference category=none)	−0.07 (−0.24; 0.09)
Visits to hospital ER (reference category=none)	0.23 (−0.23; 0.69)
Hospital admissions (reference category=none)	−0.23 (−0.68; 0.22)
Care model score (continuous variable)	**0.22 (0.19; 0.25)**
Health status (reference category=very bad/bad)	−0.37 (−0.77; 0.02)

Model 1: R^2=0.39, $F(12, 561)$=29.75, $p<0.001$.
Model 2: R^2=0.43, $F(10, 356)$=26.79, $p<0.001$.
Model 3: R^2=0.38, $F(13, 927)$= 44.59, $p<0.001$.
Results in bold are significantly associated with the outcome.
*Included categorical variables had the same categories as in the bivariate analysis (check online supplemental appendices for more details).
CMs, community members; ER, emergency room; NCD, non-communicable disease; PHC, primary healthcare.

have more positive perceptions compared with Syrian refugees. Among Lebanese participants this can be partly attributed to presence of health coverage and level of education, even when accounting for barriers to care seeking. However, for this group of participants, positive perceptions correlated with the type of healthcare provider accessed: those accessing specialists and private clinics were likeliest to have positive perceptions. For Syrian refugees, healthcare coverage, level of education and SES also influenced perceptions of the care model, but barriers to care negatively influenced perceptions. There were no differences in perceptions depending on whether care was sought from private providers.

Trust in the health system was higher among Syrian compared with Lebanese participants, but differences in scores were notable by item. For example, approximately half of Lebanese participants perceived the system as fair in its care provision to disadvantaged and vulnerable groups compared with almost three-quarters of Syrian refugees. Trust was significantly influenced by the care model score and barriers to care seeking.

Evidence on inequitable access to health services is high in low and middle-income countries (LMICs) even with the implementation of health reforms and interventions.[23] Levesque *et al* conceptualised access to care by integrating factors from both supply and demand sides and the context (eg, urban areas), and summarised them in five concepts: approachability; acceptability; availability and accommodation; affordability; and appropriateness.[24] Our study findings showed gaps in all those dimensions and validated that reducing inequities in access to care should tackle different elements such as cultural and psychological barriers (affecting acceptability), and financial barriers to care affecting the capacity of people to use health services. Some of these inequities are explained by contextual factors such as the availability and distance to health facilities which are not directly assessed in this survey.

Our findings identified disparities in terms of services provided to different community members by exploring how different communities perceived the NCD care received. Empirical research in other LMIC settings also investigated perceptions and attributes of the care model and explored inequities in the distribution of primary care services. For instance, Pongpirul *et al* reported satisfactory but inequitable features of primary care between different regions in Thailand and therefore identified pitfalls in the PHC policy of the country that need to be addressed.[25] Our study also highlighted more positive perceptions—likely associated with better care features—within the private sector. Similar findings were reported by a study in Hong Kong where primary care experiences were better when received from private providers,[26] showing the importance of such approaches to understand the differences in primary care quality of services in the case of multiple providers. In terms of the specialty of providers, a study in Taiwan showed that patients visiting primary care physicians reported better experiences in

relation with several domains such as continuity, coordination and comprehensiveness of services, compared with those seeking care from specialists.[27] These findings from a setting where there is no restriction on physician choice such as Lebanon contradict the findings of our study, suggesting that more support is needed for the primary care workforce in Lebanon to take the lead on providing essential services and have the power to be gatekeepers of the health system.

This survey offered insights on the complexity of trust in healthcare and its determinants. The first observation is that community members identified gaps in different aspects of trust—related to both interpersonal trust and institutional trust, confirming the dynamic and multi-dimensional characteristics of this concept.[28] Of major importance were the lower scores on the reliability and fairness of the system (elements of institutional trust) and the fidelity of providers to work beyond self-gain (element of interpersonal trust), compared with other dimensions such as competence of providers and confidentiality. This difference in perceptions between domains may relate to general perceptions of commercialisation of healthcare in Lebanon,[16] and confirms that structural reforms in the system towards universal health coverage would contribute to increasing trust of communities in the health system.

Our findings also validated hypotheses from previous research studies on the impact of accessibility of care, primary care features of provided services and the type of providers on people's trust in healthcare.[17 18] However, an unexpected observation was the negative association between receiving pharmacist consultations and trust in healthcare, even though this same variable of pharmacist consultations was associated with more positive perceptions of care. A reasonable explanation is that community members view accessing pharmacists as easier compared with physicians but acquire negative perceptions on the health system because of the need to find such alternatives. Therefore, the discussion about the role of different providers within the health system in Lebanon and in other fragile contexts should take into account providers' contribution to the delivery of quality services and also the impact on community trust in the system and its implications of their relationship with the system.

A few limitations can be identified in our survey. Recruitment of respondents and data collection over the phone might have introduced risk of sampling and information biases even if we had the geographical location of potential participants in the predefined clusters as per our sampling approach. The reasons for these concerns are: (1) changes in the addresses of potential participants might happen; and (2) data collectors cannot be fully confident that respondents are in a private setting while responding. To address such risks of bias, we ensured that the data collection agency used a recently updated database of potential participants, and data collectors took the oral consent of participants on the second follow-up call to allow participants enough time to make their decision

and to be able to select a time when their privacy is guaranteed, and they are comfortable to participate. Another limitation is linked to the use of a single-question score for health status which was used and validated in other contexts[22] but not in the Lebanese context, and the inability to assess its reliability. The absence of significant associations between some covariates and the outcomes in subgroup regression models despite being significant in the overall model (for both communities) might indicate a limitation in relation with the sample size. Moreover, some unexpected lack of associations between sociodemographic factors and the outcomes, especially among Syrian refugees, can be explained by the 'skewed' (but accurate) characteristics of this community in terms of lower educational levels and SES, as well as the inclusion of studied outcomes in the subsequent regressions (eg, adding barriers to care as a covariate in the care model and trust regressions). Finally, the quantitative design could not provide an in-depth explanation of inferences that were not expected from our previous qualitative research on this topic,[17 18] such as the negative association between receiving pharmacist consultations and trust in healthcare. While this further explanation could have benefited from additional qualitative techniques, our main aim was to get generalisable findings regarding the main outcomes and test hypotheses regarding their explaining factors.

CONCLUSION

Our study suggests that communities in Lebanon experience and perceive differences in NCD care access and provision. Evidence generated from this paper could guide service delivery interventions (eg, relating to ensuring and strengthening continuity and quality of care among diverse providers, including non-specialists) and inform how to make the process and targets of NCD service delivery for NCDs in Lebanon and other similar fragile contexts more inclusive and person centred.

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