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# Overcoming Barriers to Service Access: Refugees' Professional Support Service Utilization and the Impact of Human and Social Capital

Ellen Heidinger<sup>1</sup> 

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## Abstract

After arriving in a new country, refugees are typically dependent on professional support to re-establish their livelihood. However, it is well documented that refugees face barriers when seeking access to services aimed at facilitating their settlement. This study examines refugees' support service needs, their actual utilization, and investigates the impact of social and human capital on service utilization. Using data from the IAB-BAMF-SOEP Survey of Refugees (2016–2019;  $N=7662$ ), this paper, employing nested logistic regression models, highlights the diversity of refugees' support service needs as well as large differences in utilization across eight different domains during the first couple of years after arriving in Germany. It provides evidence for an overall positive association between human and social capital and service utilization in general while also revealing differences in service domains. While language proficiency is positively associated with service utilization across all service domains, previous work experience in the country of origin particularly increases utilization of employment-related services. The analyses also find a positive association of inter-ethnic networks, whereas intra-ethnic connections are negatively associated with service utilization across many domains. The findings are especially relevant since they support the hypothesis of exclusive host community knowledge that benefits those refugees who engage with individuals outside their own ethnic network. The findings of this study accentuate the need to acknowledge the diversity of refugees' service needs as well as the barriers to service utilization that only well-equipped refugees seem to be able to overcome.

**Keywords** Refugees · Service utilization · Professional support services · Human capital · Social capital

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## Introduction

Refugees constitute the most vulnerable of all groups of migrants. This not only holds for challenges experienced before and during the flight but also upon arrival in the host country. Research suggests that post-migration stressors might be just as powerful as events before or during the flight when it comes to predisposing factors for psychological health problems and integration difficulties (Gleeson et al., 2020; James et al., 2019). Undergone trauma, family loss, family separation, deprived living conditions, cultural barriers, language barriers, isolation, and uncertainty about the future are just some of the factors refugees have to deal with upon arrival (Ghahari et al., 2020; Steel et al., 2009). To address these issues and to re-establish their livelihood, refugees are oftentimes highly dependent on support and assistance, as they can only draw from a severely limited pool of formerly accumulated resources in their country of origin (Makwarimba et al., 2013; Saunders et al., 2015).

When faced with legal, financial, personal, housing, employment, or health needs as an outcome from post- and pre-migration stressors, professional services become important and valuable by providing support and assistance. At the same time, it is well established that refugees face barriers when seeking access to services aimed at facilitating their settlement and integration (Bajwa et al., 2017; Francis & Yan, 2016; Streitwieser et al., 2018). The sole existence of assistance does not guarantee utilization and, thereby, is often insufficient for catering to refugees' needs. Examples of factors acting as barriers include missing knowledge of services available and helpful, a lack of language skills, missing cultural trust, and limited means of transportation (Gilmartin & Dagg, 2021). These barriers can hinder, if not prohibit, service utilization, thereby creating a mismatch between service needs and service utilization. This means that not all needs can be met through the utilization of suitable services.<sup>1</sup>

Prior research explores which groups of refugees are most prone to this mismatch. Refugees with limited resources in the domains of social networks, informal support, education, labor market experience, or socio-economic status are more likely to be disadvantaged in the access to services compared to individuals with higher levels of these resources, which can be condensed as social and human capital (Choi et al., 2015; Kosyakova & Brücker, 2020; Nakhaie, 2018). Existing literature uses mostly qualitative methods and focuses on specific domains of needs, like medical care (Morris et al., 2009; Stephan et al., 2018), educational attainment (Bajwa et al., 2017; Streitwieser et al., 2018), or labor market participation (Lamba, 2003). Therefore, we still lack a comprehensive analysis of the diversity of service needs and service utilization as well as a comparison across different socio-demographic groups among the heterogeneous population of refugees. Additionally, the current debate misses research on predictors of service utilization that encompasses of resources acquired both before and after migration to a new country across several service domains.

This study addresses these issues not only by investigating refugees' service needs and actual utilization but also by focusing on social and human capital as potential predictors

<sup>1</sup> This study makes use of concept definitions from the public health literature: If a certain service is *available*, then the opportunity to *access* exists. The extent to which this access is gained is dependent on the ability to *overcome barriers*, which limit the *utilization* of these services. Thus, access is measured in terms of utilization (Gulliford et al., 2002).

of service utilization across a wide range of articulated needs. Employing data from the IAB-BAMF-SOEP Survey of Refugees (Brücker et al., 2016), a representative survey of the population of refugees who arrived in Germany between 2013 and 2016, provides the unique opportunity to identify the diversity in refugees service needs and differences in service utilization during the initial settlement experiences in Germany. The sample consists of 7662 refugees (mean age 33, 59.5% male) residing in Germany for, on average, 1.8 years. The main countries of origin include Syria, Afghanistan, and Iraq.

This research will investigate the following main research questions: What are refugees' professional support service needs, and how do they differ across service domains and the heterogeneous group of refugees in the sample? What is the relation between service needs and service utilization across eight domains of support services? And what is the impact of human and social capital on refugees' utilization of professional support services?

## **Support Needs of Refugees and the Landscape of Professional Services in Germany**

Although it is often argued that immigrants and refugees are selected upon in the migration process (Bevelander, 2011; Guichard, 2020; Kolb et al., 2019), they make up an extremely diverse group of individuals, each having different needs and requirements after arriving in a new context (Choi et al., 2015; Darawsheh et al., 2021; Pumariaga et al., 2005). However, existing research often focuses on specific subgroups of refugees when investigating service and support needs assuming that requirements are more similar. Choi et al. (2015), focusing on older Kurdish refugees in the USA, find needs for recreational and acculturation services such as game nights, picnics, dinners, or other social gatherings. Findings of a qualitative study on the experiences of refugees in tertiary education in Canada report a need for improvement in the areas of recognition of previously acquired qualifications, professional career support, and study advice (Bajwa et al., 2017). Another example stems from a project on young African immigrants and refugees finding articulated needs for trustworthy and ethno-specific organizations to facilitate their integration (Francis & Yan, 2016).

Even though these findings show that specific groups identify services related to their specific situation as predominantly important, the aforementioned studies furthermore report concordant needs that are unanimous across all ages, ethnicities, and SES groups. In general, refugees indicate a need for services related to their legal status such as assessment and referral; guidance in negotiating the social and service and health insurance bureaucracy; assistance in finding suitable housing, transportation, and child care; and services related to community connection and societal integration (Bajwa et al., 2017; Choi et al., 2015; Francis & Yan, 2016; Nakhaie, 2018).

## **Support Services in Germany**

A question unaddressed is what kind of services refugees implicitly refer to when being asked about support and assistance? A widely used simplification of various

types of support differentiates between formal and informal support (Cohen et al., 2000; Lipman & Longino, 1982). While the latter entails support provided by the family and social networks, this paper focuses on support services pertaining to the category of formal support. Formal, often labeled as professional, support entails help from a person, an organization, or a network that is trained in, or dedicated to, providing a specialized type of support regardless of a prior social connection. Thus, refugee-related professional support can be any public or privately organized body dedicated to assisting with issues that refugees are dealing with. Examples include governmental institutions, general immigration or asylum advice services, non-profit organizations, and religious or organized civil society actors (Gluns, 2018; Lyons & Zarit, 1999). In Germany, the level and type of public assistance, which is postulated in the “Asylum Seekers Benefits Act” (*Asylbewerberleistungsgesetz, AsylbLG*), is dependent on the refugee’s legal status and on their location in Germany<sup>2</sup>. Even though this act is enacted on the federal level, its implementation is delegated to the states and further down to the municipalities. Providing accommodation, financial benefits, means of basic education, and health care are the so-called mandatory and obligatory self-administrative tasks of the municipalities, while areas like language training, supporting societal integration, or further qualifications belong to the voluntary tasks, which municipalities can decide to engage in (Gluns, 2018; Schammann & Kühn, 2016).

The second-biggest share of professional assistance in Germany stems from privately organized civil society actors, including voluntary initiatives or religious institutions (Gluns, 2018; Hamann et al., 2016). Those initiatives provide assistance and help across all domains and, unlike public support, are theoretically accessible by all refugees, regardless of their legal status. This division of resources for potential support and different regulations depicts a complex and oftentimes confusing situation for those seeking help.

## Barriers to Support

The existence of several *barriers* hinders, if not prohibits, the utilization of the aforementioned services. Similar to knowledge about refugees’ service needs, research on barriers and the mismatch between needs and utilization is mostly qualitative, focusing on specific groups and services. Nevertheless, these findings can well portray the gap between current services and refugees’ support needs. Regardless of the topic of interest, certain barriers are worked out unanimously across all studies. These barriers can be distinguished into three broad categories: *Cultural*, *structural*, and *individual*.

Cultural barriers to support include a lack of trust toward the person in charge, which is an especially prominent finding among those refugees seeking help from a doctor or a government official (Essex et al., 2021; Kohlenberger et al., 2019). Perceived inequalities, discrimination, and general cultural insensitivity are other cultural barriers that hinder the utilization of support services as pointed out by Wang and Freeland (2004). Additionally, denomination and the lack of sensitivity toward

<sup>2</sup> Three types of status can be differentiated: Asylum seekers, individuals who were granted an exceptional leave to remain (*Duldung*), and recognized refugees.

the refugees' religious affiliation can foster further prejudice and mistrust (Nawyn, 2006). Perceiving and treating refugees as a homogenous mass and applying a "one-size-fits-all delivery model" (Francis & Yan, 2016: 82) disregards diversity in refugees' needs stemming from cultural differences, thus hindering respectful and trustful communication, which is especially essential in the domains of health care and in the subpopulation of young refugees (Bajwa et al., 2017; Graham et al., 2009; Kohlenberger et al., 2019; May, 2021).

Structural barriers refer to the uneven distribution of services and institutions across space. Being located far outside of the refugees' accommodations or communities and being inaccessible by public transportation constitute a structural barrier for service utilization (Francis & Yan, 2016; Graham et al., 2009; Minichiello, 2001). Additionally, services oriented to help refugees are oftentimes not well-advertised (Makwarimba et al., 2013). The aforementioned jungle of options and providers produces confusion and disorientation, which, in return, diminishes the likelihood that those in need find and utilize the services available to them (Choi et al., 2015).

Obstacles on the personal level can also act as barriers to support services. The most prominent example constitutes the language barrier,<sup>3</sup> which often rises when refugees, shortly after their arrival in a new country, seek help for multiple needs but do not yet speak nor understand the language of the host country (Bajwa et al., 2017; Choi et al., 2015; Makwarimba et al., 2013; Watkins et al., 2012). Stewart et al. (2008) show that language difficulties are the predominant factor explaining refugees support needs in the domains of job search, settlement aids, and medical services. Thus, the language literacy produces needs in nearly all domains while simultaneously acting as a barrier to utilize services that could assist with said needs. Lastly, stigma and shame associated with seeking help can prevent refugees from seeking it. Abe-Kim et al. (2007) found that stigma or fear-of-loss-of-face acts as constraint to service use among Asian immigrants in the USA. Some cultural groups attribute illnesses to internal flaws and are less likely to seek health services due to associated shame (van der Velde et al., 2009).

## The Role of Human Capital

The mismatch between service needs and utilization is largely dependent on factors facilitating or preventing utilization. Many of these facilitators can be assigned to the concepts of human capital and social capital. The existing literature on neighboring topics, such as the identification of service needs in general (Nakhaie, 2018), the outcome of procedures related to the legal status (Kosyakova & Brücker, 2020), and the employment experiences of the newly arrived (Gericke et al., 2018; Lamba, 2003), suggests that human and social capital are powerful predictors involving outcomes centered around the integration process of refugees.

<sup>3</sup> Missing language proficiency on the side of the service provider is also argued to be a reversed language barrier, if the provider does not speak the mother tongue of the refugee, English, or any other common language (e.g., Francis & Yan, 2016).

Human capital entails skills and knowledge that an individual acquires and uses for future returns (Mincer, 1978). Within this context, migration is considered an investment that involves costs and returns. Individuals or families decide to migrate only if the expected future returns exceed the costs of migration (Sjaastad, 1962). This however does not hold for refugees, since their experiences are shaped by forced displacement, limited decision-making capabilities, and most often distorted expectations about the future. Soontiens and Tonder (2014) thereby argue that human capital, due to a change in culture, language, and the economic system, generally transfers abroad only imperfectly. According to previous findings, former work experience, education, socio-economic status, and language proficiency are suitable proxies for predicting events (Kosyakova & Brücker, 2020; Lamba, 2003).

### **Educational Attainment and Socio-economic Status**

Education and SES are invariably positively correlated with desirable outcomes in the aforementioned studies (Graham et al., 2009; Kosyakova & Brücker, 2020; Lamba, 2003; Nakhaie, 2018). Being highly educated is associated with a better understanding of the bureaucratic system in general (Mood, 2006) and a better knowledge of existing rights and what services refugees are entitled to (Abrego, 2011). SES and education positively correlate with non-cognitive skills, such as communication skills, self-efficacy, or motivation, as well as cognitive abilities like problem-solving, intelligence, verbal abilities, and memorizing (Heckman et al., 2006). These abilities increase the likelihood of overcoming various barriers to service utilization. Therefore, higher educational attainment and SES are positively and significantly associated with service utilization, regardless of the service domain (H1).

### **Language Proficiency and Prior Work Experience in the Country of Origin**

Literacy of the host country's language is not only essential for utilizing support services but for the entire integration process. Overcoming the *language barrier* and achieving language proficiency is positively associated with a match of service needs and utilization. Alegria et al. (2007) find increased rates of service utilization among refugees with high language proficiency. Comprehension of the administrative language, articulating needs, and understanding service providers are key features of successful service utilization. Thus, higher language proficiency is positively and significantly associated with service utilization, regardless of the service domain (H2).

Previous work experience before arriving in a new country can be a favorable asset for overcoming barriers and facilitating the utilization of support services located in the area of job search. Research shows that previous work experience is positively associated with job search success (Russell & O'Connell, 2001) and, thus, it can be expected, that having worked before arriving in Germany also has a positive effect on the utilization of service related to finding employment. Furthermore, institutions assisting with finding jobs, most prominently the federal employment agency (*Jobcenter der Bundesagentur für Arbeit*), might be more in favor of helping somebody with enhanced

employability since previous experiences and qualifications make mediation simpler. Therefore, previous work experience in the country of origin is positively and significantly associated with service utilization in the domain of job search (H3).

## Social Capital and Networks

Social capital is the second facilitator known to enhance access to support services. Following social network theory, social capital is mostly described as being mobilized through the social network and related resources. The network describes a social structure composed of the individual's ties, including family, friends, neighbors, and acquaintances, whereas the resources portray what the person perceives to be available in terms of social support (Granovetter, 1973; Lin, 2017; Putnam, 2000). These skills, resources, and knowledge can activate awareness and facilitate access to services.

Research on social capital embedded in Granovetter's weak tie theory (1973) distinguishes between two kinds of social capital: bridging capital and bonding capital (Putnam, 2000). Social ties are connections among individuals used for sharing information, knowledge, and experiences. Classically, these can be weak or strong, depending on the extent and kind of exchanges between two nodes (mostly individuals). Strong ties are often established with people who share similar norms and values, such as the partner, nuclear family, or close friends, and are characterized by high mutual trust (bonding social capital). Bridging social capital occurs with weak ties, which are connections of weak trust and reciprocal behavior as they are ties between individuals who have less in common and come from different social groups. Bridging social capital has the advantage of providing bridges to information and resources outside of the individuals' own group, which, in the case of refugees, often comprises exclusive host community knowledge. Thus, it is positively associated with resource needs in the domain of employment or housing (Gericke et al., 2018; Granovetter, 1973). Relating this to the population of newly arrived refugees, multiple studies utilize this distinction to investigate different kinds of resources of social capital in host countries (Drever & Hoffmeister, 2008; Laurence, 2011; Lewis, 2021; Li, 2004). Within these studies, bonding social capital is associated with co-ethnic contacts, such as the family and people from the same country of origin, whereas bridging social capital relates to those with a different ethnic background, such as acquaintances from the host societies or any other ethnicity.

## Intra-ethnic Networks

Contradictory findings exist regarding the effect of family and friends from the same ethnic background on topics related to successful integration. Having a network of family and close friends is found to positively affect labor market participation of refugees (Aguilera & Massey, 2003; Drever & Hoffmeister, 2008; Gericke et al., 2018; Li, 2004). Moreover, literature on the utilization of medical services and health care reveals the importance of the social network as a facilitator of access (Morris et al., 2009; Stephan et al., 2018). Therefore, it can be assumed that the



intra-ethnic network is valuable when it comes to knowledge and information sharing. By having a close network of people being in the same position, collective problem-solving of integration-related issues minimizes barriers between service needs and providers, thereby increasing utilization (Ager & Strang, 2008; Choi et al., 2015; Nakhaie, 2018). Summarizing, having an intra-ethnic network is positively and significantly associated with service utilization, regardless of the service domain (H4a).

However, Nannestad et al. (2008) show that being closely bonded to the intra-ethnic network migrants are severely limited in their pool of accessible resources and information. By surrounding themselves with people with identical knowledge and unresolved needs, refugees might miss out on important information communicated outside their intra-ethnic sphere. Additionally, they are unable to benefit from the cultural knowledge of the host society, which is most often brought to them through contact with the majority population. Nakhaie (2018) shows that family networks increase the need for community access and integration. This can result in negative long-term effects, such as negative economic outcomes, occupational downgrading, or isolation (Allen, 2009; Cederberg, 2015). Therefore, the counter hypothesis states that having an intra-ethnic network is negatively and significantly associated with service utilization, regardless of the service domain (H4b).

### Inter-ethnic Networks

Focusing on the social network outside of the own ethnic community, having a network native to the society that one wants to integrate into can provide valuable insider information and host community knowledge (Cederberg, 2015). Research shows that mentoring programs with German natives improve refugee's language skills and overall increase their participation in the host society (Krieger et al., 2020). Profiting from cultural knowledge and being able to communicate topics with friends native to the language, culture, bureaucratic system, and idiocrasies can increase utilization of services in all kinds of domains. Thus, having an inter-ethnic network is positively and significantly associated with service utilization, regardless of the service domain (H5).

Additionally, following the tradition of Granovetter (1973), weak social ties have the advantage of providing information from outside spheres, which makes bridging social capital especially valuable for providing career-related information. Gericke et al. (2018), Lancee (2016), and Hartmann and Steinmann (2020) confirm that having friends in the majority population increases successful labor market integration. Therefore, having an inter-ethnic network is positively and significantly associated with service utilization in the domain of job search (H6).

### Data and Methods

The empirical analysis is based on the IAB-BAMF-SOEP Survey of Refugees in Germany (v.36), which monitors people in Germany seeking protection from political persecution and violent conflicts since 2016 (Brücker et al., 2016). The survey is conducted by the Institute for Employment Research (IAB), the Socio-Economic Panel

(SOEP) at the German Institute for Economic Research (DIW Berlin), and the Research Centre on Migration, Integration, and Asylum of the Federal Office for Migration and Refugees (BAMF-FZ). The sampling population consists of refugees who arrived in Germany between 2013 and 2016, with respondents drawn from the Central Register of Foreign Nationals that includes all foreigners in Germany. Information on the dependent variables is only captured during the initial interview. Thus, the models are built on a pooled cross-sectional sample. The sample utilizes all available waves (2016, 2017, 2018, 2019) and the initial sample contains  $N=8320$  observations. The working sample ( $N=7680$ ) excludes respondents who report having arrived before 2013 or have an unknown arrival date (412 cases); have missing information regarding the legal status (145); or have reported no service needs, met or unmet at all (83). Further deletion of entirely missing observations (18) in the dependent variables leads to a final sample size of  $N=7662$ .<sup>4</sup> Partially missing observations in the dependent variable and all other variables of interest were imputed using multiple imputation.<sup>5</sup>

Additionally, eight separate subsamples per service domain are made up of respondents who indicated a need for a service in the given domain. To test the hypotheses proposed, binary logistic regressions were applied. The regression models are calculated separately per service domain.

As previously described, all proxies for human capital contain information that relates to the completed life trajectory “life before migration.” In contrast, the variables predicting social capital (post-migration) are exclusive to the post-migration phase and are thereby dependent on previous experiences and gained resources. To account for this hierarchical causal structure in the data, nested regression models are constructed. Predictors of social capital (post-migration resources) are adjusted for predictors of human capital (post-migration resources), which themselves remain unadjusted. By nesting pre-migration variables into post-migration ones, the model accounts for the circumstance that resources acquired after the arrival in Germany might be the result of previous (potentially gender specific) trajectories of education, language literacy, labor market participation, or socio-economic status in the country of origin.

To summarize, the central parameters representing the quantities of interest from the derived hypotheses are the regression coefficients  $\beta$ . They estimate the association of predictors of human capital (language, education, work experience, SES) and service utilization ( $Y_{\text{Use}, 1}$ ).

$$P(Y_{\text{use},1} = 1) = [\exp(-(\beta_0 + \beta_{1-3}\text{Language}_{\text{low,medium,high}} + \beta_{4-7}\text{Education}_{\text{no,primary,sec.,tertiary}} + \beta_8\text{Work experience} + \beta_{9-11}\text{SES}_{\text{low,medium,high}} + X_{\text{controls}})) + 1]^{-1} \quad (1)$$

<sup>4</sup> For a detailed overview of sample reduction before analysis, see Appendix Table 4. For a comparison of summary statistics between the final sample and deleted observations due to no indication of service needs, see Appendix Table 5. Comparing weighted means shows no differences between both samples and the deletion is therefore unrelated to predictors in the sample.

<sup>5</sup> Multiple imputations were carried out using the *mice* package in R 3.5.0 (van Buuren & Groothuis-Oudshoorn, 2011). Fifty alternative datasets were produced using 30 iterations. For a detailed overview of the imputed datasets per regression, see Appendix Table 6.

Equation (1) thereby depicts the unadjusted model postulating the association of the parameters representing pre-migration resources and service utilization ( $Y_{Use, 1}$ ).

$$P(Y_{use,2} = 1) = [exp(-(\beta_0 + \beta_{1-3}Language_{low,medium,high} + \beta_{4-7}Education_{no,primary,sec.,tertiary} + \beta_8Work\ experience + \beta_{9-11}SES_{low,medium,high} + \beta_{12-15}Family_{no,1,2,3} + \beta_{16-19}Intra\ ethnic_{no,small,medium,large} + \beta_{20-23}Inter\ ethnic_{no,small,medium,large} + X_{controls})) + 1]^{-1} \quad (2)$$

The predicted probability of service utilization ( $Y_{Use, 2}$ ) for the adjusted model containing the entire set of parameters is shown in Eq. (2). All models contain a matrix of control variables  $X_{Controls}$ .

## Service Needs and Utilization

Multiple dependent variables containing information on service needs and service utilization were constructed. The basis of these are eight survey questions on the need for and utilization of professional services regarding (1) legal advice, (2) learning German, (3) job search, (4) education, (5) recognition of qualifications, (6) housing, (7) medical care, and (8) finances. Eight separate dummy variables contain information on the need for professional support in a given domain (no = 0, yes = 1) and an additional eight dummy variables indicate whether or not a specific service was utilized (yes = 1, no = 0).<sup>6, 7</sup> For descriptive purposes, three discrete variables (min. 0, max. 8) count the number of overall service needs, the number of utilized services (met needs), and, by subtracting these two, calculates the number of unmet needs.

## Human and Social Capital

Human capital is measured with four variables: Educational attainment, work experience in the country of origin, subjective socio-economic status in the country of origin, and language proficiency. *Educational attainment* is a categorical measure of the highest obtained educational degree in the country of origin and differentiates between (1) no education or less than primary education, (2) primary, (3) secondary, and (4) tertiary education (4). *Previous work experience* is captured by a dummy variable indicating whether the respondent has ever officially worked before arriving in Germany (1 = yes, 0 = no). A categorical variable reports the *perceived socio-economic status in the country*

<sup>6</sup> For additional details on the question phrasing and construction of the dependent and independent variables, see Appendix Table 10.

<sup>7</sup> Dummy variables per service utilization are based on the corresponding subsample indicating a need for the support service.

of *origin* based on the subjective socio-economic status and financial situation relative to the population (1 = worse than average, 2 = average, 3 = better than average). Lastly, *language literacy* is a categorical variable capturing the overall language proficiency consisting of self-reported writing, reading, and reading skills on a scale from 1 = low and 2 = medium to 3 = high. Since reporting German language proficiency would causally intervene with the utilization of the support service “learning the German language,”<sup>8</sup> the variable language proficiency includes the aforementioned skills in the native language, the official language of the country, and English (each, if different). According to the theory of destination-language acquisition, better literacy of the mother tongue and other languages largely contributes not just to an easier understanding of new vocabulary, grammar, and structure but also an overall better acquisition of new languages (Chiswick & Miller, 2001). This approach was successfully employed in a study of the effect of human and social capital on asylum procedure outcomes in Germany (Kosyakova & Brücker, 2020). Assuming that the level of language proficiency has not changed since migration, all proxies for human capital exclusively contain information previous to the arrival in Germany.

Three variables proxy the respondents' social capital. As mentioned before, capturing refugees' social capital should distinguish between inter- and intra-ethnic networks, which provide bonding and bridging capital respectively. Thereby, the number of family members in Germany and the size of the intra-ethnic network cater to the first and the size of the inter-ethnic network refers to the second kind of social capital. Since the survey provides detailed information on the structural kinship network and the whereabouts of each member of the family, a variable on the *number of family members in Germany* report how many members of the nuclear family reside in Germany. The nuclear family thereby entails the partner or spouse as well as parents.<sup>9</sup> Each family member, if existent, is assigned 1 if he or she lives (i) together with the respondent in the same home, (ii) in the same city but different household, or (iii) elsewhere in Germany or 0 if he or she lives (iv) in the country of origin or (v) elsewhere abroad. The sum of family members is then divided into four categories (1 = no member of the nuclear family in Germany, 2 = one member, 3 = two members, or 4 = three members). Secondly, the variables on *intra- and inter-ethnic network size* each provide four categories of network size (1 = no network, 2 = small (1–3 persons), 3 = medium (4–6), 4 = large (7 or more)) constructed from a continuous measure of the number of new friends and acquaintances made since arriving in Germany. Summarizing, all proxies for social capital contain information dependent on the post-migration status.

<sup>8</sup> This alternative is necessary as German proficiency is most likely an outcome of service utilization in the domain of “learning German” and therefore not a suitable proxy in a cross-sectional sample.

<sup>9</sup> Unfortunately, the item on the existence and whereabouts of siblings does not allow for differentiating the location of each individual siblings and, thus, is unsuitable.

## Controls

Additional factors are likely to influence support service utilization. Legal status is a categorical variable indicating the respondent's *current legal status*<sup>10</sup> (1 = in process, 2 = recognized, 3 = tolerated, 4 = other). Since the legal right to federal services, such as support with job search or support with learning German, is dependent on the refugee's legal status,<sup>11</sup> the access and utilization of services are not expected to be equal across all groups of legal status. Although utilization of non-federal services is open to all refugees, these providers are often centered in bigger cities or do not have the capacities to cater for all needs and refugees. The time in Germany is measured with a categorical variable *time since arrival* (1 = less than a year, 2 = 1–1.5 years, 3 = 1.5–2 years, 4 = more than 2 years). This measure potentially affects service utilization, as it could either increase or decrease with additional years spent in Germany. The need for and utilization of support could be biggest in the beginning. On the other hand, being able to access and use services is more likely with time spent in Germany, as resources grow, which facilitate access. All models include the region of origin of the respondent (1 = Syria, 2 = Afghanistan, 3 = Iraq, 4 = African countries, 5 = other) and age groups (1=17–25 years, 2=26–35 years, 3=36–45 years, 4 > 45 years). Lastly, gender is captured by a dummy variable (0 = male, 1 = female).

## Results

### Descriptive Statistics of Independent Variables

Results show that, on average, 27% of the respondents do not have any members of their nuclear family living in Germany and almost 57% have the partner, mother, or father living in the country (Table 1). Furthermore, 30% of refugees indicate having a large network of inter- or intra-ethnic friends. More than half of the sample has either a primary, secondary, or tertiary educational degree. Some 70% of the respondents in the sample report medium or high language proficiency and almost 65% have previous work experience. The self-reported measure of the socio-economic situation indicates that almost 75% experienced an average or better SES than the average population in the country of origin.

<sup>10</sup> In process = residence permission following § 55 German Asylum Act; Recognized = residence permit following § 25 Para. 1 / § 25 Para. 2 / § 26 Para. 3 / § 22 or § 23 Residence Act; Tolerated = following § 60a Residence Act; other = residence permit following § 23a or § 25 Para. 3, 4 or 5 Residence Act as well as other humanitarian reasons.

<sup>11</sup> Being tolerated results in either no or a severely limited working permit, with participation in language courses is only possible if free places are available (see paragraphs above).

**Table 1** Descriptive statistics of variables of interest

Variables	Mean	sd
Number of nuclear family members in Germany		
None	0.276	0.447
1 member	0.566	0.496
2 members	0.114	0.318
3 members	0.044	0.206
Size of intra-ethnic network		
No network	0.220	0.414
Small	0.259	0.438
Medium	0.219	0.414
Large	0.302	0.459
Size of inter-ethnic network		
No network	0.237	0.425
Small	0.233	0.423
Medium	0.238	0.426
Large	0.293	0.455
Educational attainment		
No education	0.419	0.493
Primary education	0.231	0.422
Secondary education	0.176	0.381
Tertiary education	0.174	0.379
Language proficiency		
Low	0.303	0.460
Medium	0.412	0.492
High	0.285	0.452
Work experience in country of origin	0.649	0.477
SES in country of origin		
Worse than average	0.252	0.434
Average	0.474	0.499
Better than average	0.274	0.446

Further description of control variables are found in Appendix Table 7

## The Distribution of Service Needs and Service Utilization

Respondents reported an average need for 6 out of 8 services, with roughly 4 met and 2 unmet needs (Table 2). More than 90% of respondents indicated a need for support to learn the German language. The share of those requiring help in the domains of financial support and medical care was equally high at 89% and 85%, respectively. Approximately one-third of the sample indicated a need for help to get previously acquired degrees and qualifications recognized. Investigating these needs further, it is clear that additional support not only varies between service domains

**Table 2** Descriptive statistics on service need domains and utilization

	Mean	sd	Min	Max
Total number of service needs	5.511	1.747	1	8
Total number of met service needs	3.556	1.671	0	8
Total number of unmet service needs	1.955	1.899	0	8
Domains of service needs	Indication of service need <i>n</i> <sup>a</sup> (% of total sample <sup>b</sup> )	Utilization of service <i>n</i> (% of subsample)		
Medical care	6342 (84.55)	5830 (91.93)		
Financial situation	6676 (88.92)	6131 (91.73)		
Learning German	6835 (91.04)	4938 (72.18)		
Search for housing	6304 (83.71)	4298 (68.24)		
Legal advice	3984 (55.12)	2094 (52.61)		
Education, vocational training	3515 (47.63)	1753 (49.91)		
Job search	3710 (50.89)	1226 (29.95)		
Recognition of qualifications	2528 (34.56)	811 (32.07)		

<sup>a</sup>Subsample size for each indication of a service need

<sup>b</sup>The total sample size for each service domain including only complete cases can be found in Appendix Table 6

but also between different levels of human and social capital predictors as well as socio-demographic characteristics.

Turning to the actual utilization of professional support services, services in the domains of medical care and finances rank highest, at .91 and .92, respectively. On average, less than 10% of refugees in the sample who indicated a need for support in these domains did not utilize a corresponding service. The share of those having utilized support in the domains of job search and the recognition of previously acquired degrees and qualifications is very low, averaging 3 out of 10 respondents. This shows that not only is the need for additional support distributed unequally across domains, but actual utilization is also dependent on the domain of service. This becomes even more apparent when investigating the characteristics of predicting variables.<sup>12</sup> For example, disentangling the utilization of services in the domain of job search (overall utilization of 0.3) among different levels of language proficiency, it becomes clear that those with high language proficiency report an overall higher utilization (0.39) than those with low language proficiency (0.19).

### Findings on Service Utilization by Domain

Table 3 shows the average marginal effects and standard errors of a binary logistic regression for each professional support service separately. The binary dependent variable *service utilization* depicts whether the service in a certain domain

<sup>12</sup> For a detailed overview of service needs and utilization by predicting and control variables (row percentages), see Appendix Table 8.

**Table 3** Association between 8 domains of service utilization and predictors (nested logistic regression with AME and S.E.)

DV: Utilization in the domain of	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	Legal advice	Learning German	Job search	Education	Recognition of qualifications	Search for housing	Medical care	Financial situation
	AME (S.E.)	AME (S.E.)	AME (S.E.)	AME (S.E.)	AME (S.E.)	AME (S.E.)	AME (S.E.)	AME (S.E.)
Educational attainment (ref. no education)								
Primary education	<b>0.052**</b> (0.022)	<b>0.045**</b> (0.015)	<b>0.055**</b> (0.020)	0.031 (0.023)	0.029 (0.028)	<b>0.057***</b> (0.017)	<b>0.023*</b> (0.010)	0.006 (0.010)
Secondary education	0.030 (0.025)	<b>0.049**</b> (0.017)	0.033 (0.024)	0.015 (0.026)	<b>0.081**</b> (0.028)	0.006 (0.019)	0.017 (0.012)	-0.011 (0.011)
Tertiary education	-0.001 (0.027)	<b>0.097***</b> (0.019)	0.035 (0.025)	-0.040 (0.028)	<b>0.134***</b> (0.027)	-0.001 (0.020)	<b>0.030*</b> (0.013)	<b>0.027*</b> (0.013)
Language proficiency (ref. low)								
Medium	-0.014 (0.020)	<b>0.036**</b> (0.013)	0.021 (0.020)	0.036 (0.023)	0.016 (0.029)	<b>-0.037*</b> (0.015)	0.004 (0.009)	-0.005 (0.009)
High	0.012 (0.025)	<b>0.085***</b> (0.017)	<b>0.071**</b> (0.024)	<b>0.05*</b> (0.026)	<b>0.123***</b> (0.030)	-0.024 (0.019)	-0.018 (0.011)	-0.022 (0.011)
Work experience in country of origin (ref. no)	0.027 (0.021)	<b>0.032*</b> (0.014)	<b>0.093***</b> (0.022)	-0.002 (0.021)	-0.019 (0.023)	-0.012 (0.016)	-0.008 (0.010)	-0.006 (0.010)
SES in country of origin (ref. below average)								
Average	0.031 (0.020)	0.012 (0.016)	0.030 (0.020)	0.017 (0.021)	<b>0.064*</b> (0.027)	0.005 (0.015)	0.005 (0.009)	0.011 (0.009)
Above average	0.031 (0.023)	0.017 (0.013)	<b>0.056*</b> (0.022)	0.036 (0.025)	0.030 (0.025)	-0.011 (0.017)	-0.003 (0.010)	-0.011 (0.010)
Nagelkerke $R^2$	0.032	0.099	0.110	0.0810	0.171	0.048	0.051	0.031
McFadden $R^2$ (adj.)	0.008	0.054	0.055	0.0343	0.088	0.021	0.025	0.010



Table 3 (continued)

DV: Utilization in the domain of	Model 1 Legal advice		Model 2 Learning German		Model 3 Job search		Model 4 Education		Model 5 Recognition of qualifications		Model 6 Search for housing		Model 7 Medical care		Model 8 Financial situation	
	AME	(S.E.)	AME	(S.E.)	AME	(S.E.)	AME	(S.E.)	AME	(S.E.)	AME	(S.E.)	AME	(S.E.)	AME	(S.E.)
Number of family members in GER (ref. none)																
1 member	<b>0.044*</b>	(0.019)	-0.021	(0.013)	-0.017	(0.018)	-0.030	(0.021)	<b>-0.049*</b>	(0.022)	<b>0.098***</b>	(0.014)	0.016	(0.009)	<b>0.023**</b>	(0.009)
2 members	<b>0.073*</b>	(0.031)	0.033	(0.021)	-0.005	(0.027)	<b>0.058*</b>	(0.028)	0.004	(0.031)	<b>0.093***</b>	(0.022)	0.027	(0.014)	0.013	(0.013)
3 members	0.063	(0.042)	-0.037	(0.028)	-0.012	(0.038)	0.000	(0.042)	0.004	(0.031)	<b>0.093***</b>	(0.022)	0.027	(0.014)	0.013	(0.013)
Intra-ethnic network size (ref. no network)																
Small	-0.041	(0.024)	-0.026	(0.015)	-0.034	(0.023)	-0.046	(0.026)	<b>-0.096***</b>	(0.028)	-0.012	(0.018)	-0.017	(0.010)	0.001	(0.010)
Medium	-0.001	(0.025)	0.013	(0.016)	<b>-0.051*</b>	(0.024)	<b>-0.061*</b>	(0.027)	-0.043	(0.028)	0.004	(0.018)	-0.005	(0.011)	0.014	(0.011)
Large	0.040	(0.024)	-0.001	(0.016)	<b>-0.064**</b>	(0.022)	-0.023	(0.025)	-0.046	(0.026)	-0.005	(0.018)	0.004	(0.011)	0.009	(0.011)
Inter-ethnic network size (ref. no network)																
Small	0.041	(0.024)	<b>0.094***</b>	(0.015)	<b>0.061*</b>	(0.025)	0.047	(0.027)	0.052	(0.030)	<b>0.041*</b>	(0.017)	<b>0.024*</b>	(0.010)	-0.001	(0.011)
Medium	0.035	(0.024)	<b>0.140***</b>	(0.015)	<b>0.114***</b>	(0.024)	<b>0.120***</b>	(0.026)	<b>0.065*</b>	(0.029)	<b>0.084***</b>	(0.017)	<b>0.035***</b>	(0.010)	0.003	(0.011)
Large	<b>0.141***</b>	(0.023)	<b>0.178***</b>	(0.015)	<b>0.198***</b>	(0.023)	<b>0.159***</b>	(0.025)	<b>0.096***</b>	(0.028)	<b>0.117***</b>	(0.017)	<b>0.068***</b>	(0.011)	0.015	(0.011)
Nagelkerke $R^2$	0.059		0.135		0.141		0.105		0.186		0.071		0.073		0.036	
McFadden $R^2$ (adj.)	0.021		0.074		0.070		0.045		0.092		0.033		0.036		0.009	
N	4418		6989		4082		3797		2876		6435		6503		6830	

Average marginal effects; standard errors are shown in parentheses; results of control variables not shown; \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$   
 Nested models; social capital predictors are adjusted for human capital predictors (indicated by dashed line; full models in Appendix Table 9)

was utilized. Each model consists of a subsample including respondents who have reported the need for assistance in the respective category. The average marginal effect thereby depicts the average change in the probability to utilize a given support service by a given unit change in a predictor variable.

I hypothesize that additional educational attainment and a higher SES are positively associated with service utilization, regardless of the service domain (H1). Seven out of eight models provide evidence for this hypothesis. All domains, except for services related to education, are positively and significantly associated with educational attainment. This effect could only partially be found for socio-economic status, namely in the domains of job search and the recognition of qualifications. Having had an SES above average in the country of origin is associated with increased probability of service utilization in the domain of job search and the recognition of qualifications (5.6%, 6.4%, respectively). These results are statistically significant. Therefore, H1 can only partially be supported by the findings.

H2 states that higher language proficiency is also positively associated with service utilization, regardless of the service domain. Four domains of professional support services support this hypothesis. Having high or medium language skills compared to low skills is significantly associated with an increased probability of service utilization in the domains of learning German (8.5%), job search (7.1%), education (5.5%), and the recognition of qualifications (12.3%). Surprisingly, having a medium compared to a low language literacy is negatively associated with utilizing housing-related support services by 3.7 percentage points. Therefore, H2 can also be partially supported.

The last hypothesis on the positive relationship between predictor of human capital and service utilization pertains to the positive association between previous work experience in the country of origin and service utilization in the domain of job search (H3). Compared to refugees with no work experience in their country of origin, those with experience have an increased probability of utilizing services in the area of search for work (9.3%). This finding is statistically significant and, thus, supports H3.

Turning to the claims of a positive association between predictors of social capital and service utilization, as proposed, the relationship between the intra-ethnic network and service utilization might be either positive (H4a) or negative (H4b). This network is proxied by two sets of variables, namely the number of close family members in Germany and the size of unrelated intra-ethnic friends. Results show that these two groups of networks are differently associated with service utilization. On the one hand, having additional members of the nuclear family residing in Germany is positively and significantly associated with an increased probability of service utilization in the domains of legal advice, financial advice, and search for housing. Having the partner as well as both parents living in the same country is associated with an increased probability of utilizing services related to housing by 13 percentage points. However, on the other hand, the findings show that a larger intra-ethnic network is associated with a decrease in utilization in several domains. These results provide support for both competing hypotheses, thus calling for a detailed interpretation of differences in the mechanisms of intra-ethnic networks on different service domains.

Lastly, H5 and H6 propose a positive association between a larger inter-ethnic network and support service utilization regardless of the service domain, with a particularly strong impact in the domain of job search. Model 3 provides support for

H6, since having either a small, medium, or large network of friends and acquaintances with a different ethnic background compared to none is positively and significantly associated with utilization of services in the domain of search for work. The effect size increases with increasing network size and is significant across all categories. Additionally, the fact that the association between a bigger inter-ethnic network and service utilization is positive and statistically significant supports H5 in all domains except for one. Compared to refugees with no friends from a different ethnic background, refugees with seven or more friends have an increased probability of using housing and accommodation-related services (12%), medical care services (7%), or services providing legal advice (14%).

## Discussion

In general, this study supports previous findings on the multitude and diversity of identified service needs among refugees (Choi et al., 2015; Pumariega et al., 2005). Refugees in the sample indicate having, on average, service needs in 6 out of the 8 presented domains. On average, across the entire sample, 4 of these needs were met by utilizing a suitable support service, while 2 needs remain unmet. Differentiating these by domain, the lowest identified rate of utilization was 30% with needs related to job search and the recognition of degrees and qualifications. This is also in line with Choi et al. (2015) finding high rates of under-utilization. This paper further provides evidence that human and social capital are generally beneficial for overcoming barriers to support services but highly differ when investigated separated by domain. In particular, especially high language proficiency was associated with an increase in service utilization in nearly all domains (H2). Assuming that the chosen proxy for better language skills, which was knowledge of the mother tongue as well as English, translates into the easier acquisition of the German language, this finding is in line with previous evidence on language literacy (Alegria et al., 2007; Makwarimba et al., 2013; Stewart et al., 2008; Watkins et al., 2012). While additional educational attainment is positively associated with service utilization across almost all domains (H1), previous work experience is found to be especially helpful in overcoming barriers to support services in the domain of job search (H3). This provides support for the assumption that having already worked in the country of origin equips an individual with knowledge of where to find and access help to re-enter the labor market.

Access to services on job search was additionally facilitated by an inter-ethnic network (H6). Having connections to those outside of the sphere of refugees such as Germans or migrants from other countries provides information and exclusive host community knowledge on services that assist with finding employment. This is in line with previous evidence on the matter (Gericke et al., 2018; Lancee, 2016). Overall, having friends from the own ethnic background is associated with hindering the utilization (H4b), while a network of inter-ethnic connections facilitates service utilization. This underlines the widely stated and supported assumption that stepping outside of the refugee sphere is associated with an accelerated and more successful social and economic integration (e.g., Cederberg, 2015). Thereby, bridging social capital acts as a structural link transmitting exclusive cultural knowledge (Nakhaie, 2018).

Lastly, the family plays an important role, not only in generally maximizing service utilization but especially in specific service domains. Choi et al. (2015) find the family to be important for providing living accommodations as well as money. Transferring this direct help to indirect assistance with receiving external help, this study finds identical evidence. Family is positively associated with service utilization, especially in the domains of housing and finances (H4a). Bonding social capital, in line with the stress reduction model (Hirayama et al., 1993), strengthens the co-ethnic support network, increases coping skills, reduces the stress of migration, and helps with finding necessary services (Nakhaie, 2018).

Providing results for Germany like these can assist in the program development and the design of related services for those in need. The results particularly highlight the need for the implementation of language-sensitive measures, such as additional translators. Drawing on the positive influence of inter-ethnic networks, the extension of culture-specific programs, as suggested by Francis and Yan (2016), can maximize service utilization by increasing trust, eliminating the language barrier, and providing community support. Slobodin et al. (2018) are developing a culturally sensitive mental health intervention for refugees in the Netherlands. Their pilot study already highlights the need for interventions to reach beyond the medical trauma-focused approach and acquire community knowledge to treat refugees to prevent the underutilization of needed services due to shame, guilt, anxiety, and fear of negative stigma (Slobodin et al., 2018). Additionally, de Jong (2019), analyzing migration support organization, reports a positive effect of employing individuals speaking migrants' native language on successfully matching services to needs.

Some limitations to the present study should be noted. A causal relationship between predictors of social capital and utilization of services cannot be established. While predictors of human capital are pre-migration resources, social capital is based upon the number of family members in Germany and the size of the intra- and inter-ethnic network. It might be the case that access to legal services concerned with family reunion increases the likelihood of additional family members entering Germany. A similar mechanism could be an increased network of friends through utilizing German language courses or other support groups. Additionally, the measure of service needs does not provide information on the intensity and frequency of service needs nor does it give additional information on the kind of service provider utilized. Furthermore, it is unknown if a service was not used because the services did not exist in the daily activity space of the respondent or because they chose not to access it. Due to the described multi-layered structures of public and private service institutions across Germany, the study is not able to include this information.

A last limitation of the given data is the observed time frame, which only depicts the first couple of years after the arrival in Germany. Refugees in the sample have been residing in Germany for, on average, 1.5 years. It is therefore likely that service needs and the actual utilization develop over time, as different services gain or lose importance depending on the stage in the integration process. Similarly, post-migration resources, especially the inter-ethnic network, will grow over time and impact service needs and utilization. Additional friends might render some domains of external support unnecessary, while access to other services will further be facilitated through a growing network in later years.

Despite these limitations, this paper illustrates not only the broad differences in service needs and service utilization across refugees and across domains but also the gap between them, thus shedding light on how different predictors of human and social capital facilitate service utilization in certain domains.

## Conclusion

The aim of this paper is threefold: (1) to examine refugees' professional support service needs and actual utilization across eight different service domains and a broad range of socio-economic and -demographic characteristics; (2) to investigate if predictors of social and human capital are associated with refugees' support service utilization; and (3) whether this association differs concerning specific service domains. Using pooled data from all available waves of the IAB-BAMF-SOEP Survey of Refugees (2016–2019), it is clear that the articulated support service needs of refugees during their initial settlement period in Germany do not just differ greatly between service domains but are also diverse concerning different characteristics describing resources acquired before and after migrating to Germany. Additionally, the same can be said for the reported actual utilization of said services. Utilization rates differ highly between domains and overall, those scoring lower on socio-economic and -demographic characteristics report successful utilization less often.

All in all, the findings of this study accentuate the need to acknowledge the diversity of refugees' service needs as well as the barriers to service utilization. The current system, as complex and multi-layered it might seem, provides access exclusively to the well-educated and well-connected. Support services in Germany should be continuously adapted and tailored to the needs and realities of refugees to better fulfill their role as providers of settlement support.

## Appendix

**Table 4** Deletion of missing observations to retain working sample

Deletion step	Retained N	% of initial sample
Initial refugee sample (restriction= 1 <sup>st</sup> observation)	8320	100
Date of arrival missing	8066	96.95
Arrival before 2013	7943	95.47
Date of interview before date of arrival	7908	95.05
Year of birth missing	7906	95.03
Legal status missing	7763	93.31
Information on all 8 service domains missing	7745	93.09
No indication of service need	7662	92.09

**Table 5** Mean comparison: final sample (1) and deleted cases of "no indication of service need" (2)

Variables	Final sample		"No indication of service need"	
	Mean	sd	Mean	sd
<i>N</i> (unweighted)	7662		83	
Number of nuclear family members in Germany				
None	0.257	0.437	0.276	0.447
1 member	0.483	0.500	0.566	0.496
2 members	0.175	0.380	0.114	0.318
3 members	0.085	0.280	0.044	0.206
Size of intra-ethnic network				
No network	0.164	0.371	0.220	0.414
Small	0.262	0.440	0.259	0.438
Medium	0.227	0.419	0.219	0.414
Large	0.347	0.476	0.302	0.459
Size of inter-ethnic network				
No network	0.201	0.400	0.237	0.425
Small	0.217	0.412	0.233	0.423
Medium	0.245	0.430	0.238	0.426
Large	0.338	0.473	0.293	0.455
Educational attainment				
No education	0.391	0.399	0.419	0.493
Primary education	0.273	0.432	0.231	0.422
Secondary education	0.181	0.430	0.176	0.381
Tertiary education	0.155	0.331	0.174	0.379
Language proficiency				
Low	0.245	0.430	0.303	0.460
Medium	0.414	0.493	0.412	0.492
High	0.341	0.474	0.285	0.452
Work experience in country of origin	0.611	0.435	0.649	0.477
SES in country of origin				
Worse than average	0.268	0.443	0.252	0.434
Average	0.465	0.499	0.474	0.499
Better than average	0.267	0.442	0.274	0.446

*N*=83 cases dropped due to no indication of required service

**Table 6** Multiple imputation on the dependent variables

	Complete cases in each subsample (Employed in descriptive analysis)	Missing cases/cases imputed using multiple imputation	Imputed dataset <sup>a</sup> (Employed in inferential analysis)
Legal advice	3984	434	4418
Learning German	6835	154	6989
Job search	3710	372	4082
Education, vocational training	3515	282	3797
Recognition of qualifications	2528	348	2876
Search for housing	6304	131	6435
Medical care	6342	161	6503
Financial situation	6676	154	6830

Complete cases in each subsample are conditioned on the indication of a service need in the given domain

<sup>a</sup>All independent and control variables were included as predictors in the imputations

**Table 7** Descriptive statistics of control variables

Variables	Mean	sd
Age		
17–25	0.298	0.457
26–35	0.312	0.463
36–45	0.234	0.424
46 and older	0.156	0.363
Female	0.406	0.491
Time since arrival		
Less than a year	0.143	0.350
1–1.5 years	0.286	0.452
1.5–2 years	0.248	0.432
2 years or longer	0.323	0.468
Legal status		
In process	0.272	0.445
Recognized	0.626	0.484
Tolerated	0.059	0.235
Other	0.044	0.205
Region of origin		
Syria	0.511	0.500
Afghanistan	0.131	0.337
Iraq	0.139	0.346
African countries	0.090	0.286
Other countries	0.130	0.336
Survey year		
2016	0.546	0.498
2017	0.369	0.482
2018	0.052	0.223
2019	0.033	0.180

**Table 8** Row percentages of need for and utilization in 8 domains

	Legal advice	Learning German	Job search	Education
Overall need for service:	3984/7662 = 0.52	6835/7662 = 0.89	3710/7662 = 0.48	3515/7662 = 0.46
Overall utilization of service:	2094/3984 = 0.53	4938/6835 = 0.72	1226/3710 = 0.33	1753/3515 = 0.50
Need (N) and utilization (U) by variables:				
	U (of 2094)	N (of 6629)	U (of 4769)	N (of 3642)
			U (of 1146)	U (of 1675)
Educational attainment				
No education	0.54	0.89	0.66	0.46
Primary education	0.57	0.93	0.73	0.53
Secondary education	0.53	0.90	0.75	0.52
Tertiary education	0.52	0.93	0.81	0.54
Language proficiency				
Low	0.53	0.88	0.65	0.46
Medium	0.55	0.92	0.71	0.50
High	0.54	0.93	0.79	0.55
Work exp. in country of origin				
No	0.51	0.88	0.68	0.33
Yes	0.56	0.93	0.74	0.59
SES in country of origin				
Below average	0.57	0.89	0.68	0.50
Average	0.54	0.92	0.72	0.49
Above average	0.53	0.92	0.75	0.51
Family members in GER				
None	0.61	0.94	0.74	0.58
1 member	0.53	0.90	0.70	0.47
2 members	0.45	0.91	0.79	0.46
3 members	0.50	0.89	0.70	0.47



**Table 8** (continued)

Intra-ethnic network size									
No network	0.53	0.48	0.88	0.67	0.46	0.30	0.42	0.48	
Small	0.54	0.46	0.91	0.69	0.50	0.30	0.46	0.46	
Medium	0.54	0.51	0.92	0.75	0.47	0.31	0.46	0.47	
Large	0.56	0.57	0.93	0.76	0.55	0.33	0.53	0.53	
Inter-ethnic network size									
No network	0.51	0.44	0.87	0.58	0.44	0.20	0.37	0.40	
Small	0.51	0.48	0.91	0.70	0.45	0.25	0.43	0.43	
Medium	0.56	0.48	0.92	0.76	0.51	0.32	0.50	0.51	
Large	0.59	0.60	0.94	0.80	0.58	0.42	0.56	0.55	
Age									
17–25	0.54	0.50	0.92	0.76	0.49	0.35	0.62	0.57	
26–35	0.57	0.52	0.92	0.70	0.53	0.30	0.46	0.42	
36–45	0.54	0.51	0.91	0.71	0.50	0.32	0.41	0.47	
>45	0.51	0.50	0.89	0.71	0.47	0.27	0.32	0.44	
Gender									
Male	0.58	0.50	0.93	0.76	0.61	0.34	0.52	0.48	
Female	0.49	0.52	0.88	0.66	0.34	0.25	0.40	0.50	
Time since arrival									
Less than a year	0.54	0.40	0.90	0.60	0.49	0.14	0.47	0.36	
1–1.5 years	0.53	0.50	0.91	0.71	0.49	0.27	0.47	0.49	
1.5–2 years	0.54	0.50	0.92	0.77	0.49	0.33	0.46	0.48	
2 years or longer	0.55	0.57	0.90	0.74	0.53	0.41	0.48	0.54	
Legal status									
In process	0.69	0.46	0.93	0.66	0.56	0.28	0.51	0.38	
Recognized	0.47	0.54	0.91	0.76	0.47	0.35	0.45	0.55	
Tolerated	0.78	0.49	0.85	0.55	0.60	0.19	0.50	0.32	
Other	0.49	0.46	0.89	0.65	0.48	0.29	0.51	0.47	

**Table 8** (continued)

Region of origin									
Syria	0.48	0.53	0.92	0.75	0.48	0.32	0.46	0.53	
Afghanistan	0.62	0.45	0.92	0.67	0.51	0.32	0.49	0.45	
Iraq	0.55	0.48	0.89	0.72	0.49	0.26	0.47	0.47	
African countries	0.63	0.51	0.94	0.75	0.53	0.34	0.50	0.47	
Other	0.69	0.52	0.88	0.64	0.57	0.32	0.47	0.40	
Survey year									
2016	0.56	0.49	0.91	0.68	0.52	0.31	0.47	0.47	
2017	0.52	0.53	0.91	0.77	0.47	0.29	0.47	0.50	
2018	0.49	0.59	0.88	0.80	0.51	0.44	0.55	0.58	
2019	0.57	0.47	0.89	0.68	0.57	0.39	0.46	0.46	
Recognition of qualifications									
Overall need for service:	2528/7662 = 0.33			Search for housing			Medical care		
Overall utilization of service:	811/2528 = 0.32			6304/7662 = 0.82			6342/7662 = 0.83		
Need (N) and utilization (U) by variables:	N (of 2502)			N (of 6095)			N (of 6134)		
	U (of 789)			U (of 4122)			U (of 5597)		
							N (of 6485)		
							U (of 5896)		
Educational attainment									
No education	0.22	0.19	0.84	0.67	0.85	0.90	0.89	0.91	
Primary education	0.33	0.26	0.83	0.72	0.87	0.92	0.90	0.91	
Secondary education	0.43	0.35	0.83	0.67	0.82	0.92	0.87	0.89	
Tertiary education	0.60	0.45	0.87	0.66	0.83	0.93	0.89	0.92	
Language proficiency									
Low	0.21	0.19	0.83	0.69	0.86	0.91	0.90	0.92	
Medium	0.32	0.25	0.84	0.67	0.84	0.92	0.89	0.91	
High	0.53	0.43	0.83	0.67	0.81	0.91	0.89	0.90	
Work experience in country of origin									
No	0.27	0.35	0.81	0.70	0.85	0.92	0.89	0.92	
Yes	0.38	0.30	0.85	0.67	0.84	0.91	0.89	0.90	

**Table 8** (continued)

SES in country of origin									
Below average	0.31	0.22	0.83	0.67	0.85	0.91	0.91	0.90	0.90
Average	0.34	0.31	0.84	0.68	0.84	0.92	0.88	0.92	0.92
Above average	0.38	0.39	0.85	0.68	0.84	0.91	0.89	0.90	0.90
Family members in GER									
None	0.39	0.34	0.82	0.58	0.84	0.90	0.89	0.89	0.89
1 member	0.33	0.27	0.86	0.71	0.86	0.91	0.90	0.92	0.92
2 members	0.35	0.43	0.77	0.70	0.78	0.92	0.86	0.91	0.91
3 members	0.35	0.38	0.81	0.74	0.78	0.93	0.90	0.93	0.93
Intra-ethnic network size									
No network	0.30	0.33	0.84	0.67	0.84	0.91	0.88	0.90	0.90
Small	0.32	0.26	0.84	0.67	0.84	0.90	0.90	0.90	0.90
Medium	0.34	0.33	0.85	0.68	0.86	0.92	0.89	0.92	0.92
Large	0.39	0.34	0.83	0.67	0.84	0.93	0.89	0.89	0.91
Inter-ethnic network size									
No network	0.25	0.23	0.83	0.62	0.84	0.88	0.89	0.91	0.91
Small	0.32	0.30	0.83	0.66	0.83	0.90	0.88	0.90	0.90
Medium	0.36	0.33	0.84	0.69	0.84	0.92	0.89	0.91	0.91
Large	0.42	0.35	0.85	0.72	0.86	0.94	0.90	0.91	0.91
Age									
17–25	0.37	0.40	0.79	0.63	0.81	0.91	0.87	0.91	0.91
26–35	0.38	0.30	0.86	0.66	0.84	0.92	0.91	0.91	0.91
36–45	0.32	0.27	0.85	0.72	0.87	0.92	0.90	0.91	0.91
>45	0.27	0.23	0.87	0.71	0.87	0.90	0.89	0.91	0.91
Gender									
Male	0.39	0.32	0.84	0.65	0.83	0.91	0.89	0.90	0.90
Female	0.28	0.30	0.84	0.72	0.86	0.92	0.89	0.92	0.92

Time since arrival

*Reading example:* Pertaining to professional support services in the domain of legal advice, 3984 out of 7662 respondents, which is equal to 52%, indicated to need a service. Of those 2094 (53%) were able to utilize a service in said domain. Further differentiating this by variables, 54% of the respondents without any educational degree indicated to require a service in the domain of legal advice; 49% of those indicated to have utilized service in this domain

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**Table 9** Association between 8 domains of service utilization and predictors (full models)

DV: Utilization in the domain of	Legal advice		Learning German	
	Model 1	Model 2	Model 3	Model 4
	AME	(S.E.)	AME	(S.E.)
Educational attainment (ref. no education)				
Primary education	0.052**	0.038	0.045**	0.035*
Secondary education	0.030	0.016	0.049**	0.035*
Tertiary education	-0.001	-0.007	0.097***	0.086***
Language proficiency (ref. low)				
Medium	-0.014	-0.015	0.036**	0.027*
High	0.012	-0.004	0.085***	0.060***
Work exp. in country of origin (ref. no)	0.027	0.025	0.032*	0.030*
SES in country of origin (ref. below average)				
Average	0.031	0.031	0.012	0.013
Above average	0.031	0.024	0.017	0.004
Family members in GER (ref. none)				
1 member		0.044*		-0.021
2 members		0.073*		0.033
3 members		0.063		-0.037
Intra-ethnic network size (ref. no network)				
Small		-0.041		-0.026
Medium		-0.001		0.013
Large		0.040		-0.001
Inter-ethnic network size (ref. no network)				
Small		0.041		0.094***
Medium		0.035		0.140***
Large		0.141***		0.178***

Table 9 (continued)

	Age (ref. >45)	(0.011	(0.027)	-0.010	(0.027)	0.048**	(0.018)	0.018	(0.018)
	17-25	0.036	(0.025)	0.025	(0.025)	-0.009	(0.016)	-0.020	(0.016)
	26-35	0.014	(0.026)	0.002	(0.026)	0.015	(0.017)	0.004	(0.017)
	36-45	0.020	(0.020)	0.030	(0.020)	-0.074***	(0.013)	-0.057***	(0.013)
	Female (ref. male)								
	Time since arrival (ref. less than a year)								
	1-1.5 years	0.085**	(0.026)	0.075**	(0.026)	0.088***	(0.016)	0.083***	(0.016)
	1.5-2 years	0.070*	(0.028)	0.055*	(0.028)	0.113***	(0.018)	0.101***	(0.018)
	2 years or longer	0.162***	(0.026)	0.140***	(0.026)	0.120***	(0.017)	0.107***	(0.017)
	Legal status (ref. recognized)								
	In process	-0.052	(0.020)	-0.058**	(0.020)	-0.062***	(0.014)	-0.074***	(0.014)
	Tolerated	-0.044	(0.032)	-0.054	(0.032)	-0.146***	(0.024)	-0.151***	(0.023)
	Other	-0.050	(0.041)	-0.044	(0.041)	-0.061*	(0.025)	-0.065**	(0.025)
	Region of origin (ref. other)								
	Syria	0.001	(0.026)	0.001	(0.026)	0.058**	(0.018)	0.062***	(0.018)
	Afghanistan	-0.056	(0.030)	-0.066*	(0.030)	0.038	(0.021)	0.043*	(0.021)
	Iraq	-0.012	(0.031)	-0.018	(0.030)	0.080***	(0.021)	0.080***	(0.021)
	African countries	-0.011	(0.035)	0.005	(0.035)	0.095***	(0.025)	0.103***	(0.025)
	Survey year (ref. 2016)								
	2017	0.039*	(0.018)	0.047*	(0.018)	0.068***	(0.012)	0.074***	(0.012)
	2018	0.029	(0.040)	0.019	(0.040)	0.091**	(0.028)	0.093***	(0.028)
	2019	-0.090*	(0.045)	-0.090*	(0.045)	-0.023	(0.030)	-0.020	(0.030)
	N	4418		4418		6989		6989	
	Nagelkerke R <sup>2</sup>	0.032		0.059		0.099		0.135	
	McFadden R <sup>2</sup> (adj.)	0.008		0.021		0.054		0.074	

Table 9 (continued)

DV: Utilization in the domain of		Job search		Education	
		Model 5	Model 6	Model 7	Model 8
		AME	(S.E.)	AME	(S.E.)
Educational attainment (ref. no education)					
Primary education		0.055**	(0.020)	0.031	(0.023)
Secondary education		0.033	(0.024)	0.015	(0.026)
Tertiary education		0.035	(0.025)	-0.040	(0.027)
Language proficiency (ref. low)					
Medium		0.021	(0.020)	0.036	(0.023)
High		0.071**	(0.024)	0.055*	(0.026)
Work exp. in country of origin (ref. no)					
SES in country of origin (ref. below average)					
Average		0.030	(0.020)	0.017	(0.021)
Above average		0.056*	(0.022)	0.036	(0.024)
Family members in GER (ref. none)					
1 member					
2 members					
3 members					
Intra-ethnic network size (ref. no network)					
Small					
Medium					
Large					
Inter-ethnic network size (ref. no network)					
Small					
Medium					
Large					

Table 9 (continued)

	(0.025)	(0.026)	(0.030)	(0.031)
Age (ref. >45)				
17–25	0.122*** (0.025)	0.105*** (0.026)	0.119*** (0.030)	0.082** (0.031)
26–35	0.058* (0.024)	0.051* (0.024)	-0.006 (0.030)	-0.015 (0.029)
36–45	0.066*** (0.025)	0.060* (0.025)	0.034 (0.031)	0.027 (0.031)
Female (ref. male)	-0.042* (0.020)	-0.030 (0.020)	0.024 (0.020)	0.035 (0.020)
Time since arrival (ref. less than a year)				
1–1.5 years	0.171*** (0.029)	0.164*** (0.029)	0.121*** (0.027)	0.116*** (0.027)
1.5–2 years	0.229*** (0.031)	0.211*** (0.030)	0.100*** (0.030)	0.089*** (0.030)
2 years or longer	0.296*** (0.029)	0.271*** (0.029)	0.174*** (0.029)	0.151*** (0.029)
Legal status (ref. recognized)				
In process	-0.043* (0.020)	-0.054** (0.019)	-0.135*** (0.021)	-0.143*** (0.021)
Tolerated	-0.174*** (0.037)	-0.183*** (0.037)	-0.199*** (0.040)	-0.202*** (0.040)
Other	-0.015 (0.039)	-0.013 (0.038)	-0.052 (0.040)	-0.049 (0.039)
Region of origin (ref. other)				
Syria	-0.025 (0.025)	-0.008 (0.025)	0.050 (0.030)	0.059* (0.029)
Afghanistan	0.002 (0.030)	0.013 (0.029)	0.026 (0.034)	0.031 (0.034)
Iraq	-0.037 (0.030)	-0.034 (0.030)	0.049 (0.034)	0.047 (0.034)
African countries	-0.006 (0.034)	0.009 (0.034)	0.018 (0.039)	0.038 (0.039)
Survey year (ref. 2016)				
2017	-0.054*** (0.017)	-0.049*** (0.017)	-0.012 (0.019)	-0.012 (0.019)
2018	0.031 (0.034)	0.043 (0.033)	0.002 (0.038)	0.007 (0.038)
2019	0.010 (0.039)	0.022 (0.039)	-0.106* (0.049)	-0.110 (0.049)
N	4082	4082	3797	3797
Nagelkerke R2	0.110	0.141	0.0810	0.105
McFadden R2 (adj.)	0.055	0.070	0.0343	0.045



Table 9 (continued)

DV: Utilization in the domain of	Recognition of qualifications			Search for housing		
	Model 9	(S.E.)	AME	Model 10	(S.E.)	AME
Educational attainment (ref. no education)						
Primary education	0.029	(0.028)	0.025	(0.028)	0.057***	0.051**
Secondary education	0.081**	(0.028)	0.073**	(0.028)	0.006	0.001
Tertiary education	0.134***	(0.027)	0.129***	(0.027)	-0.001	-0.001
Language proficiency (ref. low)						
Medium	0.016	(0.029)	0.013	(0.029)	-0.037*	-0.039*
High	0.123***	(0.030)	0.112***	(0.030)	-0.024	-0.039*
Work exp. in country of origin (ref. no)	-0.019	(0.023)	-0.018	(0.023)	-0.012	-0.014
SES in country of origin (ref. below average)						
Average	0.064*	(0.027)	0.029	(0.024)	0.005	0.002
Above average	0.030	(0.025)	0.063*	(0.026)	-0.011	-0.018
Family members in GER (ref. none)						
1 member			-0.049*	(0.022)		0.098***
2 members			0.004	(0.031)		0.093***
3 members			-0.009	(0.043)		0.132***
Intra-ethnic network size (ref. no network)						
Small			-0.096***	(0.028)		-0.012
Medium			-0.043	(0.028)		0.004
Large			-0.046	(0.026)		-0.005
Inter-ethnic network size (ref. no network)						
Small			0.052	(0.030)		0.041*
Medium			0.065*	(0.029)		0.084***
Large			0.096***	(0.028)		0.117***

Table 9 (continued)

Age (ref. >45)	0.179*** (0.032)	0.158*** (0.033)	-0.065*** (0.020)	-0.067*** (0.020)	-0.067*** (0.020)
17–25					
26–35	0.088** (0.031)	0.084** (0.030)	-0.044* (0.030)	-0.052** (0.018)	-0.052** (0.018)
36–45	0.054 (0.033)	0.056 (0.033)	0.007 (0.033)	-0.009 (0.020)	-0.009 (0.019)
Female (ref. male)	-0.027 (0.020)	-0.014 (0.020)	0.064*** (0.021)	-0.056*** (0.015)	-0.056*** (0.015)
Time since arrival (ref. less than a year)					
1–1.5 years	0.070* (0.029)	0.071* (0.029)	0.059** (0.029)	0.051** (0.019)	0.051** (0.019)
1.5–2 years	0.068* (0.032)	0.065* (0.032)	0.071*** (0.032)	0.058** (0.020)	0.058** (0.020)
2 years or longer	0.117*** (0.031)	0.114*** (0.031)	0.138*** (0.031)	0.112*** (0.020)	0.112*** (0.020)
Legal status (ref. recognized)					
In process	-0.130*** (0.024)	-0.138*** (0.023)	-0.065*** (0.023)	-0.068*** (0.015)	-0.068*** (0.015)
Tolerated	-0.219*** (0.052)	-0.211*** (0.052)	-0.084*** (0.052)	-0.094*** (0.027)	-0.094*** (0.027)
Other	-0.086 (0.048)	-0.079 (0.048)	-0.034 (0.048)	-0.044 (0.030)	-0.044 (0.030)
Region of origin (ref. other)					
Syria	0.039 (0.030)	0.047 (0.030)	-0.010 (0.030)	-0.010 (0.021)	-0.010 (0.021)
Afghanistan	0.026 (0.038)	0.031 (0.038)	-0.059* (0.038)	-0.058* (0.024)	-0.058* (0.024)
Iraq	-0.019 (0.038)	-0.018 (0.038)	-0.009 (0.038)	-0.015 (0.024)	-0.015 (0.024)
African countries	-0.041 (0.048)	-0.039 (0.048)	-0.031 (0.048)	0.001 (0.028)	0.001 (0.028)
Survey year (ref. 2016)					
2017	-0.020 (0.021)	-0.019 (0.021)	-0.078*** (0.020)	-0.077*** (0.014)	-0.077*** (0.014)
2018	0.009 (0.041)	0.013 (0.041)	-0.048 (0.041)	-0.054 (0.032)	-0.054 (0.031)
2019	0.050 (0.052)	0.046 (0.052)	-0.186*** (0.052)	-0.200*** (0.035)	-0.200*** (0.035)
<i>N</i>	2876	2876	6435	6435	6435
Nagelkerke <i>R</i> <sup>2</sup>	0.171	0.186	0.048	0.071	0.071
McFadden <i>R</i> <sup>2</sup> (adj.)	0.088	0.092	0.021	0.033	0.033

**Table 9** (continued)

DV: Utilization in the domain of	Financial situation					
	Medical care		Model 14		Model 15	
	Model 13	(S.E.)	AME	(S.E.)	AME	(S.E.)
Educational attainment (ref. no education)						
Primary education	0.023*	(0.010)	0.019	(0.010)	0.006	(0.010)
Secondary education	0.017	(0.012)	0.013	(0.012)	-0.011	(0.011)
Tertiary education	0.030*	(0.013)	0.028*	(0.013)	0.027*	(0.013)
Language proficiency (ref. low)						
Medium	0.004	(0.009)	0.003	(0.009)	-0.005	(0.009)
High	-0.018	(0.011)	-0.028*	(0.011)	-0.022	(0.011)
Work exp. in country of origin (ref. no)	-0.008	(0.010)	-0.009	(0.010)	-0.006	(0.010)
SES in country of origin (ref. below average)						
Average	0.005	(0.009)	0.003	(0.009)	0.011	(0.009)
Above average	-0.003	(0.010)	-0.008	(0.010)	-0.011	(0.010)
Family members in GER (ref. none)						
1 member			0.016	(0.009)		(0.009)
2 members			0.027	(0.014)		(0.013)
3 members			0.032	(0.020)		(0.021)
Intra-ethnic network size (ref. no network)						
Small			-0.017	(0.010)	0.001	(0.010)
Medium			-0.005	(0.011)	0.014	(0.011)
Large			0.004	(0.011)	0.009	(0.011)
Inter-ethnic network size (ref. no network)						
Small			0.024*	(0.010)	-0.001	(0.011)
Medium			0.035***	(0.010)	0.003	(0.011)
Large			0.068***	(0.011)	0.015	(0.011)

Table 9 (continued)

Age (ref. >45)									
17–25	0.004	(0.011)	–0.005	(0.012)	0.002	(0.012)	0.003	(0.012)	(0.012)
26–35	0.015	(0.011)	0.010	(0.011)	–0.003	(0.011)	–0.004	(0.011)	(0.011)
36–45	0.013	(0.011)	0.007	(0.011)	–0.003	(0.012)	–0.006	(0.012)	(0.012)
Female (ref. male)	0.011	(0.009)	0.013	(0.009)	0.015	(0.009)	0.013	(0.009)	(0.009)
Time since arrival (ref. less than a year)									
1–1.5 years	0.013	(0.012)	0.009	(0.012)	0.019	(0.011)	0.018	(0.011)	(0.011)
1.5–2 years	–0.015	(0.012)	–0.022	(0.012)	0.004	(0.012)	0.001	(0.012)	(0.012)
2 years or longer	0.006	(0.012)	–0.003	(0.012)	0.027*	(0.012)	0.021	(0.012)	(0.012)
Legal status (ref. recognized)									
In process	–0.014	(0.009)	–0.018	(0.009)	–0.023**	(0.009)	–0.024**	(0.009)	(0.009)
Tolerated	–0.049***	(0.015)	–0.052***	(0.015)	0.000	(0.017)	–0.001	(0.017)	(0.017)
Other	–0.019	(0.017)	–0.021	(0.017)	–0.030	(0.016)	–0.032	(0.016)	(0.016)
Region of origin (ref. other)									
Syria	–0.014	(0.013)	–0.013	(0.013)	0.012	(0.012)	0.010	(0.012)	(0.012)
Afghanistan	–0.032*	(0.014)	–0.032*	(0.014)	–0.008	(0.014)	–0.009	(0.014)	(0.014)
Iraq	–0.021	(0.015)	–0.021	(0.015)	0.008	(0.014)	0.007	(0.014)	(0.014)
African countries	–0.010	(0.017)	–0.002	(0.017)	0.002	(0.016)	0.006	(0.016)	(0.016)
Survey year (ref. 2016)									
2017	0.043***	(0.009)	0.046***	(0.009)	0.038***	(0.009)	0.039***	(0.009)	(0.009)
2018	–0.006	(0.017)	–0.008	(0.017)	–0.021	(0.016)	–0.023	(0.016)	(0.017)
2019	–0.119***	(0.015)	–0.124***	(0.015)	–0.062***	(0.018)	–0.065***	(0.018)	(0.018)
<i>N</i>	6503		6503		6830		6830		
Nagelkerke <i>R</i> <sup>2</sup>	0.051		0.073		0.031		0.036		
McFadden <i>R</i> <sup>2</sup> (adj.)	0.025		0.036		0.010		0.009		

Average marginal effects; standard errors are shown in parentheses. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

**Table 10** Construction and coding of dependent and independent variables

Variable	Coding	Items in questionnaire (SOEP Group, 2020)
<b>Dependent variables – Service needs and utilization</b>		
Sum of all service needs	Scale from 1 to 8 summing up all indicated service needs (answering original item with 1 or 2)	<p><i>If you are new to a country, it is sometimes difficult to manage in different situations. The following questions are about whether, since your arrival in Germany, you have received help from authorities in various areas. Have you received help regarding:</i></p> <ol style="list-style-type: none"> <li>1. Legal advice</li> <li>2. Learning German</li> <li>3. Job search</li> <li>4. Education</li> <li>5. Recognition of degrees</li> <li>6. Housing</li> <li>7. Medical care</li> <li>8. Financial situation</li> </ol> <p><i>Responses:</i></p> <p>1: Yes, I received help 2: No, I needed help but did not receive any 3: No, I did not need any help</p>
Sum of met service needs	Scale from 0 to 8 summing up all met service needs (answering item with 1)	
Sum of unmet service needs	Scale from 0 to 8 summing up all unmet service needs (answering item with 2)	
1. Utilized service on legal advice	8 dummy variables indicating whether help in certain domain was received (Requirement: Indicated need, answering item with 1 or 2)	
2. Utilized service on learning German	0 = No, 1 = Yes	
3. Utilized service on job search		
4. Utilized service on education		
5. Utilized service on recognition of degrees		
6. Utilized service on housing		
7. Utilized service on medical care		
8. Utilized service on financial situation		
<b>Independent variables – Proxies for human capital</b>		
<b>Educational attainment</b>		
	Categorical variable constructed based on the CASMIN classification scheme	<p><i>What is the highest school-leaving qualification that you have?</i></p>
	1 = Less than primary school	
	2 = Primary education	
	3 = Secondary education	
	4 = Tertiary education	
<b>Language proficiency</b>		
	Sum-scale constructed and condensed into 3 categories based on 9 questions (1 “Not at all” to 5 “Very well”)	<p><i>How well can you speak/ read/ write in your native language/ official language/ English?</i></p>
	1 = Low	
	2 = Medium	
	3 = High	

**Table 10** (continued)

Variable	Coding	Items in questionnaire (SOEP Group, 2020)
Previous work experience in country of origin	Dummy variable 0 = No 1 = Yes	What was the last job you had in your country of origin? Response= [open response] or never worked before
SES in country of origin	Categorical variable constructed on self-reported information on economic or income situation relative to others before migration 1 = Below average 2 = Average 3 = Above average	When you think about the time before the crisis or the conflict in your country of origin, how would you rate your economic (income) situation at that time compared to the situation of others in your country? 1= Well above average 2= Above average 3= Average 4= Below average 5= Well below average
Independent variables – Proxies for human capital		
Members of nuclear family in Germany	Categorical variable constructed on summed-up number of family members residing in Germany 1 = None 2 = 1 members 3 = 2 members 4 = 3 members	Questions on 1. Existence of partner 1.1 Residence of partner 2. Existence of mother 2.1 Residence of mother 3. Existence of father 3.1 Residence of father Residence responses: 1. Same accommodation 2. Diff. accommodation, same city 3. Elsewhere in Germany 4. In country of origin 5. Elsewhere abroad

**Table 10** (continued)

Variable	Coding	Items in questionnaire (SOEP Group, 2020)
Size of inter-ethnic network	Categorical variable constructed on summed-up number of new friends and acquaintances 1 = No network 2 = Small (1–3 persons) 3 = Medium (4–6) 4 = Large (7 or more)	<i>How many people from your country of origin have you met since your arrival in Germany with whom you have regular contact?</i>
Size of intra-ethnic network	Categorical variable constructed on summed-up number of new friends and acquaintances 1 = No network 2 = Small (1–3 persons) 3 = Medium (4–6) 4 = Large (7 or more)	<i>How many German people/people from other countries have you met since your arrival in Germany with whom you have regular contact?</i>

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**Data Availability** The data underlying the results presented in the study are third-party data available from the data provider (German Socioeconomic Panel <https://www.diw.de/en/soep>) free of charge for all researchers with an academic affiliation and upon registration with the data provider.

**Code Availability** All statistical codes underlying the results are provided on the author's open science framework profile (<https://osf.io/qjfv4/>).

## Declarations

**Conflict of Interest** The author declares no competing interests.

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