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## **Habilitationsschrift**

### **Mental Health in Refugees and Asylum Seekers – from Evaluating Needs and Psychological Mechanisms to Culturally Sensitive Psychotherapy**

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***“To be called a refugee is the opposite of an insult; it is a badge of strength, courage, and victory.”***

— Tennessee Office for Refugees

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## Abbreviations

CERQ	Cognitive Emotion Regulation Questionnaire
CMHD	Common Mental Health Disorders
CBT	Cognitive Behavioural Therapy
CTQ	Childhood Trauma Questionnaire
ELS	Early Life Stress
EU	European Union
GAD-7	Generalized Anxiety Disorder 7
HTQ	Harvard Trauma Questionnaire
IDP	Internally Displaced People
ISMI-10	Internalized Stigma of Mental Illness Scale
KRI	Kurdistan Region of Iraq
LAMICs	Low- and Middle-Income Countries
MADRS	Montgomery–Åsberg Depression Rating Scale
MCER	Maladaptive Cognitive Emotional Regulation
MENA	Middle East and North Africa
mhGAP	Mental Health Gap Action Program
MSPSS	Multidimensional Scale of Perceived Social Support
NET	Narrative Exposure Therapy
PSS	Perceived Stress Scale
PSQ	Patient Satisfaction Questionnaire
PTSD	Post-Traumatic Stress Disorder
PHQ	Patient Health Questionnaire
RAS	Refugees and Asylum Seekers
RCT	Randomized Controlled Trial
SCCM	Stepped Care and Collaborative Model
TAU	Treatment-As-Usual
UNHCF	United Nations High Commissioner for Refugees
VASyR	Vulnerability Assessment of Syrian Refugees
WHO	World Health Organisation

# **1. Introduction**

## **1.1 The Refugee Crisis**

In the past decade, the world has witnessed what most agree to be the largest global refugee crisis in its history. According to the latest United Nations High Commissioner for Refugees (UNHCR) report, 84 million people are forcibly displaced globally due to persecution, conflict, violence, and serious human rights violations (UNHCR, 2022). Approximately 26,6 million are registered as refugees outside of their country of origin, while 48 million are internally displaced persons (IDPs), and 4.4 million are registered as asylum seekers (UNHCR, 2022). A staggering 30-34 million – i.e., 40 percent – of globally displaced people are children below the age of 18 years (UNHCR, 2022). Refugees and asylum seekers (RAS) primarily originate from low- and middle-income countries (LAMIC) and mostly stay in LAMIC as well, with 85% being hosted in developing countries and 73% having resettled in directly neighboring countries (UNHCR, 2022). Several major global crises continue to contribute to the steady increase of displacement over the past decades. However, the ongoing political and military conflict in Syria, which started initially in 2011 as part of the broader democracy movement known as the “Arab Spring”, has undoubtedly been one of the world’s leading contributors. Until today, more than 13.2 million Syrians have been displaced from their homes, divided into approximately 6.6 million refugees and asylum seekers (RAS) registered in other countries and 6.7 million internally displaced people (UNHCR, 2022). The vast majority of Syrian RAS is hosted by Turkey with more than 3.6 million, followed by Lebanon with roughly 850 000, Jordan with approximately 670 000 and Germany, the only European country in the top five host countries, with around 615 000 (UNHCR, 2021b).

RAS from the Middle East are considered an especially vulnerable population due to the longstanding as well as diverse political and religious conflicts, heterogeneous ethnic and cultural backgrounds, changing political climate in their countries of origin, as well as the ongoing war in Syria with rampant foreign interventions (VASyR, 2021). Consequently, RAS from the Middle East experience a broad range of severe stressors. These can be categorized and summarized into three main dimensions relating to the period of migration: premigration, migration, and post-migration (Bhugra et al., 2011). During the pre-

migration phase, RAS encounter various social and economic hardships coupled with conflict-related stressors such as war, torture, rape, violence, and death of family members and friends (Silove et al., 2017). Already strained by these troubling experiences, individuals are confronted by a stage of active, yet involuntary and unprepared travel in the migration phase.

In most cases, individuals are driven into unknown territory, face uncertainties, and exposure to additional violence, exploitation, or abuse during a risky and stressful flight. While some aim to flee directly to a particular country, a large number of RAS are confronted with temporary detention and protracted situations in refugee camps, having further detrimental effects on their mental health (Essex et al., 2022; Filges et al., 2016; Filges et al., 2015; van de Wiel et al., 2021; von Werthern et al., 2018). Consequently, only a small number of exceptionally resilient refugees make their way to Germany or other host countries, hoping for safety, stability, freedom, and opportunities. Yet, RAS either aiming for temporary or long-term settlement in Germany are most likely confronted with various additional stressors and challenges during this postmigration phase, including financial difficulties, loss of social status, unclear housing situations and residency status, social isolation, loneliness, and discrimination (Bogic et al., 2015; Chen et al., 2017; Porter & Haslam, 2005; Steel et al., 2009; Walther, Fuchs, et al., 2020; Walther, Kroger, et al., 2020). These factors are further coupled with cultural and linguistic barriers, hampering the integration process. Accordingly, a myriad of complex factors accompanies the forced migration process with immense and mutually reinforcing negative impacts on the overall mental health of RAS.

## **1.2 Mental Health in Refugees and Asylum Seekers**

The mental health of refugees and asylum seekers from Arabic-speaking countries has slowly increased interest in recent years, especially in terms of clinical relevance and research outputs (Abbott, 2016). Nevertheless, the assessment and systematic research of mental health in RAS continue to pose diverse and highly complex organizational and methodological challenges for clinicians as well as researchers. These challenges can logically be attributed to the immense difficulty of separating the three different migration phases described before and the limited chance of exploring the interwoven mental health challenges in isolation. The vast majority of literature that emerged throughout the past years focuses on RAS in the

post-migration phase, in which RAS, however, also suffer from experiences made during the premigration and migration phase.

According to recent international meta-analyses and systematic reviews, there is considerable heterogeneity in the prevalence rates of common mental health disorders (CMHD) amongst RAS in European countries (Blackmore, Boyle, et al., 2020; Blackmore, Gray, et al., 2020; Hoell et al., 2021; Kalt et al., 2013; Lindert et al., 2009). Numbers from representative RAS samples vary widely; for example, between 14% to 44% for depression and 23% to 35% for post-traumatic stress disorder (PTSD) (Blackmore, Boyle, et al., 2020; Blackmore, Gray, et al., 2020; Hoell et al., 2021; Lindert et al., 2009). A current review of Syrian RAS in Middle Eastern and European countries indicates wide ranges of prevalence rates, with 20% to 44.1% for depression, 19.3% to 31.8% for anxiety, and an alarming 23.4% to 83.4% for PTSD (Peconga & Høgh Thøgersen, 2020). Another systematic review focusing on the burden on mental health of RAS in Syria and its neighbouring countries suggests even greater heterogeneity and higher overall prevalence of PTSD: 16-84%, anxiety: 49-55%, as well as depression: 11-49% (Hendrickx et al., 2020). Notably, within this review, the authors also discussed individual risk factors amongst RAS, singling out the prior history of mental disorders and traumatic experiences (Hendrickx et al., 2020). Regarding Germany, the largest systematic review and meta-analysis with newly arriving RAS was performed by our research group, indicating pooled prevalence estimates for PTSD symptoms of 29.9% and depressive symptoms of 39.8% (Hoell et al., 2021). Nonetheless, the article included studies that, again, exhibited widely heterogeneous results, which may be attributed to the survey period, length of field period and study quality (Hoell et al., 2021). Different methodological approaches of sampling can further explain the overall considerable heterogeneity in prevalence rates across all studies.

Importantly, research on RAS has also shown that the specific organizational, structural, and cultural conditions, but also the health care system and its capacities in the host countries, can have a decisive influence on the severity of symptoms (Blackmore, Boyle, et al., 2020; Blackmore, Gray, et al., 2020; Bogic et al., 2015; Hoell et al., 2021; Kalt et al., 2013; Lindert et al., 2009; Steel et al., 2009). Consequently, a deeper look into the respective framework conditions of the health care landscape in each country is imperative, especially with regard to the

organization and structure of the mental health system, to allow a better understanding of the human resources and treatment options available.

### **1.3 Mental health care in Jordan, Iraq, and Germany**

In recent years, our research group – Global Mental Health at the Charité – Universitätsmedizin Berlin, Campus Benjamin Franklin – has been conducting multiple humanitarian as well as psychological intervention projects in the Middle East and Europe, specifically in Jordan, Iraq, and Germany. Based on the extensive work, the subsequent sections will discuss the current structure, condition, and challenges of the respective mental health care systems in Jordan, Iraq, and Germany, providing the particular contexts for the *five* research articles of the present habilitation project.

The Kingdom of Jordan, shortly Jordan, is a country with a population of approximately 9.5 million inhabitants located in the Middle East bordering Saudi-Arabia, Syria, Palestine, and Israel. Due to its proximity to conflicting countries and relative political stability, it has a long history of hosting refugees. The largest group of refugees comes from Syria, with more than 1.3 million (Government of Jordan, 2017), followed by 1 million refugees from Palestine, with more than a million (UNRWA, 2020), and 67 000 Iraqi refugees (UNHCR, 2019). Despite its relatively low population of fewer than 10 million inhabitants, Jordan is the second-largest host country for refugees worldwide (WHO, 2020b). Accordingly, Jordan's public health sector is faced with the challenge of providing care for this vast group of refugees with an increased prevalence of mental disorders. Such a major challenge for the demand for mental health care critically intersects with an enormous previously existing human resources gap in the Jordan mental health care system. Based on data from 2020, there are currently only 87 psychiatrists and 13 psychiatric nurses practicing in the whole country, which displays a rate of 0.87 and 0.13 per 100 000 population according to most recent assessments (WHO, 2020b). Furthermore, numbers of psychologists, neurologists, and general mental health workers are lacking, underlining the scarcity of mental health personnel and adequate treatment options (WHO, 2020b). Despite the shortage of personnel, the mental health system is structurally relatively well organized, with five mental hospitals, three general hospital psychiatric units, and one forensic hospital as



inpatient facilities. Furthermore, there are 30 hospitals for mental health, 83 community-based mental health settings, and two facilities specializing in substance abuse for the overall outpatient treatment (WHO, 2020b).

As opposed to the large human resources gaps in the mental health care system, Jordan's overall health care system is compared to its population size strong, counting more than 20 160 physicians, 22 540 nurses and 13 554 pharmacists, thus 202, 226 and 136 per 100 000 population respectively (WHO, 2020b). However, due to prevailing public stigma, especially with visiting a psychiatrist, low income in the mental health sector, and poor mental health literacy in the lay public, among other things, only a small proportion of physicians and nurses are working in mental health care. The WHO recognized this particular need to intensify its support and implemented the mental health gap action program (mhGAP) worldwide for the first time in Jordan (WHO, 2021b). Despite numerous successes of the mhGAP, the number of psychiatric staff remains extremely low, and the mental health treatment needs are high (Sarhan & Alqam, 2013; WHO, 2020a, 2021a). In addition to the shortage in human resources, the public stigma around mental health plays a crucial impending role in help-seeking behavior. Moreover, various factors such as financial shortages, limited absent screening and treatment protocols, or restraining organizational and structural policies contribute decisively to the persistence of major barriers to mental health care for natives and refugees (Al-Soleiti et al., 2021). Altogether, these aspects hamper the help-seeking process, national accessibility, and implementation of evidence-based treatment measures (Hasan & Musleh, 2017).

A country bordering Jordan to the northeast with a similar cultural background is the Republic of Iraq, shortly Iraq. Iraq counts a steadily increasing population of around 40 million inhabitants and is home to diverse ethnic groups, including Arabs, Kurds, Yazidis, and Assyrians. Unlike Jordan, which has been relatively politically stable in the region, Iraq has been characterized by political turmoil, violence, and war over the past four decades (Lafta & Al-Nuaimi, 2019). Periods of conflict led to three million persons fleeing from Iraq to neighbouring countries and Europe, while more than 3.3 million IDPs took refuge in the Kurdistan Region of northern Iraq. The protracted instability and conflict devastated wide parts of the economy and left wide parts of the population in poverty. Currently, there are 6.7 million, thus 18% of the population, with immediate humanitarian needs,

including 3 million children (UNHCR, 2021a). Iraq's health care system has deteriorated significantly since the 1980s. Today, the mental health care system encompasses only two mental hospitals in the country, both located in Baghdad, with staggering 5.4 beds per 100 000 (WHO, 2006b). There is a clear need for human resources in mental health care, with only 0.33 psychiatrists, 0.53 nurses, 0.05 psychologists, and 0.09 social workers per 100 000 population (WHO, 2006b). Still, the country shows progress by increasing bed capacity by 32% within a period of five years (WHO, 2006b). According to most recent and well-conducted available studies, mental disorders were of particular concern in Iraq, being the fourth leading cause of ill health amongst Iraqis older than five years (Al-Jawadi & Abdul-Rhman, 2007; Alhasnawi et al., 2009; WHO, 2006a). As the prevalence of mental disorders is and will likely remain high in the light of persisting instability and conflict, the confined number of mental health specialists can only provide mental health care for a fraction, primarily the most severe cases of psychotic exacerbations, of the populations high need (Sadik et al., 2011). The lacking sufficiency, in turn, fosters a negative image of psychiatry, which significantly impairs the help-seeking process and thus leads to significantly delayed treatment (Hashim et al., 2021; Sadik et al., 2010). Intertwined with already high levels of public stigma, insufficient mental health care training for physicians, this results in large treatment capacity gaps. This further inhibits the development of the nation-wide mental health care capacity and the delivery of necessary psychosocial services on all levels (Kammel, 2008; Younis & Khunda, 2020). In recent years, the Iraqi Ministry of Health, supported by the WHO, declared mental health a core priority and aimed to integrate mental health into primary care to increase access and provision; however, it remains to be confronted with ongoing violence, political instability, lack of financial and human resources as well as poor mental health literacy among the public (Sadik et al., 2011; Sadik et al., 2010).

In contrast to Jordan and Iraq, Germany is a high-income country and is considered a global leader in terms of economic output. Germany is counted among the wealthiest liberal democracies globally as a central partner of the G7 countries. With a population of approximately 83 million people, Germany has the largest population of all countries in the European Union (EU) (WHO, 2022). In response to the large global refugee movements primarily from Arabic countries, Germany opened its borders in 2015 to European nations for refugees, leading to

unprecedentedly high numbers of refugees arriving (Nicolai et al., 2015). Until today, Germany hosted more than 1.47 million RAS and unlike amongst previous immigrant groups, Arabic is the most widely spoken language among refugees in Germany (Bajbouj et al., 2018a). Considering the significantly increased prevalence rates of mental disorders among RAS (Hoell et al., 2021), there is not only a need and legal right for security, housing, and nutrition for the vast refugee population in Germany but also an increasing demand for health care, including mental health care.

Overall, Germany has a relatively well-structured and -funded national health care system with mental care provision delivered on a considerable portion on an inpatient level and more fragmented outpatient institutes coupled with a broad range of psychosocial services (Böge, Karnouk, Hahn, Schneider, et al., 2020; Salize et al., 2007). In total, the mental health system human capacity encompasses 14 354 consultant psychiatrists, 48 265 psychotherapists, 57 269 psychiatric hospital beds in 394 professional institutions and 15 397 day and night hospital treatment places in 417 facilities (Bundesärztekammer, 2021; Gesundheitsberichtserstattung des Bundes, 2020; Statistisches Bundesamt, 2021). Yet, the demand for and costs of the mental health system are considerable. According to the German Association for Psychiatry, Psychotherapy, and Psychosomatics, more than a quarter of Germany's adult population is affected by mental illness each year (Jacobi et al., 2014, 2016). Altogether, direct treatment costs due to psychiatric disorders are estimated to be around 44,4 billion euros per year (Deutsche Psychotherapeuten Vereinigung, 2021). Thus, when increasing numbers of RAS arrived in Germany, despite the comparably robust health care system, glaring challenges emerged in providing mental health care (Bajbouj et al., 2018b). The German health system was neither prepared for the sudden influx nor the need for hundred-thousands of mental health affected persons and despite high human resources, mental health professionals were seldomly trained to cope with multiple cultures and language-specific barriers (Böge, Karnouk, Hahn, Schneider, et al., 2020).

In conclusion, the three host countries - Germany, Iraq, and Jordan all face common as well as different challenges in the wake of the high numbers of refugees with a relatively high prevalence of mental disorders and the subsequently increased mental health demand. Due to Jordan and Iraq's shared cultural

background and territorial proximity, certain denominators related to religious and cultural traits can be deduced regarding the role of mental health stigma. However, both countries' limited human and financial resources have drastic consequences. In contrast, Germany has a well-financed mental-health system, yet, the challenges related to the sudden influx of many refugees coupled with language and cultural barriers put it to a severe test. Thus, despite structural and financial differences between Germany, Iraq, and Jordan, all are insufficiently equipped and display various barriers to fast access, assessment, and provision of effective and resource-saving evidence-based psychological intervention options for Arabic- and Farsi-speaking RAS (Nicolai et al., 2015).

#### **1.4 Psychological Interventions**

Effective psychological treatment of RAS is a complex multilevel endeavor. While in Western countries, biopsychosocial models have prevailed throughout past decades, religious connotations strongly shaped by cultural beliefs about mental health persist in the Arabic-speaking world. This can cause higher degrees of prejudice, bias, and stigma, which ultimately limit access to, acceptance of, and help-seeking behavior regarding mental health care (Hassan et al., 2016; Rayan & Jaradat, 2016). It is not uncommon in Arabic-speaking countries for people with mental illness to be declared insane, punished directly by God, or possessed by a Jinn (Dein & Illaiee, 2018; Islam & Campbell, 2014). Conversely, diminished mental health literacy, among many other things, furthermore, leads to a lack of much needed clinical research creating a shortage of adequate culturally sensitive assessment tools, specific psychological treatment protocols and trained professionals next to limited mental health capacity in general (Karnouk et al., 2021).

In recent years, a growing body of literature on psychosocial interventions for refugees, asylum seekers as well as internally displaced persons has emerged (Uphoff et al., 2020). In general, the current meta-analytic literature, encompassing 12-26 studies with 543 to 1959 participants, demonstrates that psychosocial interventions can be effective in ameliorating depressive-, PTSD-, and anxiety symptoms and that these improvements can persist for follow-up periods of up to six months in adult RAS (Kip et al., 2020; Nose et al., 2017; Turrini et al., 2019; Turrini et al., 2021). Among a large variety of treatments delivered and tested,

specifically Narrative Exposure Therapy (NET) as a part of structured and shortened Cognitive Behavioural Therapy (CBT) focusing on trauma generated solid evidence (Nose et al., 2017). Nevertheless, several authors point to various limitations in existing studies and call for further research to address current shortcomings. Overall, the methodological quality of included studies was limited and there remains considerable heterogeneity regarding the results of the studies. Other shortcomings are the limited number of available trials that include young refugees, the lack of cultural adaptations of applied interventions, relatively small sample sizes as well as considerable heterogeneity of ethnic backgrounds, including participants from Syria, Iraq, Iran, Afghanistan, Ethiopia, Sudan, Balkans, Cambodia, Turkey, Rwanda, Georgia, Bosnia, Lebanon, or Somalia (Kip et al., 2020; Nose et al., 2017; Turrini et al., 2021; Uphoff et al., 2020). These factors highlight the need for further systematic and rigorous research in this developing field.

With its first research questions laid out in the year 2017, the present habilitation project represents a scientific as well as a clinical attempt to fill this research and implementation gap by developing, conducting and evaluating comprehensive studies on mental health in RAS in response to the aforementioned limitations, challenges and barriers. The following goals and outcomes also join the ranks with very recent novel national and international research efforts in the field of psychological interventions, including the PM+ or SH+ programs developed by the WHO as well as Sanadak or Tea Garden to address the treatment gap for RAS (Acarturk et al., 2022; de Graaff et al., 2020; Mewes et al., 2021; Purgato et al., 2021; Rohr et al., 2021).

## **1.5 Objectives and Research Questions**

The current project aims to explore the multi-layered levels of mental health of refugees and asylum seekers in different regional scenarios. In doing so, this project focuses on and seeks to bridge a wide array of mental health factors, including the assessments of mental health care and support services, the exploration of psychological mechanisms and processes, as well as the development, implementation, and evaluation of novel culturally sensitive treatment options for refugees from Arabic and Farsi speaking cultures. The present work comprises five individual publications with diverse research questions conducted in

three different countries, Jordan, Iraq, and Germany, by our research group - Global Mental Health - at Charité – Universitätsmedizin Berlin. All publications were realized within the framework of various third-party projects funded by the Federal Ministry of Health and the Federal Ministry for Economic Cooperation and Development of Germany.

Each publication focuses on a specific portion of mental health factors in refugees and asylum seekers. In joining them together, the present habilitation project provides a deeper insight into the needs and representations of refugees and asylum seekers' mental health. Moreover, it examines the complex challenges and possible solutions to finding and creating effective, culturally sensitive, but also cost-efficient treatment options in the long term.

A summary of the objectives and research questions of the five publications can be found in the following section:

1. Publication: Psychotherapy in the Kurdistan Region of Iraq (KRI): Preferences and Expectations of the Kurdish Host Community, Internally Displaced- and Syrian Refugee Community

- Increase overall knowledge regarding the mental health services in the Kurdistan Region of Iraq
- Examine perspectives, perceptions as well as expectations of Syrian refugees, internally displaced people, and host community members concerning mental health
- Assess beneficiaries' bias, stigma, attitudes and satisfaction with psychosocial services and psychotherapy

2. Publication: On Perceived Stress and Social Support: Depressive, Anxiety and Trauma Related Symptoms in Arabic-Speaking Refugees in Jordan and Germany

- Explore levels and types of perceived stress and social support in Arabic-speaking refugees in Jordan and Germany
- Assess the relationship between perceived stress and social support on depressive-, anxiety-, and PTSD-related symptoms

3. Publication: Exploring the Representation of Depressive Symptoms and the Influence of Stigma in Arabic-Speaking Refugee Outpatients

- Explore the representation of depressive symptoms in Arabic-speaking outpatients
- Measure the prevalence of internalized stigma and examine a possible relationship with psychological and somatic symptoms
- Investigate a hypothesized positive association between internalized stigma and the expression of somatic symptoms

4. Publication: The Role of Emotion Regulation as a Mediator between Early Life Stress and Posttraumatic Stress Disorder, Depression and Anxiety in Syrian Refugees

- Characterise the relationship between cognitive emotion regulation strategies, early life stress as well as PTSD-, anxiety- and depressive-symptoms in Arabic-speaking refugees in Amman
- Investigate the hypothesis that participants with adverse childhood experiences use more maladaptive and fewer adaptive cognitive emotion regulation strategies, which influences present psychopathology
- Assess the hypothesis that participants with higher early adversity will show increased levels of symptoms severity after trauma exposure

5. Publication: Effectiveness and Cost-effectiveness for the Treatment of Depressive Symptoms in Refugees and Asylum Seekers: a Multi-centred Randomized Controlled Trial

- Development of novel psychological and cultural-sensitive digital-, peer-to-peer, and group interventions for Arabic- and Farsi-speaking refugees and asylum seekers within a stepped and collaborative care model
- Conducted a multi-center, randomized controlled trial to evaluate the hypothesis that the proposed model shows greater amelioration in depressive symptoms compared with the routine mental health care system in Germany
- Assess the hypothesis of whether SCCM is more cost-effective compared with the cost-utility of the routine care practices

## 2. Publications

### 2.1 Psychotherapy in the Kurdistan Region of Iraq (KRI): Preferences and Expectations of the Kurdish Host Community, Internally Displaced- and Syrian Refugee Community

The following passage displays a summary of the article published as:

Psychotherapy in the Kurdistan Region of Iraq (KRI): Preferences and Expectations of the Kurdish Host Community, Internally Displaced- and Syrian Refugee Community. **Kerem Böge**, Eric Hahn, Judith Strasser, Stefanie Schweininger, Malek Bajbouj, Carine Karnouk (2021). *International Journal of Social Psychiatry*, 002076402199521. doi:10.1177/0020764021995219

In recent decades, inhabitants of the Kurdish Region of Iraq (KRI) have experienced large amounts of political instability, war and displacement, leading to heightened numbers of psychological distress. Considering the extreme scarcity of mental health resources and the large treatment gaps, we investigated the perspectives, perceptions, and expectations of internally displaced persons, Syrian refugees, and KRI host community members on current mental health care providers in the *first* study of this habilitation project. Overall, we recruited 101 participants from hospitals, clinical settings, and institutions from the governorate of Duhok in the KRI with local partners. Participants stated patient satisfaction, effects of therapy, bias toward treatment, and stigma using the Patient Satisfaction Questionnaire (PSQ). Outcomes showed high overall satisfaction with services and effects of therapy; however, bias and stigma subscales were evaluated ambiguously. The analyses of patient satisfaction and attitudes towards therapy and help-seeking behavior provide important inspiration for psychosocial improvements concerning availability and access to mental health services to close the large treatment gap.

The first study provided insight into expectations, preferences and satisfaction with psychotherapy in Kurdish host- and refugee- communities. Then, in a second study, we looked at the relevant stressors as well as social support structures among refugees in Germany and Jordan, especially in relation to depressive-, anxiety-, and trauma-related symptoms.



# Psychotherapy in the Kurdistan region of Iraq (KRI): Preferences and expectations of the Kurdish host community, internally displaced- and Syrian refugee community

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## Abstract

**Background and Aim:** The Kurdish Region of Iraq (KRI) is home to Kurds, internally displaced persons, and Syrian refugees. In the last decades, its inhabitants have witnessed a great deal of political instability, which has led to increased rates of psychological distress. Mental illness contrasts with limited access to and availability of mental health services – and so the treatment gap remains high. This study aims to investigate the perspectives, perceptions, and expectations of Syrian refugees, internally displaced persons and KRI host community members concerning mental health care in the governorate of Duhok. Attitudes and perspectives regarding psychotherapy, such as satisfaction with services, effects of therapy, bias toward therapy, and stigma, are explored.

**Methods:** One hundred one participants were recruited from hospitals, clinical settings, and institutions from the governorate of Duhok in the KRI. Participants received the Patient Satisfaction Questionnaire (PSQ) and were asked to evaluate services through four subscales: patient satisfaction, effects of therapy, bias toward therapy, and stigma.

**Results:** Results revealed overall high satisfaction with services and effects of therapy. In contrast, both bias and stigma subscales were rated more ambivalently.

**Conclusion:** Patient satisfaction is key for assessing health care quality, understanding attitudes toward therapy, and help-seeking behavior. Results offer insight for stakeholders in the psychosocial field allowing for a better understanding and improvement of availability and access to quality-driven mental health care services

## Keywords

Mental health, psychotherapy, Kurdistan, Iraq, Arab, refugees, asylum seekers, stigma, bias, satisfaction

## Introduction

In recent years, rising numbers have revealed that there are more displaced persons as a result of events following the Arab Spring than those reported after the second World War (Cetorelli et al., 2017; Ibrahim & Hassan, 2017; Okasha et al., 2012). Ongoing conflicts and political unrest in the region have forced millions to seek refuge in neighboring countries (Lebanon, Turkey, Jordan, Iraq, and the semi-autonomous Kurdish region of Iraq) (Ibrahim & Hassan, 2017), and afar. Together, both host and refugee communities must bear the high cost of war – material and non-material (Cetorelli et al., 2017). According to Fasfous et al. (2013), as a result of ongoing conflict, most individuals in Middle Eastern conflict zones have been exposed to at least one traumatic experience in their lifetime. These events have led to a widely documented increase in rates of psychological distress and trauma (Ibrahim & Hassan, 2017) – all of which are well known risk factors for the development of mental illness (Kurdistan Regional Statistics Office

[KRSO], International Organization for Migration [IOM] & the United Nations Population Fund [UNPF], 2018). Although host governments are working closely with local and international organizations to adequately meet the physical and mental health needs of these communities, the treatment gap remains high and sustainable solutions are scarce (Bolton, 2013; Cetorelli et al., 2017).

Iraq is a predominantly Muslim Arab country with over 30 million inhabitants, who have witnessed a considerable amount of war, sectarian violence, and political turmoil in the last decades (Sadik et al., 2010). Its unique geographical

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location, diverse population, and profound contemporary history (2003 Iraq War up to now) lays ground for its complex ongoing political struggles (Sadik et al., 2010). Within Iraq, the Kurdistan Region of Iraq (KRI) has a population size of about five million inhabitants, spread across three main governorates: Sulaymaniyah, Erbil, and Duhok (KRSO, IOM & UNFPA, 2018). According to an official census by the United Nations High Commissioner of Refugees (UNHCR and REACH Initiative, 2015), about 226,934 Syrian refugees had fled to KRI, mostly spread across nine camps in the region (KRSO, IOM & UNFPA, 2018). Among those seeking refuge are also minority groups, such as the Yazidis, who have suffered a great deal of persecution and marginalization from previous regimes and now religious extremists (Cetorelli et al., 2017). According to a study by Ibrahim and Hassan (2017), most refugees in the KRI region reported to have fled for two reasons: (1) a general feeling of safety and stability within the region and (2) a familiar language, nationality, as well as transferable professional skills to the host community (Ibrahim & Hassan, 2017; Salman, 2012).

Historically, wars and conflict-settings have been found to contribute negatively to both mental and physical well-being (Ibrahim & Hassan, 2017). In 2014, an analysis which reviewed nine studies in the Arab region showed a significant effect of war trauma on overall psychological health (Al-ghzawi et al., 2014), with the highest incidence of distress reported by internally displaced people (IDP), who are temporarily located in camps in the KRI region (Cetorelli et al., 2017). Although there are no recent official statistics on the exact prevalence rates of mental illness in the KRI, according to Bolton (2013), the Iraq Mental Health Survey of 2007 revealed an 'increasing lifetime prevalence of most disorders across generations'. So far, the most pronounced disorders in both host and refugee communities, have been PTSD and depression among other disorders (Bolton, 2013; Ibrahim & Hassan, 2017; Naja et al., 2016). Furthermore, mental health treatment in Iraq is scarce, centralized, urbanized and relatively recent, with its first initiatives starting in the late 1970s (Al-Salihy & Rahim, 2013). While some sources report one psychiatrist per 300,000 inhabitants before the year of 2003 (Sadik et al., 2010), others estimate that there are fewer than 1,000 psychiatrists in all of Iraq – most of whom are located in hospital settings, do not offer therapy due to time constraints and rely heavily on prescribing medication (Bolton, 2013).

Although there is currently a rapid transformation in the health system and efforts from international key players and local counterparts alike to offer better psychiatric care, several challenges are still present (Aziz et al., 2014), such as limited training, mental health education, and the absence of formal and official evaluations of the existing psychiatric services in the KRI (Al-Salihy & Rahim, 2013). Additionally, the mental health system in the KRI is heavily dominated by bureaucratic and hierarchical systems (Al-Salihy & Rahim,

2013), making it harder to allocate services where they are actually needed. In a study by Aziz et al. (2014), it was found that Syrian refugees living in the KRI generally had scored high on social relationships, indicating a good level of social support, but had lower scores on domains related to physical and mental health. The paper further urges future research and mental health initiatives to prioritize physical and psychological health for the improved well-being of refugees in the KRI region. Without the support of evidence that can bring light to the current state of affairs regarding the diverse psychological needs of both the host and refugee communities within the KRI, the accurate allocation of funds and resources in the right places will not be possible.

Even though Iraq does not have an official mental health policy, over the years, some ministries, including those of KRI, have acknowledged the treatment gap and are working toward finding solutions (Bolton, 2013). Not only are services scarce and inaccessible, local governments and organizations are also facing cultural and social challenges related to negative attitudes and biases toward mental illness and help-seeking behaviors in the KRI region (Bolton, 2013). Stigma has been known to be one of the leading barriers to seeking treatment in the Arab world (Okasha et al., 2012; Sadik et al., 2010; Westbrook et al., 1993). According to a needs assessment by John Hopkin's School of Public Health, mental health-related stigma in Iraq is higher than in other parts of the world (Bolton, 2013) and Iraqis are often reluctant to seek treatment due to a fear of familial and social marginalization. According to Sadik et al. (2010), in a population-based survey, covering five Baghdadi districts, about attitudes toward mental illness, most respondents saw mental illness as a weakness, were ashamed of it and gave mixed opinions concerning the relationship between psychological distress, work, and marriage. Similarly, another study investigating host and refugee-community members' perspectives on psychotherapy showed overall high rates of satisfaction with provided services, but an ambivalence regards stigma and bias toward therapy (Karnouk et al., 2019). Despite these challenges and barriers, the growing body of research seems to be having an impact on governmental policies, community-based initiatives and increasing access to mental health services (Cetorelli et al., 2017). Not only are investigations of existing-services necessary, but also a key predictor in offering more suitable, effective and culturally-sensitive treatment options.

Within this context, this study contributes to a dearth of available literature and offers a unique glimpse into the perspectives, perceptions, and expectations of Syrian refugees, internally displaced persons (IDPs) and KRI host community members concerning mental health care in the governorate of Duhok. Other public experiences regarding psychotherapy, such as satisfaction with services, effects of therapy, bias toward therapy and stigma, will also be explored.

## Methods

### Participants

A sample of 101 patients was recruited between October and December 2017 in the Kurdish Region of Iraq (KRI). All participants in the current study received psychotherapy- or counseling sessions at various organizations specialized in offering mental health services. Structured interviews assessing sociodemographic information and a self-report measure (PSQ) were administered by local- as well as international interviewers in Arabic, Sorani or Kurmanji; depending on the location of the beneficiaries and their background. The interviews were conducted by psychologists or psychiatrists and were not linked to the service provision. In cases of illiteracy, the interviewers noted the responses for participants and provided clarification on the items when necessary. All interviewers received a thorough and in-depth structured training of 2 days in the form of a workshop in order to guarantee consistency in the interview process.

*Inclusion criteria* were defined as (a) age between 18 and 75 years; (b) belonging either to the Kurdish host-, internally displaced-, or Syrian refugee community; (c) obtained counseling- or psychotherapy sessions within the last 6 months, (d) attended > 4 sessions prior assessment, (e) receiving pharmacological treatment was permitted.

### Procedure

The recruitment of a representative sample was not feasible since younger and female individuals were mostly seeking treatment by our local partners and interested in participation. Therefore, the study design aimed to balance the three patient groups according to their socio-demographic variables, including gender and background (host-, the Syrian refugee community and internally displaced people [IDP]).

In the KRI cooperating local and international organizations recruited suitable candidates by asking for their willingness to participate in the study. Potential participants who met the inclusion criteria received a study information sheet, were encouraged to ask any questions that remained unclear and upon agreement signed an informed consent. The sample was recruited from the following organizations: Azadi Teaching Hospital, Child and Adolescent Mental Health Center Duhok, Emma Organization, Erbil Psychiatric Hospital, International Medical Corps, International Organization for Migration, Jiyan Foundation for Human Rights, Koya University, Mercy Corps, SEED Foundation, Survivor Center Duhok, Terre des Hommes Italy, Wchan, and World Vision International in the Kurdish region of Iraq.

Matching gender between interviewers and participants could not always be ensured in the study due to structural, logistic and personnel challenges. No financial compensation was offered to the participants besides travel costs.

However, all participants received a telephone hotline number allowing for follow-up psychological support if needed. Subsequent to data assessment of the pencil-paper questionnaires, all data was translated by local translators into English. Finally, data were entered into a Statistical Package for Social Science (SPSS) spreadsheet and electronically saved. The ethical committees of Charité – Universitätsmedizin Berlin, Germany accepted the study design in accordance with the latest version of the Declaration of Helsinki.

### Assessment

Culturally sensitive and adequate questionnaires assessing patient perceptions and preferences concerning psychotherapy- and counseling sessions remain scarce in the Arab world. To address this need, an instrument was designed in close collaboration with the NGO Misereor.

The Patient Satisfaction Questionnaire (PSQ) was specifically developed to evaluate patient needs and perceptions concerning relevant psychotherapeutic processes in the MENA region. The instrument has also been successfully used in similar regions, including the Kingdom of Jordan and showed its clinical utility by our research group (see Karnouk et al., 2019). The items are partially based on the well-known PSQ measure by Ware et al. (1983), however, some items were adapted by Misereor and our research team, in order to ensure applicability in the MENA region. These include perceived bias, effects of the therapy, stigma, and patients' satisfaction, containing dimensions, such as beliefs, perceptions, and expectations. The PSQ is a self-report questionnaire originally developed in Arabic containing four subscales covering the main broad domains of mental health care provision. In total, the scale consists of 26 items. Furthermore, it is divided into four subscales with varying item distribution: patient satisfaction (9), bias (6), effects of therapy (7), and stigma (4). Responses for each of the subscales' items are scored on a 5-point Likert scale with diverse anchor points (details stated in Tables 2–5). For the current study, inconsistent to excellent consistency was found for the four subscales with Cronbach's alpha ranging from  $\alpha_{\text{Satisfaction}} = .897$ ,  $\alpha_{\text{Bias}} = .419$ ,  $\alpha_{\text{EffectsofTherapy}} = .880$ ,  $\alpha_{\text{Stigma}} = .705$  (Tavakol & Dennick, 2011).

### Statistical analysis

Prior to the analysis, assumptions of normality (values of skewness and kurtosis), outliers and sphericity were assessed. In the first step, descriptive and inferential statistics for the Patient Satisfaction Questionnaire (PSQ) were calculated. Next, the central tendency of continuous measures was calculated and displayed by frequencies, percentages, means, standard deviations and range of variables. For all categorical variables and subscale items, percentages and

actual counts are presented to illustrate missing measures. To examine the possible difference between three patient groups (host-, the Syrian refugee community, and internally displaced people [IDP]), subsample analyses will be performed using non-parametric Kruskal–Wallis one-way analysis of variance tests. All collected data was collected and stored in a spreadsheet using the Statistical Package for the Social Science (SPSS) 25, MacOS-X. Statistical analyses will be set at an exploratory significance level of  $p < .5$ .

## Results

A total of 104 participants were analyzed in the present study. 61.5% were female, while age ranged from 18 to 74, with a mean of 35.04 (SD=11.64). The majority of participants were Kurdish (86.1%) and indicated Islam as their religion (69.3%). Nearly half of the total sample was from the host community (47.9%), while 22.3% were from Syria (Syrian refugee community), and 29.8% were from the internally displayed community (IDP). All assessed sociodemographic variables are shown in detail in Table 1. Moreover, all descriptive results of frequencies, percentages, means, standard deviations, and range of variables are shown in Tables 2 to 5. Each of the four subscales' mean and test results is depicted in Table 6. Non-parametric Kruskal–Wallis one-way of variance test were conducted demonstrating no significant difference between all four subscales across the three subsamples:  $\chi^2_{\text{Satisfaction}}(2)=0.126$ ,  $p = .939$ ;  $\chi^2_{\text{Bias}}(2)=1.478$ ,  $p=.478$ ;  $\chi^2_{\text{EffectsofTherapy}}(2)=4.663$ ,  $p=.097$ ;  $\chi^2_{\text{Stigma}}(2)=.304$ ,  $p=.859$ .

### Patient satisfaction

In total, results indicate very high satisfaction rates on all eight items of the subscale with a mean of 4.47 (SD=0.79). Sixty-two percent rated the interpersonal level of treatment with 'very good' and 27.9% with 'good'. Therewith, only 2.3 ranked treatment provision with 'poor' and 1% with 'very poor' – 6.7% stated 'fair'. All responses on the satisfaction subscale are displayed on an item and overall level with frequencies, means and standard deviations in Table 2.

### Bias

Bias in the form of attitudes toward the treatment provider was rated on six items. Participants showed moderate levels of bias, with an average response of 2.45 (SD = 1.56). A majority of 58.9% showed reservations regarding gender, religious affiliations, ethnicity and country of origin with their therapist – 53% 'totally disagree' and 5.9% 'somewhat disagree'. Only 34% accepted possible differences with 9.4% 'somewhat agree' and 24.6% 'totally agree', respectively. A minority of 7.1% remained undecided.

**Table 1.** Sociodemographic characteristics of the survey sample.

Sociodemographic data	N= 104
Gender (% , n = 97)	
Male	33.7
Female	61.5
Age in years (% , n = 100)	35.04 (11.64)*
18– 28	34.0
29– 39	34.0
40– 54	25.0
55– 74	7.0
Ethnicity (%)	
Arab	12.9
Kurdish	86.1
Turkmen	1.0
Religion (%)	
Muslim	69.3
Yazidi	30.7
Target group (% , n = 94)	
Host community	47.9
Syrian refugee community	22.3
IDP community	29.8
Waiting time (% , n = 100)	
Same day	69.0
1–7 days	22.0
1– 2 weeks	5.0
3– 4 weeks	1.0
More than 4 weeks	3.0

Note. Waiting time = waiting time between registration with the organization and first contact with a physician or psychologist, IDP = internally displaced people.

\*Mean and standard deviation for age.

Table 3 shows all descriptive statistics on an overall and item level for the bias subscale.

### Effects of therapy

Overall, approval rates for the effects of therapy were very high, with 4.27 (SD = 0.79) on average. About 83.5% were endorsing the treatment effects, split to 52.5% responding with 'totally agree' and 31% with 'somewhat agree'. Less than 7% did not find the treatment effects favorable with 2.2% rating it as 'totally disagree', and 4.7% as 'somewhat disagree'. Roughly, 9.6% of all participants remained undecided. Responses for the subscale effects of therapy and its seven items are presented in Table 4.

### Stigma

For the stigma subscale, all four items are phrased reversed; lower rates of approval display, therefore, lower levels of stigma. For the current sample, the mean score was at 2.37 (SD=1.45), depicting moderate to low levels of stigma. While a majority of 47.0% rejected self-stigmatizing items

**Table 2.** Descriptive statistics of the Patient Satisfaction Questionnaire.

How was the doctor or nurse at. . .	Very poor (%)	Poor (%)	Fair (%)	Good (%)	Very good (%)	Mean (SD)
Making you feel at ease?	0	3.0	11.9	21.8	63.4	4.46 (0.82)
Letting you tell your story?	1.0	1.9	5.8	27.9	63.5	4.51 (0.78)
Really listening? (n = 103)	0	2.9	3.9	28.2	65.0	4.55 (0.71)
Being interested in you as a whole person? (n = 103)	0	2.9	4.9	35.0	57.3	4.47 (0.73)
Fully understanding your concerns? (n = 103)	0	1.9	4.9	26.2	67.0	4.58 (0.68)
Showing care and compassion?	1.9	3.8	7.7	21.2	65.4	4.44 (0.93)
Explaining things clearly? (n = 103)	1.0	1.9	4.9	35.0	57.3	4.46 (0.76)
Helping you to take control?	1.9	1.9	7.7	32.7	55.8	4.38 (0.86)
Overall rating of the consultation / treatment	2.9	1.0	8.7	24.0	63.5	4.44 (0.91)
Overall rating on the Patient Satisfaction Questionnaire	1.0	2.3	6.7	27.9	62.0	4.47 (0.79)

Note. The full sample consisted of  $N = 104$  participants. Very poor = 1, Poor = 2, Fair = 3, Good = 4, Very good = 5.

**Table 3.** Descriptive statistics of the Bias Questionnaire.

It is acceptable if the therapist. . .	Totally disagree (%)	Somewhat disagree (%)	Undecided (%)	Somewhat agree (%)	Totally agree (%)	Mean (SD)
Is a man. (n = 103)	48.5	10.7	7.8	5.8	27.2	2.52 (1.73)
Is a woman. (n = 101)	74.3	4.0	5.0	7.9	8.9	1.73 (1.36)
Has a different opinion regarding national politics. (n = 99)	16.2	2.0	4.0	18.2	59.6	4.03 (1.48)
Is from another country. (n = 101)	63.4	3.0	10.9	10.9	11.9	2.05 (1.51)
Belongs to a different ethnic group. (n = 100)	50.0	10.0	11.0	7.0	22.0	2.41 (1.65)
Belongs to a different religious group. (n = 102)	64.7	5.9	3.9	6.9	18.6	2.09 (1.63)
Overall rating on the Bias Questionnaire	53.0	5.9	7.1	9.4	24.6	2.46 (1.56)

Note. The full sample consisted of  $N = 104$  participants. Totally disagree = 1, Somewhat disagree = 2, Neither agree nor disagree = 3, Somewhat agree = 4, Totally agree = 5.

**Table 4.** Descriptive statistics of the Effects of the Therapy Questionnaire.

	Totally disagree (%)	Somewhat disagree (%)	Undecided (%)	Somewhat agree (%)	Totally agree (%)	Mean (SD)
I mostly feel relieved after the therapy sessions.	1.9	4.8	8.7	23.1	61.5	4.38 (0.97)
The therapy helped me to handle my problems and my distress. (n = 103)	1.9	4.9	7.8	35.9	49.5	4.26 (0.94)
Now I can understand much better, where my problems came from. (n = 101)	4.0	5.9	8.9	22.8	58.4	4.26 (1.10)
With therapy it is easier for me to face the difficulties in my life. (n = 103)	1.9	3.9	11.7	34.0	48.5	4.23 (0.94)
Therapy gave me new hope and new perspectives for my life. (n = 103)	1.0	5.8	10.7	29.1	53.4	4.28 (0.64)
I now get along better with the people in my immediate environment. (n = 102)	2.0	3.9	6.9	38.2	49.0	4.28 (0.91)
Therapy helped me to find solutions for my problems.	2.9	3.8	12.5	33.7	47.1	4.18 (0.99)
Overall rating on the Effects of the Therapy Questionnaire	2.2	4.7	9.6	31.0	52.5	4.27 (0.93)

Note. The full sample consisted of  $N = 104$  participants. Totally disagree = 1, Somewhat disagree = 2, Neither agree nor disagree = 3, Somewhat agree = 4, Totally agree = 5.

**Table 5.** Descriptive statistics of the Stigma Questionnaire.

	Totally disagree (%)	Somewhat disagree (%)	Undecided (%)	Somewhat agree (%)	Totally agree (%)	Mean (SD)
I think if others know about my psychological problems, they lose respect for me.	52.9	13.5	12.5	10.6	10.6	2.12 (1.43)
I am afraid of possible disadvantages in regard to my family planning and family life because of my psychological problems.	23.1	12.5	14.4	26.0	24.0	3.15 (1.51)
I am scared that people are thinking or talking about me in a negative way because I am in therapy for my psychological problems. (n = 103)	47.1	12.5	8.7	19.2	12.5	2.38 (1.53)
I feel ashamed that I have to go to a therapist for my problems. (n = 103)	65.0	10.7	5.8	11.7	6.8	1.84 (1.33)
Overall rating on the Stigma Questionnaire	47.0	12.3	10.4	16.9	13.5	2.37 (1.45)

Note. The full sample consisted of  $N = 104$  participants. Totally disagree = 1, Somewhat disagree = 2, Neither agree nor disagree = 3, Somewhat agree = 4, Totally agree = 5.

**Table 6.** Descriptive statistics and analysis of subsample differences for all subscales (Kruskal–Wallis one-way analysis of variance test).

Outcome variable	Mean rank	$p$
Satisfaction subscale		
Host community (n = 45)	47.17	.939
Syrian refugee community (n = 21)	47.76	
IDP community (n = 29)	49.47	
Bias subscale		
Host community (n = 45)	50.21	.478
Syrian refugee community (n = 21)	41.64	
IDP community (n = 29)	49.17	
Effects of the therapy subscale		
Host community (n = 45)	52.21	.097
Syrian refugee community (n = 21)	51.62	
IDP community (n = 29)	38.84	
Stigma subscale		
Host community (n = 45)	46.57	.859
Syrian refugee community (n = 21)	50.50	
IDP community (n = 29)	48.41	

Note. IDP = internally displaced people.

(‘totally disagree’), answer patterns across all other anchors were distributed equally with 12.3% ‘somewhat disagree’, 10.4% ‘undecided’, and 16.9% ‘somewhat agree’ and 13.5% ‘totally agree’, respectively. Table 5 illustrates all descriptive statistics for the bias subscale with its four items.

## Discussion

Result of the present study indicate higher rates of acceptance concerning psychological services among participants in the KRI region, contrasting with previous research revealing a reluctance to engage in psychiatric treatment from the side of both the patient and their families in Iraq, particularly

for women (Bolton, 2013). The main study findings reveal high levels of satisfaction with psychological interventions, an overall positive evaluation of the effects of therapy, low to moderate levels of perceived public stigma and moderate levels of biases related to therapist characteristics. Several logistical and attitudinal factors may have contributed to these positive changes ranging from an increased need for services to growing public and organizational efforts leading to increased availability, access to and quality of mental health services.

Both subscales ‘patient satisfaction’ and ‘effects of therapy’ were rated positively. Participants reported being relatively satisfied with available services, particularly high scores were given in items such as, feeling heard, understood, with and grasping things more clearly. Moreover, participants also rated the effects of therapy as high, with the most pronounced items being: feeling relieved after sessions, having fresh perspectives and coping better in general. In a similar study in Jordan by Karnouk et al. (2019), respondents who were mostly women and had a similar age group, also rated levels of satisfaction with services as high. Nevertheless, it is worth mentioning that short waiting periods may also have an impact on higher positive ratings and satisfaction with services – a criterion commonly cited as a measure for good quality standards in mental health care settings (Hasler et al., 2004).

In contrast to high levels of satisfaction, stigma and biases were rated more ambivalently. Participant ratings for the stigma subscale ranged between low to moderate. Concerns related to how others would view the individuals if they sought treatment have long been a barrier to seeking psychological care (Pedersen & Paves, 2014). Other studies in the Arab region have reported similar or even higher results (Nasir & Al-Qutob, 2004; Okasha et al., 2012). Furthermore, the study reveals an apparent dissonance between, on the one hand, having an open and positive attitude toward therapy and on the other, having a negative

perceived public stigma related to it. There is a growing need to provide mental health services in the Middle East (Böge et al., 2020; Bolton, 2013). In recent years, efforts for increasing the availability of and access to mental health care services in the KRI region have increased. According to Henderson et al. (2013), increased use of services and treatment-seeking behaviors lead to lower rates of public stigma. As opposed to our study results, existing literature points toward stigma being relatively higher in Iraq when comparing to other places (Bolton, 2013). However, in a study by Petty et al. (2006), participants with changing attitudes evaluated matters more neutrally than their initial attitude. In this study, participants reported having no shameful feelings associated with therapy and did not worry that others would lose respect for them. However, one dominant consensus was with regard to fears related to family planning. The family unit is known to be a powerful pillar in Arab culture, especially for women, who make up most of our sample. In another study by Sadik et al. (2010), most participants saw mental illness as a ‘weakness’ and had concerns regarding the effect of their psychological distress on marriage prospects (Awad et al., 2013; Heath et al., 2016).

Furthermore, the ‘bias’ subscale was rated ambivalently with some contradictory items standing out, particularly with regards to specific characteristics related to the therapist, such as gender and political opinion (Karnouk et al., 2019). Whereas more than half of the sample did not find it acceptable if the therapist ‘is a man’, 74% did not find it acceptable for the therapist to be ‘a woman’ either. Given that most of the respondents in this study are females, these findings demonstrate an interesting contradiction. In the literature, gender biases have been reported to be particularly strong in predominantly Muslim countries, with previous research reporting clear preferences and openness to therapists who are women, particularly for female clients for reasons related to cultural norms and gender roles (Heath et al., 2016). Moreover, this paradox may also be a feature of attitude change and openness (Petty et al., 2006). Nonetheless, it is still unclear whether these results may be due to vague wording/phrasing in the questionnaire. It makes it therefore challenging to understand whether these attitudes stem from cultural norms and gender roles, or whether they truly reflect the respondents preferences in matching genders. For future use, it would be beneficial for this item to be reviewed and for the overall Patient Satisfaction Questionnaire to be refined and validated in order to improve its accuracy and usefulness in the region, where assessments are often scarce.

Furthermore, respondents mentioned having no biases with regards to a difference in national politics between therapist and client. However, the therapist being of the same nationality, ethnic and/or religious group was clearly preferred. Factors such as trust, perceived stigma and a fear of the therapist not connecting to the client’s reality may be playing a role here, especially that our sample

includes several minorities, such as Kurds and Yazidis. The sample characteristics are culturally diverse, capturing the real-life setting and demonstrating the ‘ecological validity’ of our study.

Several strengths and limitations were identified in this exploratory study. Although the sample was recruited through different hospitals and organizations within governorate of Duhok, the sample was not randomized, and it is most likely that only participants who showed interest and a willingness to take part in the study were recruited. Therefore, it may be possible that because this was a convenience sample, patients with lower satisfaction may not have taken part in the study, contributing to inflated levels of satisfaction with therapy and mostly positive reports with regards to its effects. Although the analysis revealed no subsample differences between the different community members, it would be interesting to conduct a replication or confirmatory study with larger sample size. Moreover, the KRI is a diverse region, with differences in socio-political structures, religious orientations, ethnicity and more. Due to a scarcity in time and availability of resources, the collections of valuable information and ‘qualitative’ experiences of respondents were not possible at this point. Furthermore, relevant information with regards to the length of overall treatment, type of therapy, and/or diagnoses would have been interesting to analyze. It would also be useful to build on these findings

In conclusion, the study provides evidence for the growing acceptance of mental health services and positive changes toward accessing and receiving psychotherapy in the KRI. Understanding patient satisfaction and the effects of therapy are essential indicators for improving access to and the quality of mental health services. These investigations allow for more practical plans and an accurate allocation of resources. In turn, positive experiences will cause a decrease in stigma and biases. While the treatment gap remains high in KRI, governmental- and other developmental efforts are collaboratively tackling mental health-related issues and aiming to improve mental health care services, therefore investigating client preferences and expectations and examining their quality can also improve existing infrastructures and create a system whereby both therapist and client can benefit from treatment conditions. Within that context, follow-up studies capturing the effects of these efforts on decreasing rates of psychological distress would be valuable sources of information that are useful for refugees, host community members, IDP’s and service providers alike.

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## 2.2 On Perceived Stress and Social Support: Depressive, Anxiety and Trauma Related Symptoms in Arabic-Speaking Refugees in Jordan and Germany

The following passage displays a summary of the article published as:

On perceived stress and social support: Depressive, anxiety and trauma-related symptoms in Arabic-speaking refugees in Jordan and Germany. **Kerem Böge**, Carine Karnouk, Eric Hahn, Zaynab Demir, Malek Bajbouj, (2020). *Frontiers in Public Health*. 239(8). doi:10.3389/fpubh.2020.00239

Refugees and asylum seekers are faced with different adversities depending on the host country they resettle in. The *second* study examines the relationship between perceived social stress and social support on post-traumatic-, anxiety-, and depressive symptoms in Syrian refugees in two host countries - Germany and Jordan. A total of 89 Syrian refugees (Berlin, Germany = 49 and or Amman, Jordan = 40) were recruited and assessed with the Patient Health Questionnaire-9 (PHQ-9), Generalized Anxiety Disorder-7 (GAD-7), Harvard Trauma Questionnaire (HTQ), Multidimensional Scale of Perceived Social Support (MSPSS), and Perceived Stress Scale (PSS). Generally, participants showed relevant psychopathology on all dimensions, high perceived stress and moderate to high social support. We found significant differences in post-traumatic symptoms between refugees in the two countries, with higher rates displayed in Jordan. Participants in Germany stated that perceived social support had a positive influence on post-traumatic- as well as depressive symptoms, while significant others improved depressive symptoms. In contrast, participants in Jordan named family support as having the most crucial positive effect on post-traumatic symptoms. Even though levels of perceived stress seem to be stable across host countries, the specific type of social support appears to have a vital effect on particular symptom dimensions.

After exploring the importance of the respective social support systems in each country and showing a high burden of these mental health symptoms in both countries in the second study, we aimed to examine specifically the representation of depressive symptoms as well as the possible influence of stigma on these in refugees in Germany.



# On Perceived Stress and Social Support: Depressive, Anxiety and Trauma-Related Symptoms in Arabic-Speaking Refugees in Jordan and Germany

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Current literature points toward several challenges in the access to sufficient and effective psychosocial care for Syrian refugees in host settings. This study is a comparative investigation into the relationship between “perceived social stress” and “perceived social support” on three of the most prevalent symptom dimensions in Syrian refugees across two host capitals, Berlin and Amman. Eighty nine Syrians refugees were recruited between January 2017 and March 2018. Participants were contacted through local institutions and organizations collaborating with the Charité—Universitätsmedizin Berlin. Assessments include the PHQ-9, GAD-7, HTQ, MSPSS, and PSS. Primary analyses consist of non- or parametric tests and multiple linear regression analyses. Subsample analyses showed relevant depressive, anxiety and trauma-related symptoms. Significant differences in PTSD symptoms ( $p < 0.04$ ) were found. Participants reported high perceived stress and moderate to high social support. Linear regressions revealed that perceived stress had a significant negative effect ( $p < 0.01$ ) on clinical outcomes in both subsamples. Perceived social support had a positive influence on depressive ( $p = 0.02$ ) and PTSD symptoms ( $p = 0.04$ ) for participants in Berlin. Analyses revealed significant positive effects of “significant others” ( $p = 0.05$ ) on depressive- in Berlin and “family” ( $p = 0.03$ ) support for PTSD symptoms in Amman. Study results show that levels of “perceived stress” appear to be the same across different host countries, whereas types of social support and their effect on mental health differ significantly depending on the host setting. Outcomes may guide future comparative study designs and investigations to promote well-being, integration, and the development of effective social support structures for the diverse needs of Arabic-speaking refugees.

**Keywords:** mental health, perceived stress, social support, depression, anxiety, trauma, refugees

## INTRODUCTION

The Syrian conflict, which is now approaching its eighth consecutive year, has forced more than 5.6 million of the country's citizens to take refuge in many corners of the world (1, 2). Countries in the Middle East and Europe were among the first to respond to the urgent plea for humanitarian aid and assistance. Of these nations, Germany and the Kingdom of Jordan have hosted a high number of Syrian refugees and asylum seekers (3). At first, Syrian citizens sought refuge in neighboring countries, but in response to the crisis, by the summer of 2015, Germany's open-door policy allowed Syrian citizens to request asylum and make Europe their new home (4).

Various barriers, which include cultural, linguistic, financial, as well as risks of discrimination, exploitation, and social isolation, have led to an inability to satisfy the basic needs of the Syrian refugee population (5). In turn, this has had a direct effect on mental health, prospects of integration and overall well-being (6). Recent studies have confirmed that the three most common psychiatric disorders observed in Syrian refugees are PTSD, depression and anxiety (1). Prevalence rates range between 20.5 and 35.7% for PTSD, 20 to 43.9% for depression (7, 8), and from 19.3 to 31.8% for anxiety disorders (9). Furthermore, loss and grief have been reported to be central themes (10). Other factors, such as the length of stay, living environment, uncertain residence status, acculturation processes, also seem to play a crucial role in the development of psychological distress (1).

In host environments, familiar sociocultural habits and routines are often disrupted (10). It has been reported that Syrian families often become estranged, report a loss of identity and a longing for home (5). According to Cohen and Syme (11), social support from family, friends and significant others (12) have been identified as protective factors "that aid in the maintenance of health as well as in disease recovery." In Syrian host communities, basic community support groups, recreational spaces and development programs are scarce. Similarly, little attention is given to psychological and cognitive injuries, their consequences, and services to assist long-term recovery, despite available evidence psychosocial support as a coping resource and catalyst for positive change and well-being (13–15).

Combined, the Kingdom of Jordan and Germany have hosted more than 1 million Syrian refugees (3, 16). According to reports from 2019, there are a total of 664,330 registered Syrian refugees in Jordan (16) and there are about 646,665 asylum applicants in Germany since 2015 (17). Although both host countries are accommodating a large number of Syrian refugees, it seems like many sociodemographic variables influence refugee choices of a final destination (18). This choice is often informed by age, gender, education, marital status, national politics, and other factors. Although choices are often limited, some Syrian refugees choose to migrate to a neighboring country for reasons of "cultural proximity," such a familiar language, similar religious values, national views and most importantly transferable skills (18). Some refugee communities also choose host countries, where they already have existing social ties and familial support networks. For young women, cultural norms and gender roles can play a role an important role in this choice (19), whereas

this may be a different case for young men (20)—leading to diverse migration trends within one community. Furthermore, response to Syrian crisis, many organization and development programs have established mental health and psychosocial support activities, particularly in their capitals—Amman and Berlin (21).

Jordan is a relatively small, middle-income country with a climate that is influenced by ongoing political conflict, high poverty rates, and treatment gaps (22–24). Therefore, priority is given to the physical and basic needs of refugees (2, 25). In Jordan, the official national language is Arabic. Cultural customs and social fabrics are familiar to those of most Syrian refugees. According to a recent report (2), Jordan is currently considered the country with the highest number of NGOs operating in the MENA (Middle East and North Africa) region.

In contrast, Germany is a high-income country with developed structures (legal, medical, and educational), open recreational spaces and financial wealth. Nonetheless, Germany still seems to be facing ongoing challenges that are different from those of Jordan. These challenges are mostly related to linguistic, cultural and social barriers surrounding the integration and psychosocial support of refugee populations (5). In 2013, Charité Universitätsmedizin, Berlin was spearheading many initiatives in Jordan with its ChariteHelp4Syria project (CH4S) (5), yet despite increased knowledge and integrating best practice models, a treatment gap still remains.

Therefore, the present study aims to understand the relationship between "perceived stress" and "perceived social support" on the three most prevalent symptom dimensions (depressive-, PTSD-, and anxiety-related symptoms) observed in refugee populations residing in the capitals of two of the world's largest host countries for Syrian refugees—Amman and Berlin.

## METHODS

### Participants and Procedure

Eighty nine Syrian refugees who resettled in either Berlin, Germany ( $n = 49$ ) or Amman, Jordan ( $n = 40$ ) were recruited between January 2017 and March 2018. In total, 89 participants were invited to take part in the study, all gave informed consent and none dropped out throughout the study process. In Berlin, participants were recruited at the central clearing clinic, an outpatient institution by Charité—Universitätsmedizin Berlin, specialized in offering psychiatric services for refugees and collaborates with multiple refugee camps and civic initiatives. In Amman, participants were recruited via the ChariteHelp4Syria project, a joint project of Charité and the German humanitarian non-governmental Organization "Help—Hilfe zur Selbsthilfe."

For the study inclusion criteria were defined as (a) 18–65 years of age, (b) literate in Arabic language, and (c) having been exposed to the Syrian Civil War from 2011 onwards. Exclusion criteria included (a) lifetime diagnosis of psychotic disorder, bipolar disorder, personality disorder, (b) intellectual disability, (c) any mental disorder due to a general medical condition, and (d) current substance abuse.

An information sheet about study procedures was handed out by physicians. Participants were informed about the anonymity

of data and their right to withdraw from the study at any time without giving a reason or the withdrawal having an impact on the services received by any governmental or non-governmental organizations. Ethics approval (EA4/067/10) was granted by the ethics review board of Charité—Universitätsmedizin Berlin according to the Declaration of Helsinki. All participants were provided with written informed consent and were financially reimbursed for their participation.

## Questionnaires

The self-rated Patient Health Questionnaire-9 (PHQ-9) (26) a validated Arabic instrument (27–29) which is used to assess the presence and severity of depressive symptoms. It includes a score range from 0 to 27. Responses for each of the nine items range from “0” (“not at all”) to “3” (“nearly every day”) with higher scores corresponding to higher symptom severity. In the present study, the PHQ-9 total score displayed good internal consistency (Cronbach's  $\alpha = 0.85$ ).

The Generalized Anxiety Disorder-7 (GAD-7) (30) is a self-reported screening instrument aiming to detect generalized anxiety symptoms and measure anxiety symptoms. It consists of seven items, which are scored on a four-point Likert-scale, ranging from “0” (“not at all”) to “3” (“nearly every day”). The validated Arabic version of the GAD-7 has been shown to have good psychometric validity (27, 29). In the current study,  $\alpha$  was 0.86, indicating good internal consistency.

The Harvard Trauma Questionnaire (HTQ) (31) is a self-rated questionnaire assessing multiple facets of trauma experiences. The first part comprises of 42 items illustrating traumatic events, such as lack of food and clean water, torture, rape, and murder of family member or friend which are rated on a dichotomous scale: yes (1) and no (0). The second part consists of an open-ended question, in which participants can describe the most hurtful and terrifying. The third part encompasses 16 items, which aim to assess posttraumatic stress disorder symptoms (PTSD) severity. Responses are rated on a five-point Likert scale. Cut-off scores for current PTSD is set at  $>2.5$ . For the current study, the Arabic version of the HTQ was used, which has already been validated with refugees from Iraq and shown sufficient validity and a good test-retest reliability in previous studies (32, 33). Furthermore, part one and three showed good internal consistency with 0.89 and 0.87, respectively.

The self-report Multidimensional Scale of Perceived Social Support (12) is a brief questionnaire designed to measure perceptions of support from three main sources: (1) family, (2) friends, and (3) a significant other. The MSPSS comprises in total 12 items, subdivided into four items per subscale. Responses are given on a seven-point Likert scale. High scores resemble stronger perceived support. The MSPSS was administered in Arabic language and its validation has shown good internal and test-retest reliability, good validity, and a fairly stable factorial structure (34). For the current study,  $\alpha$  was 0.88, indicating good internal consistency.

The Perceived Stress Scale (PSS) (35) is a self-rated questionnaire developed to assess the degree to which situations in one's life are appraised as stressful. The PSS consists of ten items, is two-dimensional and includes positively and negatively

phrased items. Participants give their responses on a five-point Likert scale. The Arabic version (36) of the administered PSS has good psychometric properties and displayed acceptable internal consistency ( $\alpha$ ) with 0.77 in the current study.

## Statistical Analysis

All data was collected, stored, and analyzed by using the Statistical Package for the Social Sciences (IBM, SPSS, Version 23), MacOS-X. Sociodemographic variables were descriptively represented using frequencies, percentages, means and standard deviations. Subsample analyses were performed to assess possible differences in clinical outcomes between both communities using non- or parametric tests, either one-tailed independent *t*-test or Mann-Whitney-U-Test. In a next step, regression analyses including non-standardized regression coefficient (B) and standardized regression coefficient ( $\beta$ ) were calculated using perceived social support and perceived stress as the independent variable and the clinical outcomes such as depressive-, anxiety-, and post-traumatic stress symptoms as the dependent variable. The level of significance was set at  $p < 0.05$ .

## RESULTS

Demographic characteristics of the sample and both cohorts, Amman and Berlin, are summarized in **Table 1**. For the whole sample, participants were mainly female (53.9%), on average 33.9 years old, Syrian (96.6%), married (58.4%), not graduated from high school (39.3%), flew with their family (67.4%), escaped Syria for 42.71 months, and spent 39.15 months in German or Jordan, respectively. Furthermore, there are substantial differences between both cohorts as a majority in Berlin were male (59.2%) while in Amman female (70%). In Berlin, the age ranged between 18 and 40 years (93.8%) with an average of 30.00 (7.99) years while in Amman participants' age were rather balanced across years with an average of 38.9 (10.6). Furthermore, most participants who arrived in Berlin were single (53.1%) and flew alone (45.0 %) and were educated (81.6%) which stands in contrast to primarily married (82.5%) participants in Amman who escaped with their family (95%) and had not graduated from high school (65 %). Lastly, the departure from Syria was on average 29.2 (16.1) months ago for participants from Berlin and 59.3 (12.3) for Amman while time spent in the new country was 23.0 (11.6) and 58.9 (12.8) months indicating considerable difference between both cohorts, respectively.

## Clinical Outcomes and Differences Between Both Communities

Concerning each subsample, results for participants from Berlin indicate relevant depressive—(8.31) and anxiety symptoms (7.89), which are at the threshold of mild to moderate symptom severity. With a cut-off score for current PTSD set at  $>2.5$ , participants illustrate post-traumatic stress symptoms bordering the diagnostic threshold (2.11). Furthermore, on average 15.98 of 43 items of the HTQ “after war” subscale was marked exhibiting relevant traumatic experiences. Participants from Berlin displayed high perceived stress (28.20) and were

**TABLE 1** | Sociodemographic characteristics of the survey sample and each subsample.

Socio-demographic variables	Survey sample (n = 89)	Refugees living in Berlin (n = 49)	Refugees living in Amman (n = 40)
<b>Gender [%]</b>			
Male	46.1	59.2	30.0
Female	53.9	40.8	70.0
<b>Age (range) [%]</b>			
18–30	41.6	57.1	22.5
31–40	36.0	36.7	35.0
41–50	12.4	0	27.5
51–60	10.1	6.1	15.0
<b>Nationality [%]</b>			
Syria	96.6	93.9	100.0
Iraq	1.1	2.0	0
Saudi Arabia	1.1	2.0	0
Palestine	1.1	2.0	0
<b>Marital status [%]</b>			
Single	36.9	53.1	15.0
Married	58.4	38.8	82.5
Divorced	5.6	8.2	2.5
<b>Educational status [%]</b>			
Not graduated high school	39.3	18.4	65.0
High school degree	28.1	34.7	20.0
Bachelor's degree	13.5	24.5	0
Master's degree	19.1	22.4	15.0
<b>Course of flight [%]</b>			
Alone	27.0	45.0	5.0
Family	67.4	44.8	95.0
Friends	5.6	10.2	0
<b>Months since departure from Syria [%]</b>			
0–24	30.3	53.1	2.5
25–48	24.8	34.7	12.5
49–72	39.3	12.2	72.5
73–96	5.6	0	12.5
<b>Months spent in Germany/Amman [%]</b>			
0–24	37.1	63.3	5.0
25–48	23.6	34.7	10.0
49–72	33.7	2.0	72.5
73–96	5.6	0	12.5

considered to have moderate, at the border to high, social support (4.69).

For participants from Amman, results demonstrated similar results with relevant depressive—(9.55) and anxiety symptoms (9.60), which are also at the cut-off threshold from mild to moderate symptom severity. Like the Berlin cohort, participants revealed post-traumatic stress symptoms at the diagnostic boarder (2.31) with 18.23 on average for the HTQ “after war” subscale. Perceived stress was high (26.91) and perceived social support at the border from moderate to high (5.09).

Statistical comparisons regarding clinical outcomes between subsamples demonstrated significant differences

**TABLE 2** | Mean, standard deviation and *p*-values of clinical outcomes according to each subsample.

Outcome Variable	Mean (SD)	<i>p</i>
<b>PHQ-9<sup>1</sup></b>		
Berlin (n = 49)	8.31 (4.64)	0.13 <sup>b</sup>
Amman (n = 40)	9.55 (5.64)	
<b>PHQ-7<sup>2</sup></b>		
Berlin (n = 49)	7.98 (4.74)	0.10 <sup>a</sup>
Amman (n = 40)	9.60 (5.38)	
<b>HTQ after war<sup>3</sup></b>		
Berlin (n = 49)	15.98 (6.99)	0.08 <sup>b</sup>
Amman (n = 40)	18.23 (7.63)	
<b>HTQ PTSD<sup>4</sup></b>		
Berlin (n = 49)	2.11 (0.59)	<b>0.04<sup>b</sup></b>
Amman (n = 40)	2.31 (0.44)	
<b>PSS<sup>5</sup></b>		
Berlin (n = 49)	28.20 (7.32)	0.21 <sup>b</sup>
Amman (n = 40)	26.91 (7.23)	
<b>MSPSS<sup>6</sup></b>		
Berlin (n = 49)	4.69 (1.34)	0.21 <sup>b</sup>
Amman (n = 40)	5.09 (1.25)	

<sup>1</sup> = Cronbach's  $\alpha = 0.85$ ; <sup>2</sup> = Cronbach's  $\alpha = 0.86$ ; <sup>3</sup> = Cronbach's  $\alpha = 0.89$ ; <sup>4</sup> = Cronbach's  $\alpha = 0.87$ ; <sup>5</sup> = Cronbach's  $\alpha = 0.77$ ; <sup>6</sup> = Cronbach's  $\alpha = 0.88$ ; <sup>a</sup> = Mann-Whitney-U Test; <sup>b</sup> = independent samples t-test;  $\alpha = 0.05$  (one-tailed). Significant *p*-values < 0.05 are marked in bold.

in post-traumatic stress symptoms ( $p < 0.04$ ). **Table 2** summarized all clinical outcomes including mean, standard deviation and *p*-values according to each subsample.

## Regression Analysis

To analyse the impact of perceived social support and perceived stress on symptoms of depression, anxiety and post-traumatic stress, multiple linear regression analyses were performed. Overall, regression analyses revealed that perceived stress had a significant negative effect ( $p < 0.01$ ) on all three clinical outcomes in Berlin as well as Amman. However, regression analyses concerning the influence of perceived social support on depressive, anxiety, and post-traumatic stress symptoms showed significant positive effects for two clinical outcomes in Berlin but not in Amman. Here, results indicate that perceived social support had a positive influence on depressive- ( $\beta = -0.065$ ;  $p = 0.02$ ) and post-traumatic stress symptoms ( $\beta = -0.009$ ;  $p = 0.04$ ) for participants in Berlin. On a subscale level, analyses displayed a significant positive effect of “significant other” ( $\beta = -0.118$ ;  $p = 0.05$ ) on depressive- in Berlin and “family” ( $\beta = -0.029$ ;  $p = 0.03$ ) on post-traumatic stress symptoms in Amman. A summary of the primary regression analyses, including on-standardized regression coefficient (*B*) and standardized regression coefficient ( $\beta$ ) and *p*-values (*p*) for each subsample, are depicted in **Table 3**.

**TABLE 3** | Regression analysis for perceived stress and social support on depression, anxiety, and post-traumatic stress symptoms in Berlin and Amman with beta scores, standardized beta values, and their significance values.

Questionnaire	Berlin			Amman		
	b	$\beta$	p	b	$\beta$	p
<b>PHQ-9</b>						
MSPSS	-0.065	-0.240	<b>0.02</b>	-0.018	-0.048	0.36
PSS	0.325	0.595	<b>&lt;0.01</b>	0.571	0.696	<b>&lt;0.01</b>
<b>PHQ-7</b>						
MSPSS	-0.042	-0.143	0.10	-0.063	-0.178	0.12
PSS	0.414	0.642	<b>&lt;0.01</b>	0.428	0.547	<b>&lt;0.01</b>
<b>PTSD</b>						
MSPSS	-0.009	-0.230	<b>0.04</b>	-0.001	-0.030	0.43
PSS	0.033	0.412	<b>&lt;0.01</b>	0.034	0.535	<b>&lt;0.01</b>

Significant p-values < 0.05 are marked in bold.

## DISCUSSION

The present study aimed to explore “perceived stress” and “perceived social support” on three of the most prevalent symptom dimensions including depressive-, PTSD- and anxiety symptoms in Syrian refugees (1) in both host capitals, Berlin and Amman. Similar to other studies (1), the main findings of this study revealed that perceived stress has a significant negative effect on all three clinical outcomes in both cohorts. Moreover, perceived social support showed positive effects for *only* depressive—and PTSD symptoms in the Berlin sample, but not for Amman. There were no associations observed between perceived social support and anxiety symptoms in both samples. When analyzing the subscales of “perceived social support”, only two types of social support had a positive influence on the participants’ mental health. In the Berlin cohort, “perceived social support” from a “significant other” had a positive effect on depressive symptoms, whereas, in the Amman sample, support from a “family member” had a positive effect on trauma-related symptoms.

According to global trends in forced displacements, most refugee communities remain close to their homeland, while only a small number of individuals move to more distant and remote host countries. While most arrivals in Jordan were documented between 2012 and 2015 (37), Germany’s open door policy gave access to asylum seekers mostly in the summer of 2015 (4). This timeline thus reflects a realistic representation of why participants reported having stayed for longer periods in Amman. Official data from census also confirm that over two-thirds (about 69.2%) of asylum seeking applicants in Germany are also males (20) reflecting the significantly higher prevalence of educated, single males in the Berlin sample.

Germany offers newly arriving refugees integration- and language courses, as well as professional development opportunities (38). In contrast, the Kingdom of Jordan offers proximity to home, a similar language, cultural norms and more easily transferable skills. Young adult males may be fulfilling their familial duties of “scouting the route” for other “more

vulnerable” family members that are yet to follow (possibly through reunification programs). However, for young Syrian refugee women, a close tie to gender and cultural norms, especially with regards to marital prospects and proximity to family may take precedence over professional or economic goals (5, 19) The motivations to favor some host countries over others may have led to the heterogeneity of sociodemographic variables within our samples, making a sound methodological comparison practically impossible. In contrast, one of the major strengths of this study is its ecological validity, in which real-life circumstances and similarities are clearly noticeable in our cohorts. It is, thus, important to interpret the study’s data cautiously without making claims of inferences or causality. Nonetheless, results from such studies may help policy makers in the development and implementation of more formal and visible social support structures. Findings may also influence new treatment models that are more suitable for this population’s needs and offer compelling evidence in support of new scalable peer-to-peer intervention efforts, such as the STRENGTHS project (39), and other hybrid stepped-care models, such as MEHIRA (Mental Health of Refugees and Asylum Seekers (40).

A significant strength of this study is that the results give first insights into the types of social support that have shown to have a significant positive effect on Syrian refugee mental health. So far, the relationship between mental health and social support has been under-investigated in this vulnerable population, although there has been evidence proving the general benefits of social support on mental and physical well-being (11, 41, 42). In the Berlin cohort, it seems like support offered by a “significant other” had a positive influence on depressive symptoms, whereas “family” support seemed to alleviate trauma-related symptoms in the Amman sample. The Syrian culture is known for its rich cultural customs and traditions, as well as strong familial relationships and social fabrics (5). Therefore, family separation undoubtedly leads to increased feelings of emotional distress (5, 43). Because most of the Berlin sample is made up of single males, it may be possible that, as a coping mechanism, this cohort relies on social support from “significant other” as a substitute for the absent family. In contrast, within the Amman sample, which is made up of mostly Syrian women, relying on the family unit may reflect traditional gender roles. Investigating further aspects were not within the scope of the present paper, but it is imperative that future studies also focus “within-group” differences in experiences and perceptions of stress and social support needs of refugee communities.

Regarding the limitations of the study, all variables were assessed with subjective, self-report questionnaires, however reports of past experiences may be prone to reporting bias (44). Moreover, no psychiatric standardized interview was conducted to assess diagnostic criteria. Therefore, clinical outcomes only display symptom dimensions. Furthermore, the research is cross-sectional limiting any conclusions regarding causality and generalizability. Due to limited resources, the role of some factors such as resilience, education, socioeconomic background, were beyond the scope of this paper. Such analyses may be useful to follow up on in future research to make meaningful associations.

In conclusion, the present study gives the first comparative insights into the relationship between “perceived social stress” and “perceived social support” on three most prevalent symptom dimensions in Syrian refugees in both Germany and Jordan’s capitals—Berlin and Amman. Overall, results show that “perceived stress” levels are the same across different host countries; however, types of social support and their effect on symptoms differ significantly depending on the host setting.

## DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Charité - Universitätsmedizin Berlin, Ethics Committee. The patients/participants provided their written informed consent to participate in this study.

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## AUTHOR CONTRIBUTIONS

KB, CK, EH, ZD, and MB contributed to the study conception and research design. ZD and MB led all aspects concerning data recruitment and assessment. KB, CK, EH, and MB contributed to the drafting of the manuscript. KB conducted the data analysis while ZD prepared the data sheets. All authors commented and contributed to the final manuscript and have seen and given final approval of the version to be published.

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**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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### 2.3 Exploring the Representation of Depressive Symptoms and the Influence of Stigma in Arabic-Speaking Refugee Outpatients

The following passage displays a summary of the article published as:

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Multiple barriers and challenges have been identified, impeding refugees and asylum seekers access to and provision of adequate psychological health care. Next to legal and structural hurdles, representations and stigma towards mental health are particularly important. In the *third* study, we investigated the representation of somatic and psychological depressive symptoms as well as the influence of internalized stigma amongst Arabic-speaking refugees and asylum seekers. A sample of 100 Arabic-speaking refugee outpatients was recruited at Charité – Universitätsmedizin Berlin. Participants' somatic and psychological symptoms were measured with the Patient Health Questionnaire (PHQ) 15 and 9. At the same time, internalized stigma was assessed with the Brief Version of the Internalized Stigma of Mental Illness Scale (ISMI-10). Participants displayed moderate somatic and psychological symptom severity, with sleeping problems and energy loss mentioned most prominently. Overall, stigma was low in the sample and showed no association with somatic symptoms; however, stigma was associated with higher levels of psychological symptoms. Moreover, principal factor extraction highlighted five independent somatic symptom clusters. In line with current research, the sample displays moderate levels of somatic and psychological symptoms. Our outcomes show no direct influence of stigma on the representation of somatic-, however, on psychological symptoms, while first evidence is given for an association between symptom expression and explanatory models as well as conceptualizations of depression in the Arabic language.

In the fourth study, we then looked for the first time at the mediating role of emotion regulation as a vital psychological mechanisms in the context of a cross-sectional study of refugees residing in Germany as well as Jordan



# Exploring the Representation of Depressive Symptoms and the Influence of Stigma in Arabic-Speaking Refugee Outpatients

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The number of distressed refugees from the Arab world is relatively high in Germany and other host countries worldwide. For this specific population, substantial challenges and barriers have already been identified that hamper access to Germany's health care system. This study aims to contribute to this line of research by exploring the representation of depressive symptoms, both somatic and psychological, in order to inform clinicians about the most prevalent symptoms reported by Arabic-speaking refugee outpatients. Furthermore, this paper investigates the longstanding claim that mental health stigma fosters the expression of bodily distress. For these purposes, a total of 100 Arabic-speaking refugee outpatients, mostly Syrians, were recruited in Berlin, Germany. Somatic and psychological symptoms were assessed with the Patient Health Questionnaire (PHQ) 15 and 9, while stigma was assessed with the Brief Version of the Internalized Stigma of Mental Illness Scale (ISMI-10). Study results show that both somatic and psychological symptom severity was moderate while sleeping problems and energy loss were the most reported symptoms across both scales. Stigma was low and showed no association with somatic complaints in a multiple regression analysis, but was associated with more psychological symptoms. A principal factor extraction on the PHQ-15 items revealed five independent, somatic symptom clusters that were interpreted considering the rich poetic resources of the Arabic language. In conclusion, both somatic and psychological symptoms were commonly reported by Arabic-speaking refugees with symptoms of depression. Whereas, stigma does not seem to influence the expression of somatic symptoms, the present results provide first empirical indications for the relationship of symptom expression with the use of explanatory models and conceptualizations of mental illness within the Arabic culture and language. Future research efforts should be dedicated to enhancing our understanding of mental health care needs in this population as well as to exploring other mediators that might help explain the varying degree of somatic symptoms in depression across cultures.

**Keywords:** refugee, Arabic, depression, somatic, stigma

## INTRODUCTION

In recent years, the number of individuals who have been forcibly displaced as a consequence of persecution, conflict, and violence around the world has risen to nearly 70 million. This number accounts for the highest total ever recorded by the United Nations High Commissioner for Refugees (1). As a result, more than 1.6 million asylum requests have been registered by the German Federal Office for Migration and Refugees (BAMF) since 2015, making Germany one of the most important host countries for refugees in the world (2, 3). In 2018, most refugees arrived from Syria (27.1%), followed by Iraq (10.0%), Nigeria (6.4%), Iran (6.3%), Turkey (6.3%), and Afghanistan (6.3%) (3). According to a representative survey of over 2,000 refugees in Germany, the main causes of flight include violent conflicts, war, prosecution, and impressment (4). Since Arabic-speaking countries currently constitute the largest number of displaced people, Arabic is considered by far the most frequently spoken native language within the refugee population in Germany (4, 5).

Exposure to traumatic events before and during migration, coupled with stressful experiences in the host environment, have been found to cause increased rates of psychological distress among refugee populations (6–9). Nonetheless, reliable epidemiological studies investigating the prevalence and course of mental illness in Germany's refugee population remain scarce (6, 10). Available tentative data, from rather small refugee samples, indicate that prevalence rates for any psychiatric disorder range between 30.5 and 95% (11–15). A recent meta-analysis estimates that the prevalence for depression in non-help-seeking Arabic-speaking refugees in Germany is 38% (95%-CI: 27–50%) and 29% (95%-CI: 21–37%) for symptoms of a post-traumatic stress disorder (PTSD) (Hoell, under review).

In light of the high need for psychiatric and psychotherapeutic treatment in this population, it is striking that refugees rarely have access to adequate and effective treatment services (16). As a contributing factor, multiple barriers seem to exist that hamper access to the German health care system for refugees and asylum seekers (10, 17). These comprise of institutional and structural barriers, such as restrictions through the Asylum-Seeker's Benefits Act and the lack of multilingual clinicians, as well as individual barriers, including lack of knowledge and language skills, shame, social, and cultural barriers (10, 17, 18). Moreover, it might be necessary to investigate whether and how experiences of trauma, war, and forced migration, coupled with a shared cultural background, translate into specific symptom representations and dysfunctions that contribute to misdiagnosis and delays in efficient and effective treatment in this population (19, 20).

Research on cultural differences in psychopathology has long focused on somatization in non-Western cultures, which can be defined as a process by which psychological distress is expressed in somatic terms (21). However, this line of research has often been driven by Western, rather stereotypical perspectives on culture, coupled with a tendency to equate culture with an ethnocultural group or merely using country of origin as a proxy (21, 22). Thus, calls for research practices that take on a more nuanced view and thereby identify the influences of

specific cultural contexts and processes on psychopathology have recently raised (21). Such more sophisticated approaches have contributed to a more profound understanding of somatic symptoms in depression in cross-cultural research: In general, somatic symptoms can be considered a universal phenomenon in depressed individuals across cultures (23). Moreover, an epidemiological study with Chinese individuals in Hong Kong has shown that somatic and depressive symptoms seem to be positively correlated, which contradicts the notion that somatic symptoms are merely an immature expression of emotional distress (24). Still, an abundance of literature has found differences in the phenomenology of somatic symptoms in depression across cultural groups (19). As one potential mediator, Ma-Kellams has identified differences in somatic awareness and interoceptive accuracy across cultures and was able to link these to variations in the expression of somatic symptoms in psychopathology (25). Similarly, Ryder and colleagues showed that the relationship between culture and the presence of somatic symptoms was mediated by a tendency toward eternally oriented thinking (26). In conclusion, Kirmayer and Ryder argue that differences in the bodily expression of distress across cultures may be linked to culturally mediated modes of symptom interpretation which may be the result of stigma and available sources of help (21).

The notion that stigma might foster somatic symptom expression has often been suggested in the literature as an explanation for the observed cross-cultural variations [e.g., (21, 27)]. In general terms, mental health stigma can be understood as the negative stereotyping, biases, and discrimination faced by people with mental illness which negatively impacts the lives of affected persons in various ways (28). However, empirical evidence to support these claims is scarce and rather contradictory. Whereas, Wang et al. (29) and Rao et al. (30) found a significant association between stigma and somatization in a sample of Chinese undergraduate students and South Indian psychiatric inpatients, neither Heredia Montesinos et al. (31) nor Raguram et al. (32) found such an association in Turkish migrants or South Indian psychiatric outpatients, respectively.

In the literature on Arab mental health, various sources have suspected a causal relationship between mental health stigma and somatic symptoms (33–35). For instance, Al-Krenawi and Graham (34) attribute somatic symptom expression to a higher social acceptability of physical over psychological complaints in Arab cultures. In general, mental health stigma has been found to be highly prevalent in both Arab cultures and refugee populations (36–38). For instance, Dardas et al. (39) report that 88% of a representative sample of Jordanian adolescents have moderate to high stigma concerning depression. This in turn influences the help-seeking behavior for mental health issues, as individuals from Arab cultures fear bringing shame not only to themselves, but also to their families (40). Similarly, refugee adolescents from different countries have been shown to label mental health problems with a type of "craziness" that has to be hidden, because it negatively influences family reputation, social status and marriage prospects (41). As such, the population of Arabic-speaking refugees seems to be well-suited for the investigation of the relationship

between stigma and the expression of somatic symptoms in depressed individuals.

Thus, the aim of the present study is to explore the representation of depressive symptoms in Arabic-speaking refugee outpatients. Furthermore, the prevalence of internalized mental health stigma will be assessed in order to investigate its relationship to the expression of psychological and somatic symptoms. Since various sources suspect that the bodily expression of distress is high in Arab cultures, *because of* prevalent mental health stigma (33–35), we test the hypothesis that internalized mental health stigma, which is the psychological impact of applying these negative societal stereotypes to oneself (42), is positively associated with the expression of somatic symptoms.

## METHODS

### Participants

For the current cross-sectional study, a convenience sample of 100 Arabic-speaking refugees was recruited via the MEHIRA (Mental Health in Refugees and Asylum Seeker) study (43) between October 2018 and October 2019 in Berlin, Germany. Five individuals were excluded due to missing questionnaires, resulting in a total sample size of  $N = 95$ . An a priori power analysis indicated that a total sample size of  $N = 68$  is required for the detection of a moderate effect ( $f^2 = 0.15$ ), with two predictors and a power of 80%, given an alpha error of 5%. Recruitment sites included the *Clearingstelle*, an outpatient facility for refugees in Berlin, and a psychiatric outpatient facility specialized in Arabic-speaking patients in Berlin, both established by the Charité Universitätsmedizin Berlin, Germany.

Inclusion criteria were defined as the following: (1) individuals between 18 and 65 years; (2) native Arabic speakers; (3) status of a refugee or asylum seeker which is defined according to the UNHCR as individuals who have been forced to flee their home country due to war, violence, or persecution (refugee) or as individuals who have requested sanctuary in another country and have applied for recognized refugee status there after fleeing their country (asylum seeker); who (4) show relevant symptoms of depression, defined by scoring “several days” or higher on the PHQ-9 on at least five of the nine items.

The exclusion criteria were: (1) missing informed consent; and a (2) current risk of suicidality based on clinical judgement or a score of four or more on the Montgomery-Åsberg Depression Rating Scale (MADRS) item 10.

### Procedure

Study participants were invited to take part in a baseline assessment, lasting ~90 min. Questionnaires of this comprehensive test-battery included, amongst others, the Arabic versions of the PHQ-15, the PHQ-9, the HTQ, and the ISMI, as well as socio-demographic information. All questionnaires were self-administered, yet an Arabic speaking psychologist surveilled the procedure and assisted in cases of illiteracy or need for further support. The data was then pseudonymized and transferred to a spreadsheet using the Statistical Package for the Social Sciences (SPSS) 22 for Windows (44). Since the

study was conducted as a supplement to the MEHIRA study, it was covered and approved by the respective ethics vote issued from the ethics committee of the Charité – Universitätsmedizin Berlin (EA2/070/17).

## Questionnaires

### Patient Health Questionnaire-15 (PHQ-15)

The PHQ-15 (45) is a brief and widely used self-administered screening instrument for the expression of somatic symptoms. Its 15 items cover over 90% of the physical symptoms seen in primary care, such as stomach/back pain and/or headaches, excluding upper respiratory tract symptoms. Participants indicate on a three-point Likert scale, how much they had been bothered by the respective symptom in the past 4 weeks, ranging from “not bothered at all” (0) to “bothered a lot” (2). Symptom severity can be classified according to a sum score, ranging from 0 to 30, while scores of  $\geq 5$ ,  $\geq 10$ ,  $\geq 15$  represent mild, moderate, and severe levels, respectively. The PHQ-15 has been proven to be highly reliable and valid in both clinical and occupational settings (45–48). Furthermore, it has been previously applied to screen for somatic symptoms across cultures and in refugee populations (49, 50). According to a review of 40 scales for the assessment of self-reported somatic symptoms, the PHQ-15 can be considered the best option for large-scale studies and cross-cultural comparisons based on several criteria including psychometric criteria, type of symptoms, time frame, languages, and patient burden (51). An Arabic translation of the PHQ-15 has been demonstrated to be both valid and highly reliable in a sample of Saudi University students, with a Cronbach's  $\alpha$  of 0.83 (52). For the current study, Cronbach's  $\alpha$  was 0.82.

### Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 (53) is a self-administered diagnostic screening instrument for the assessment and monitoring of depression severity in primary care. The nine items of the scale assess each of the Diagnostic Criterion A symptoms for a Major Depressive Episode according to the DSM-IV (54). Participants indicate the degree to which they had been bothered by the respective symptom in the past 2 weeks on a four-point Likert scale, ranging from “not at all” (0) to “nearly every day” (3). The PHQ-9 sum-score can be divided into the following five categories of increasing symptom severity: minimal (2–9), mild (10–14), moderate (15–19), and severe ( $\geq 20$ ). Furthermore, a cutoff-score of  $\geq 10$  has been recommended for the detection of a current Major Depression Episode (55). Numerous studies have demonstrated the validity and reliability of the PHQ-9 in specific medical populations, in the general population and psychiatric samples (46, 56–58). Furthermore, cross-cultural measurement invariance has been demonstrated for both the PHQ-9 and the PHQ-15 in two studies comparing Germans and migrants, indicating their applicability for cross-cultural research (59, 60). Two studies have been conducted to assess the reliability and validity of an Arabic translation of the PHQ-9 in Saudi University students (52) and a Lebanese outpatient sample (61). Evidence for factorial, discriminant, and convergent validity was provided, and the reliability of the scale was found to be high ( $0.86 \leq \alpha \leq 0.88$ ) (52, 61). In the present sample, Cronbach's  $\alpha$  was 0.79.

### The Brief Version of the Internalized Stigma of Mental Illness Scale (ISMI-10)

The ISMI-10 (62) is a brief, ten-item questionnaire for the assessment of internalized stigma of mental illness. In its original form, the ISMI comprises of 29 statements, measuring the five dimensions *alienation, discrimination experience, social withdrawal, stereotype endorsement, and stigma resistance* (63). The shortened version entails the two items of each subscale that demonstrated the strongest psychometric item qualities. Participants are asked to indicate their degree of agreement to a particular statement on a four-point Likert scale, ranging from “strongly disagree” (1) to “strongly agree” (4). The ISMI mean score can be interpreted following a 4-category method [minimal to no internalized stigma (1.00–2.00); mild (2.01–2.50); moderate (2.51–3.00); severe internalized stigma (3.01–4.00)] (64), or according to a 2-category method [does not report high internalized stigma (1.00–2.50); reports high internalized stigma (2.51–4.00)] (65). Comparable psychometric properties have been found for the ISMI-10 and the 29-item version, in terms of validity and reliability (62). In further validation studies, the scale was found to be reliable ( $0.75 \leq \alpha \leq 0.86$ ) and demonstrated predictive validity in relation to depression, physical health, self-esteem, functioning, recovery orientation, perceived devaluation and discrimination, empowerment, and quality of life (62, 66–68). To date, only the ISMI-29 has been translated into Arabic and validated within a refugee population (69). The Arabic version was shown to predict symptoms of depression, anxiety, and PTSD, and the reliability was found to be excellent ( $\alpha = 0.94$ ). For the present study, the 10 items of the ISMI-10 were selected out of the Arabic translation of the ISMI-29. Cronbach's  $\alpha$  of this version was 0.70 in the current sample.

### The Harvard Trauma Questionnaire (HTQ)

The HTQ (70) is the most widely used screening instrument for the assessment of trauma-related symptoms among refugee populations worldwide (71, 72). Part four covers 40 items related to PTSD and refugee-specific expressions of functional distress (73). The first 16 items of this last part are derived from the DSM-IV criteria for PTSD and are used for the purposes of the present study. Participants are asked to indicate on a four-point Likert scale how much they had been bothered by a respective symptom, ranging from “not at all” (1) to “extremely” (4). Individuals can be considered symptomatic for PTSD according to the DSM-IV if their mean score reaches the cut-off of  $\geq 2.5$ . Across a wide range of populations, this measure has been found to be reliable, and convergent validity has been demonstrated (74). An Arabic translation of the 16 item measure of the HTQ by Shoeb et al. (75) was found to be highly reliable in a sample of Syrian Kurdish refugees, with a Cronbach's  $\alpha$  of 0.88 (76). Furthermore, the number of instances of torture and other traumatic events experienced were positively related to PTSD symptoms, underlining the HTQ's concurrent validity (76). In the present study, Cronbach's  $\alpha$  was 0.89.

### Statistical Analyses

All data was pseudonymized and stored in a password protected electronic spreadsheet. Statistical analyses were performed using

**TABLE 1** | Sociodemographic characteristics of the survey sample.

Sociodemographic data	N = 95
<b>Gender</b>	
Male	54 (56.8%)
Female	41 (43.2%)
<b>Age in years</b> M $\pm$ SD 33.80 $\pm$ 9.69*	
19–30	44 (46.3%)
31–40	29 (30.5%)
41–50	15 (15.8%)
51–64	7 (7.4%)
<b>Country of Origin</b>	
Syria	75 (78.9%)
Iraq	12 (12.6%)
Palestine	4 (4.2%)
Kuwait	1 (1.1%)
Jordan	1 (1.1%)
Lebanon	1 (1.1%)
Libya	1 (1.1%)
<b>Current state of residence</b>	
Permanent residence permit	2 (2.1%)
Temporary residence permit	84 (88.4%)
No legal residence permit	9 (9.5%)
<b>Education in years</b> M $\pm$ SD 10.46 $\pm$ 2.99*	
0–5	6 (6.3%)
6–10	28 (39.5%)
11–15	57 (60.0%)
>15	4 (4.2%)

\*Mean and Standard Deviation.

the IBM Statistical Package for the Social Sciences (SPSS) 22 for Windows (44). Descriptive statistics were used to analyze the sample's socio-demographic characteristics (Table 1), as well as to provide an overview over the agreement to each individual item of the PHQ-15 and the PHQ-9 (Tables 2, 3). Multiple regression analyses were conducted with the PHQ-15 score and PHQ-9 score as dependent variables, and the ISMI and the HTQ as predictors to test for associations of stigma with somatic and psychological symptoms, while controlling for trauma (Table 4). Finally, an explanatory factor analysis was performed on the PHQ-15 items using varimax rotation to identify culture-specific symptom clusters (Table 5). The alpha level of significance was set at 5%.

## RESULTS

For the present study, the data of 95 participants, 54 males and 41 females, with a mean age of 33.80 years ( $SD = 9.69$ ; range 19–64), were analyzed. With over 78%, the majority of the refugees in the sample named Syria as their country of origin, followed by Iraq (12.6%) and Palestine (4.2%). Only a small percentage of 2.1% received a permanent residence status

**TABLE 2** | Mean and standard deviation for each item of the PHQ-15 and the total scale.

PHQ-15	M (SD)
<b>Total score (0–30)</b>	<b>13.24 (5.58)</b>
<b>Single items values</b>	
1. Stomach pain	0.69 (0.76)
2. <b>Back pain</b>	<b>1.26(0.75)</b>
3. Pain in your arms, legs, or joints	1.25 (0.76)
4. Menstrual cramps or other problems with your period (women only, N = 38)	1.03 (0.79)
5. Pain or problems during sexual intercourse	0.29 (0.54)
6. Headaches	1.25 (0.73)
7. Chest pain	0.85 (0.71)
8. Dizziness	0.79 (0.74)
9. Fainting spells	0.14 (0.37)
10. Feeling your heart pound or race	1.02 (0.68)
11. Shortness of breath	0.97 (0.78)
12. Constipation, loose bowels, or diarrhea	0.74 (0.75)
13. Nausea, gas, or indigestion	0.65 (0.74)
14. <b>Feeling tired or having low energy</b>	<b>1.53 (0.70)</b>
15. <b>Trouble sleeping</b>	<b>1.44 (0.74)</b>

N = 95, the three items with the highest agreement are printed bold.

**TABLE 3** | Mean and standard deviation for each item of the PHQ-9 and the total scale.

PHQ-9	M (SD)
<b>Total score (0–27)</b>	<b>16.28 (5.67)</b>
<b>Single items values</b>	
1. Little interest or pleasure in doing things	2.05 (0.92)
2. <b>Feeling down, depressed, or hopeless</b>	<b>2.18 (0.84)</b>
3. <b>Trouble falling or staying asleep, or sleeping too much</b>	<b>2.21 (1.01)</b>
4. <b>Feeling tired or having little energy</b>	<b>2.25 (0.89)</b>
5. Poor appetite or overeating	1.77 (1.17)
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	1.65 (1.11)
7. Trouble concentrating on things, such as reading the newspaper or watching television	1.99 (1.05)
8. Moving or speaking so slowly that other people could have noticed? Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual	1.26 (1.18)
9. Thoughts that you would be better off dead or of hurting yourself in some way	0.92 (1.09)

N = 95, the three items with the highest agreement are printed bold.

from local authorities, whereas most individuals had a temporary residence status (88.4%), or even no legal residence permit (9.5%) to stay in Germany. On average, participants completed 10.46 years of schooling ( $SD = 2.99$ ). Detailed information concerning all sociodemographic characteristics assessed is provided in **Table 1**. As such, the sociodemographic characteristics in terms

**TABLE 4** | Multiple regression analyses for the prediction of somatic and psychological symptoms by internalized stigma and the trauma.

Variable	PHQ-15 <sup>a</sup>			PHQ-9 <sup>b</sup>		
	B	SE	$\beta$	B	SE	$\beta$
ISMI	1.00	1.02	0.09	2.75	0.89	0.25*
HTQ	4.66	0.85	0.51**	5.08	0.72	0.57**
R <sup>2</sup>	0.29			0.47		
F	18.00**			38.93**		

<sup>a</sup>N = 91, <sup>b</sup>N = 92; \*\* $p \leq 0.001$ , \* $p \leq 0.01$ .

of age and gender seem to be highly comparable to representative panel data of refugees living in Germany (77). In terms of education, a comparison is rather difficult due to the different types of assessment (years of education vs. international standard of education). Yet, the samples also seem comparable in this respect.

## Symptom Representation

Descriptive analyses were performed for both the PHQ-15 and the PHQ-9 to explore the expression of depressive symptoms in the present sample. The results are depicted in **Table 2** for the PHQ-15 and **Table 3** for the PHQ-9. For the PHQ-15, the calculated mean score of 13.24 ( $SD = 5.58$ ) indicates a moderate level of somatic symptoms. A detailed analysis on the item level revealed that the Arabic-speaking refugees in the sample were mostly bothered by *feeling tired or having low energy* ( $M = 1.53$ ;  $SD = 0.70$ ), followed by *trouble sleeping* ( $M = 1.44$ ;  $SD = 0.74$ ), and *back pain* ( $M = 1.26$ ;  $SD = 0.75$ ). For the PHQ-9, the mean score of 16.28 ( $SD = 5.67$ ) is also indicative of a moderate level of psychological symptoms. Here, the symptoms that were experienced most frequently by the participants were *feeling tired or having little energy* ( $M = 2.25$ ;  $SD = 0.89$ ), followed by *trouble falling or staying asleep, or sleeping too much* ( $M = 2.21$ ;  $SD = 1.01$ ), and *feeling down, depressed, or hopeless* ( $M = 2.18$ ;  $SD = 0.84$ ). A correlation analysis revealed a moderately significant positive association between psychological and somatic symptoms ( $r = 0.54$ ,  $p < 0.001$ ).

## Influence of Stigma on Symptom Representation

For the following analyses, three participants had to be excluded because they did not provide any answer to the ISMI scale. On average, participants displayed a rather low level of internalized stigma ( $M = 2.25$ ;  $SD = 0.50$ ), corresponding to *mild internalized stigma* according to the 4-category method, or to the category of *does not report high internalized stigma* according to the 2-category method (see above). The mean score of 2.58 ( $SD = 0.61$ ) in the HTQ shows that, on average, individuals of the sample show relevant symptoms of PTSD according to the DSM-IV.

These two variables were entered as predictors into multiple regression analyses with the PHQ-15 and the PHQ-9 as dependent variables to test for associations of stigma with somatic and psychological symptoms while controlling for the

**TABLE 5** | Explanatory factor analysis of the PHQ-15 items in Arabic-speaking refugees.

Item	Factor loads				
	1	2	3	4	5
Heart pound or race	<b>0.830</b>	0.028	0.057	0.123	-0.084
Shortness of breath	<b>0.784</b>	0.112	0.169	0.193	-0.117
Dizziness	<b>0.709</b>	0.236	-0.015	0.054	0.044
Chest pain	<b>0.588</b>	0.181	0.325	0.061	0.075
Painful sexual intercourse	-0.002	<b>0.677</b>	0.128	0.087	0.001
Tired/low energy	0.385	<b>0.540</b>	-0.022	0.301	0.051
Fainting spells	0.382	<b>0.496</b>	-0.219	-0.159	-0.030
Pain in arms, legs, joints	0.375	<b>0.484</b>	0.213	0.227	0.003
Constipation/diarrhea	-0.073	-0.198	<b>0.826</b>	0.141	0.045
Headaches	0.357	0.319	<b>0.608</b>	0.054	-0.018
Back pain	0.279	0.382	<b>0.593</b>	-0.027	-0.011
Stomach pain	0.042	0.227	-0.020	<b>0.859</b>	-0.088
Nausea, gas, indigestion	0.379	-0.050	0.264	<b>0.724</b>	0.112
Menstrual cramps	0.045	0.287	0.192	0.112	<b>0.826</b>
Trouble sleeping	0.145	0.381	0.195	0.161	<b>-0.738</b>
<b>Eigenvalues</b>	4.57	1.51	1.22	1.12	1.06
<b>% of variance</b>	30.48	10.07	8.16	7.49	7.09
<b><math>\alpha</math></b>	0.78	0.56	0.55	0.68	-0.56

The table shows the five extracted factors after principal factor extraction and varimax rotation with their initial eigenvalues, the percentage of explained variance and internal consistency by Arabic-speaking refugees. Factor loads of individual items  $>0.4$  are printed bold. By logical grouping factors were defined as following: (1) symptoms of sadness, (2) pain-induced fatigue, (3) head-body related symptoms, (4) indigestion, and (5) male sleep problems.

well-established association of trauma and the expression of somatic symptoms (78) (Table 4). For the regression model with the PHQ-15 as the dependent variable, one further participant had to be excluded, since his/her studentized deleted residual of 3.19 was classified as an outlier. No participant was excluded following a regression diagnostics procedure for the model with the PHQ-9 as a dependent variable.

For the PHQ-15, results revealed that the HTQ was the only significant predictor for the PHQ-15 score ( $\beta = 0.51, p < 0.001$ ), whereas the ISMI did not reach statistical significance ( $\beta = 0.09, p = 0.16$ ). In total, this model could explain 29% of the variance in the PHQ-15 score ( $F_{(2,88)} = 18.00, p < 0.001$ ). For the PHQ-9, significant positive associations were found with both the ISMI ( $\beta = 0.25, p = 0.002$ ) and the HTQ ( $\beta = 0.57, p < 0.001$ ). Together, these two predictors accounted for 47% of the variance in the PHQ-9 score ( $F_{(2,89)} = 38.93, p < 0.001$ ). These results do not support the postulated hypothesis that internalized stigma is associated with more somatic symptom expression.

### Factor Structure of the PHQ-15 in a Sample of Arabic Speaking Refugees

Furthermore, the factor structure of all PHQ-15 items was examined in the present sample. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.724, which is above the recommended value of 0.5. Bartlett's test of sphericity was significant ( $\chi^2(105) = 334.36, p < 0.001$ ). A principal factor extraction was performed using varimax rotation. The rotated

factor matrix is depicted in Table 5. In this way, five distinct factors could be identified and were labeled with the help of an Arabic psychologist: (1) symptoms of sadness, (2) pain-induced fatigue, (3) head-body-related symptoms, (4) indigestion, and (5) male sleep problems.

### Missing Values

Lastly, a close inspection of missing values was conducted to identify any regularities. Generally, missing values were rare and occurred only in two items of the PHQ-15: The item *Menstrual cramps or other problems with your period* was not answered by three (female) participants, and the item *Pain or problems during sexual intercourse* was left unanswered by 16 participants. Of the latter ones, 14 participants identified as male.

### DISCUSSION

The present study aimed to explore the representation of depressive symptoms in a sample of Arabic-speaking refugee outpatients. Specifically, the expression of psychological and somatic distress was analyzed to inform clinicians about the most prevalent symptoms occurring within the largest refugee population in Germany. Furthermore, the prevalence of internalized stigma was examined to empirically investigate the supposed relationship between stigma and somatic symptom expression. The main results of this research show that Arabic-speaking refugee outpatients express a moderate level

of both somatic and psychological symptoms of depression, and that stigma does not seem to be associated with somatic symptoms, but rather with psychological symptoms.

The present findings add empirical evidence from a rather under-researched population to the debate about somatization and psychologization across cultures. The moderate level of somatic symptoms expressed supports clinical observational data, which have reported a high level of bodily distress in Arab mental health patients and refugees (34, 79). This is even substantiated by an in-depth analysis of single items of the PHQ-9 which shows that the most prevalent psychological symptoms were the ones that were shared and overlap with the PHQ-15, namely a “feeling of energy loss” and “sleep disturbances.” Therefore, these key depressive symptoms can be considered at least quasi-somatic, which highlights the role of somatic symptoms in Arabic-speaking refugees. Nevertheless, the rate of psychological depressive symptoms was also found to be substantial, and a moderately positive correlation was found between psychological and somatic symptoms. Even when the two overlapping items were deleted from both scales, the strength of the relationship still approached a significant, moderately positive level of association ( $r = 0.46$ ,  $p < 0.001$ ). As such, these findings are in line with the ones obtained by Lee et al. (24), who found that psychological and somatic distress coexisted in their Chinese population-based sample. Therefore, this study can be understood as another challenge for the Western mind-body dualism, as it shows that the experience of somatic distress does not preclude the simultaneous experience of psychological symptoms (26, 80).

The high prevalence of sleep problems mirrored in both the PHQ-9 and the PHQ-15 is not surprising, given that they are considered a core symptom of both depression and PTSD (81). As such, these findings are consistent with those by Sandahl et al. (82), who report that about 99% of their sample of 752 traumatized refugees reported having trouble sleeping and recurrent nightmares. Furthermore, a growing body of research shows that sleep disturbances in the context of depression have been linked to an increased risk of adverse health outcomes, including, functional impairment, an increased risk for suicidality, non-remittance, as well as decrements in mobility, self-care, cognition, pain, and interpersonal activities [for an overview see Stickley et al. (83)]. Thus, these findings have important implications for clinicians working with Arabic-speaking refugees, since interventions to improve sleep quality might have the potential to alleviate their psychological distress (81). A recently published manual for group therapy sessions with refugees can serve as a valuable source in this respect (84).

A further goal of the present research was the investigation of potential associations of internalized stigma with the representation of depressive symptoms. Contrary to the postulated hypothesis, our results show no association between stigma and somatic symptoms and thus provide no evidence for the supposed association between these constructs in the literature concerning Arab mental health (33–35). Moreover, these findings contribute to the open debate on the relation of stigma and the expression of bodily distress in cross-cultural research and substantiate evidence from previous research that

did not find such associations (31, 32). However, stigma was found to be related to the severity of psychological symptoms when trauma symptoms were controlled. Various sources have reported similar findings, yet, due to the cross-sectional study design of this and previous studies, no causal relationship can be inferred (69, 85, 86). This highlights the need for further experimental studies that seek to lower stigma and investigate whether the depression severity level can be effectively reduced through such interventions.

Interestingly, the level of internalized stigma was relatively low in the present sample. This was unexpected, given that previous research has quite consistently demonstrated a high prevalence of mental health stigma in both Arab cultures and refugee populations (36–40). In a recent study, Karnouk et al. (87) report a similarly low level of stigma in psychiatric patients from the Jordanian host- and refugee community. As a possible explanation, the authors argue that this decrease might represent the effect of current efforts in the Arab world to meet the need for mental health care services and to raise public awareness of mental health issues (88). Alternatively, this low level of stigma might be the result of sampling bias. The current convenience sample comprised of treatment seeking individuals, who voluntarily participated in a study on refugee mental health care. As such, it is to be expected that these individuals generally have lower stigma concerning mental health issues compared to the ones who denied their participation or did not seek treatment at all. Moreover, the at least basic education level, as well as the rather young mean age of the sample, might have contributed to the low level of stigma observed (89, 90). In fact, a *post-hoc* correlation analysis revealed a positive association between age and stigma ( $r = 0.27$ ,  $p = 0.010$ ), yet, no association between years of schooling and stigma was found ( $r = -0.10$ ,  $p = 0.353$ ). However, given the restricted variance in the sociodemographic variables in the sample, these results are tentative at best and such analyses are recommend for future research with a more diverse sample. Given that the demographic characteristics are similar to the ones obtained in by a representative panel study of refugees living in Germany (77), the present results concerning the low level of stigma might be transferable to the population of Arabic-speaking refugees in Germany, at least in this respect.

The explanatory approach for the identification of specific symptom clusters resulted in five independent factors that were named with the help of an Arabic psychologist: (1) symptoms of sadness, (2) pain-induced fatigue, (3) head-body related symptoms, (4) indigestion, and (5) male sleep problems. Three of these clusters have also been identified in a qualitative study with four focus groups within the Arab community in Dubai, who sought to identify the terms and descriptions that are commonly used for depressive symptoms (91). The first factor of symptoms of sadness is similar to the description of “[a] feeling of tightness or constriction in the chest [...where] the depressed person feels unable to take a deep breath [... because] the chest is felt to be too tightly packed with an excess of unpleasant feelings [...].” (p. 216). The second factor of pain-induced fatigue is described as “[f]atigue due to generalized aches [... with] a subjective feeling of lack of body energy and soundness (ta'bana), the limbs suffering the most” (p. 216). It has to be noted that



the high loading of the item painful sexual intercourse has to be interpreted with caution due to the observed missing values. Lastly, the fourth factor of indigestion resembles the cluster of “[a]llimentary symptoms in the form of nausea or sickness and poor appetite, which are attributed to the abdomen and particularly to the liver (chabid)” (p. 216).

Whereas, these three factors provide empirical evidence for clusters that have been identified by previous qualitative research (91), the interpretation of the factors three and five seems to be less straightforward. With constipation or diarrhea, headaches, and back pain, factor three comprises somatic symptoms from very different locations in the body. According to Hassan et al. such pain sensations in different body parts including “[...] cramps in the guts, or pain in the stomach or in the head [...]” (p. 23) have been found to be a typical expression of fatigue and general distress in war-affected Syrians, coupled with a perception that the organs are unable to contain the distress (92). Factor five combines the items menstrual cramps and trouble sleeping with inverse factor loadings. Since male individuals had a mean score of 0 on the item menstrual cramps, the inverse association was assumed to be indicative of a higher severity level of sleep problems in men than in women. A *t*-test supported this assumption ( $t(72.22) = -2.24, p = 0.03$ ). This is interesting, given that females have been previously found to exhibit more sleep problems compared to men (93). Further studies are necessary to investigate whether this observation describes a pattern in Arabic-speaking refugees. Also, it is suggested to perform individual factor analyses on the PHQ-15 items for males and females in studies with larger sample sizes.

These symptom clusters highlight the reciprocal relationship of explanatory models of mental illness with language and culture. In Arabic, emotions are usually described with metaphors and imagery drawn from rich poetic cultural resources (34, 92, 94). Especially references to the heart seem common for the description of depressive symptoms and distress. Hassan et al. (92) have compiled a list of commonly used expressions and idioms for distress in Syrian Arabic on the basis of suggestions by various Arabic-speaking mental health professionals. Depressive symptoms are described by a feeling of “heaviness in the heart,” “pain in the heart,” or a “squeezed heart,” or by phrases such as “blindness got to my heart” and “my heart is broken” (p. 23–26). Thus, it is not surprising that the first factor, comprising symptoms such as a pounding heart, shortness of breath, and chest pain, could explain the highest proportion of the variance in all somatic symptoms. A better understanding of such idioms might enhance a clinical conversation with Arabic-speaking mental health patients and could even inform interventions and treatment approaches (92).

The analysis of missing values revealed that specifically shame related items, including menstrual cramps and painful sexual intercourse, were occasionally left unanswered by participants. Especially males did not answer the item on sexual pain and some explained this with the absence of their wife. Even though this answer seems plausible, the pattern observed might additionally point to an often documented, still prevailing taboo of sexuality-related issues in the Arab world, as well as a lack of education on these matters (95, 96). Thus, the present findings might

argue for special care and cultural awareness when talking about sexuality-related topics with Arabic-speaking refugees in research or health care settings. Therefore, it is recommended to match patients with clinicians or interviewers of the same sex, at least at the beginning of therapy, a procedure that could not always be assured in the present research concerning the surveilling psychologist due to limited resources (97).

A particular strength of the present study lies in the selection of measures for somatic and psychological symptoms of depression that have been explicitly recommended for cross-cultural research (51). This lays the foundation for the comparison of the given results with results from studies with refugee populations from other cultural backgrounds and thus satisfies a call by Rohlf et al. (79), who criticized that the abundance of different, often non-validated measures exacerbate a global understanding of bodily distress in refugees.

The present results have to be interpreted in light of several limitations: Firstly, concerning the sample recruited the selection bias has resulted in a convenience sample that might not be representative of the population of Arabic-speaking refugees with symptoms of depression, especially concerning the level of mental health stigma. Furthermore, the convenience sample consisted of refugees from mostly Syrian descent, which might impede the generalizability to Arabic-speaking refugees in general and should thus be considered in future research. However, since the vast majority of refugees worldwide as well as in Germany originate from Syria, the sample seems representative for the underlying population. It is also highly recommended to recruit a larger sample in future research in order to analyze how variables like gender or age moderate the associations observed. Secondly, depressive symptoms were merely assessed with the PHQ-9, since clinical diagnoses were not available for all participants. It is recommended to use standardized clinical interviews or expert diagnoses in further studies to specifically investigate symptoms of Arabic-speaking refugees with a diagnosis of depression. Likewise, information concerning comorbidities, medication, or other demographic variables like residence time in Germany could not be included here, but would be vital in future research. Thirdly, the use of self-report questionnaires might have resulted in common method variance, which might have increased the observed effects in the regression analyses. Yet, it has to be noted that self-report questionnaires might be especially appropriate for research in this population, since this method has been found to reduce a respondent’s discomfort and embarrassment for sensitive issues and might thus result in more reliable data (98). Concerning the questionnaires used, it also has to be mentioned that the only the ISMI-29, but not the ISMI-10 used, has been validated in an Arabic-speaking refugee population and future research is encouraged to use validated questionnaires to minimize measurement bias. Fourthly, no comparison group was included from another cultural background. This would have been especially necessary for the analysis and interpretation of the symptom clusters found in order to infer culture-specific regularities. Therefore, the inclusion of comparison groups is highly recommended for further research. Lastly, it needs to be stressed that even though country of origin was not used as a

proxy for culture, individuals from very different backgrounds were collapsed into the category of Arabic-speaking refugees for the purpose of the present study. As suggested by Kirmayer and Ryder (21), this grouping was based on specific cultural contexts and processes such as shared language background and experiences of flight, nevertheless, this leads to an impression of a rather homogenous group which is certainly not the case.

In conclusion this study provides empirical evidence that both somatic and psychological symptoms are commonly used forms of expressing depressive symptoms in Arabic-speaking refugees, while problems with sleep and energy loss seem to be the most prevalent symptoms reported. Although these results should be interpreted with caution, it does not appear that a higher level of somatic symptom expression can be traced back to mental health stigma, but rather to culture-specific explanatory models, idioms, and expressions. The implications that arise from these findings are that mental health professionals should be trained more thoroughly in both the special mental health needs of Arabic-speaking refugees as well as in culturally mediated modes of symptom interpretation and expression. Given that refugees in Germany seldomly receive adequate mental health treatment (10), learning about typical symptoms and cultural codes might help improve our understanding of a cultural barrier, i.e., the way of expressing depressive symptoms, and might eventually contribute to faster diagnosis and better mental health care provision for the largest refugee population in Germany.

## DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

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## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethical Committee of Charité - Universitätsmedizin Berlin (EA2/070/17). The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

NL contributed to the conceptualization of the idea, data analysis and interpretation, as well as to writing. CK contributed to scale selection, data collection logistics, interpretation of the data, and supervision. EH, MB, and KB contributed to the conceptualization of the idea and study design, revision, and supervision. DR, DC, and LS contributed to scale selection and translation, as well as to data collection logistics. All authors read and approved the final manuscript.

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**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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## 2.4 The Role of Emotion Regulation as a Mediator between Early Life Stress and Posttraumatic Stress Disorder, Depression and Anxiety in Syrian Refugees

The following passage displays a summary of the article published as:

The role of emotion regulation as a mediator between early life stress and posttraumatic stress disorder, depression and anxiety in Syrian refugees. Zaynab Demir, **Kerem Böge**, Yan Fan, Corinna Hartling, Mazen Harb, Eric Hahn, Joachim Seybold, Malek Bajbouj. *Translational Psychiatry*. 10(1). doi:10.1038/s41398-020-01062-3

According to current evidence, early life stress (ELS) constitutes a crucial factor in the subsequent development of psychopathology. In the *fourth* study, we investigated the effects of ELS on post-traumatic, depressive, and anxiety symptoms in a sample of Syrian refugees. In total, 89 Syrian refugees were recruited in Amman, Jordan (n = 40) as well as Berlin, Germany (n = 49) and filled out the Cognitive Emotion Regulation Questionnaire (CERQ), Childhood Trauma Questionnaire (CTQ), Patient Health Questionnaire 9 (PHQ-9), Generalized Anxiety Disorder 7 (GAD-7), and the Harvard Trauma Questionnaire (HTQ). Mediation analysis revealed an indirect effect of maladaptive strategies between ELS and post-traumatic-, depressive-, and anxiety symptom dimensions. These novel findings highlight the role of emotional dysregulation and how it affects refugees and asylum seekers with ELS. Our findings reveal that cognitive emotion regulation represents a key element in forthcoming prevention and treatment strategies, particularly for this population.

The first four studies provided new insights into a wide range of crucial factors for refugee mental health, including expectations and preferences regarding psychotherapy, the influence of stress and social support structures on psychopathology, the presentation of somatic and psychological symptoms of depression, and the influence of stigma, and finally the role of emotion regulation as a psychological mechanism between early childhood stress and psychological symptoms. In a final step, a novel and culturally sensitive treatment approach was developed participatively with refugees and explored in comparison to routine health treatment in Germany in terms of effectiveness and cost-effectiveness.

ARTICLE

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# The role of emotion regulation as a mediator between early life stress and posttraumatic stress disorder, depression and anxiety in Syrian refugees

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## Abstract

Early life stress is an important factor in later psychopathology, including symptoms of posttraumatic stress disorder (PTSD), depression, and anxiety. The purpose of the present study was to investigate the effect of early life stress on psychiatric symptoms within a sample of Syrian refugees. In this model, the use of cognitive emotion regulation strategies was assessed as a potential mediator of the relationship between early life stress and current symptoms of PTSD, depression, and anxiety. Bootstrap analyses were generated to test the indirect effect of emotion regulation (Cognitive Emotion Regulation Questionnaire) on the relationship between early life stress (Childhood Trauma Questionnaire), PTSD (Harvard Trauma Questionnaire), depressive (PHQ-9) and anxiety (GAD-7) symptoms in eighty-nine Syrian refugees resided in Germany ( $n = 49$ ) and Jordan ( $n = 40$ ). The indirect effect of maladaptive strategies was significant between early life stress and psychopathology, whereas the mediation effect of adaptive strategies was not significant. The findings provide an evidence that emotional dysregulation is an underlying factor affecting psychological symptoms in refugees with adverse childhood experiences. These results suggest targeting cognitive emotion regulation in prospective prevention and treatment strategies.

## Introduction

There is extensive evidence for interdependencies between stress in early childhood and physical<sup>1</sup> as well as mental illnesses such as posttraumatic stress disorder (PTSD), depression, generalised anxiety, panic disorder, social phobia, substance use, and personality disorders across the lifespan<sup>2–7</sup>.

Early life stress is the exposure to single or multiple events during childhood that threaten emotional or physical well-being to the extent, that exceeds the child's

copied resources and leads to prolonged phases of stress<sup>8</sup>. Theorists have already observed specificity between certain types of adverse events in childhood and different forms of adulthood psychopathology<sup>3</sup>. For instance, Rose and Abramson<sup>9</sup> suggested that childhood emotional abuse is more likely to cause cognitive vulnerability to depression than either childhood physical or sexual abuse, because with emotional abuse depressive cognitions are directly provided to the child by the perpetrator. With repeated experiences of childhood emotional abuse, children may begin to make negative reasonings for their occurrence, which then may favor a cognitive style that would cause specific vulnerability to depression<sup>9</sup>. Consistent with these theories, self-criticism was found to be a mediator of the relationship between parental verbal abuse and later depression and anxiety<sup>10</sup>. Other studies lend further support for the mediator role of a negative cognitive style in the link of childhood emotional

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maltreatment and current depression<sup>11,12</sup>. Even though several potential mediators have been identified in the literature so far, research focusing on cognitive emotion regulation as a mediator of the relationship between early life stress and adult symptom presentations is still scarce.

The term emotion regulation has been used in different ways<sup>13</sup>, but one highly cited definition of emotion regulation is “the ability to respond to the ongoing demands of experience with the range of emotions in a manner that is socially tolerable and sufficiently flexible to permit spontaneous reactions as well as the ability to delay spontaneous reactions as needed”<sup>14,15</sup>. Cognitive emotion regulation or cognitive coping can be defined as the cognitive way of managing the intake of emotionally arousing information<sup>16</sup>. Cognitive processes may help us to regulate the emotions, and not to get overwhelmed by them during or after the experience of threatening or stressful events<sup>17</sup>. A growing body of evidence suggests that by using maladaptive strategies (i.e., self-blame, rumination, catastrophizing, and blaming-others) people may be more vulnerable to psychopathology than others, whereas adaptive cognitive styles (i.e., acceptance, positive refocusing, refocusing on planning, positive reappraisal, and putting into perspective) may lead to more resilience to symptoms of psychological distress<sup>18–20</sup>. Previous research showed that trauma, especially enduring or repeated traumatic experiences such as early life stress, seems to compromise the acquisition of appropriate emotion regulation skills<sup>21</sup>. For example, one study showed that sexually abused girls have subsequent difficulties understanding and regulating their emotions compared to nonmaltreated peers<sup>22</sup>. A related study confirms that children who have experienced neglect present less adaptive emotion regulation skills<sup>23</sup>.

Emotional dysregulation originating from early life stress appears to be relevant to the onset, maintenance, and treatment of several mental disorders, including symptoms of PTSD, depression, and anxiety disorder<sup>24</sup>. There is evidence that depressed individuals differ from controls regarding their ways of regulating their negative emotions in response to stressful events by using more frequently maladaptive emotion regulation strategies of rumination and catastrophizing, and using less frequently adaptive strategies of putting things into perspectives<sup>25–27</sup>. Additionally, maladaptive patterns of emotion regulation in anxious individuals can result in chronic avoidance and, thus as maintaining fear across time<sup>28</sup>.

One further mechanism by which exposure to early life stress may contribute to psychopathology is through a process of stress sensitization<sup>29–32</sup>, wherein individuals who have experienced early adversity have a lower threshold for developing psychopathological symptoms to recent stressors<sup>33,34</sup>. Consistent with the hypothesis, a prior study suggests that early life stress may sensitize

limbic brain regions to adult trauma exposure in certain ways that further contribute to an enhanced vulnerability to mental illnesses<sup>35</sup>. Thus, it is important to explore the relationship between early adversity, recent stressors, and psychological symptom manifestation and severity.

The current study aimed at examining the relationship between early life stress, cognitive emotion regulation strategies, and mental disorders with high prevalence, namely PTSD, depressive and anxiety symptoms, among a sample of Syrian refugees. The ongoing Syrian Civil War has caused the largest refugee displacement crisis of our time. Since March 2011 approximately eight million people are internally displaced in Syria, and four million Syrians have been forced to flee to other countries seeking safety and protection<sup>36–40</sup>. Compulsory migration, the experience of traumatic events both within their country of origin and in the host countries as well as resettlement in unfamiliar cultural settings with challenging socio-economic circumstances generally leads to a higher risk for psychiatric morbidity, including symptoms of PTSD, depression, and generalised anxiety disorders<sup>41–43</sup>. However, studies evaluating psychiatric disorders among Syrian refugees show heterogeneity in prevalence rates of PTSD (from 20.5 to 35.7%), depression (from 20 to 43.9%) and anxiety disorder (from 19.3 to 31.8%), mainly due to different methodologies implemented<sup>44–49</sup>.

To the best of our knowledge, no research has investigated the interaction of early adversities, emotion regulation as a mediating factor, and mental health outcome among Syrian refugees. However, examining these relevant mental health factors in this sample group is crucial, since Syrian individuals may be less likely to seek specialty mental health treatment than other groups<sup>50,51</sup> and at the same time, they are highly vulnerable to mental disorders due to multiple war exposure, flight and therewith associated traumatic experiences. Even when mental health and psychosocial services in the Syrian host communities are available, refugees may still be unable to access these services due to several factors, including cultural and linguistic barriers, the stigma associated with seeking mental health, and the power dynamics of the helping relationship<sup>52</sup>. Similarly, little attention is given to emotion regulation despite available evidence as a coping resource for positive changes and well-being<sup>53,54</sup>. Hence, we primarily sought to investigate whether emotion regulation plays a crucial role in regard to resilience to psychiatric symptoms among Syrian refugees.

In the present investigation, we sought to characterize the relationship between cognitive emotion regulation strategies, early life stress, PTSD, depressive, and anxiety symptoms. We hypothesised that participants with adverse childhood experiences would use more maladaptive and fewer adaptive cognitive emotion regulation strategies. Further, we hypothesised that these tendencies



would influence current psychopathological symptoms. A further aim of the present study was to explore the potentially interactive role of recent trauma, namely exposure to the Syrian Civil War, in the stress sensitization effect of early adversity. According to the predictions of the stress sensitization model, it was hypothesised that individuals who have experienced greater extent to early adversity will demonstrate increased levels of symptom severity following subsequent trauma exposure in adulthood.

## Methods and materials

### Participants and procedures

During the 14-month study period from January 2017 to March 2018, eighty-nine Syrian refugees resettled in Germany ( $n = 49$ ) and Jordan ( $n = 40$ ) participated in the current research. In Berlin, participants were recruited at the Central Clearing Clinic, an outpatient institution by Charité—Universitätsmedizin Berlin, specialized in offering psychiatric services for refugees and collaborating with multiple refugee camps and civic initiatives. In Amman, participants were recruited by the German humanitarian NGO “Help-Hilfe zur Selbsthilfe”. Eligibility criteria included being 18–65 years of age, literate in Arabic language and having been exposed to the Syrian Civil War from 2011. Exclusion criteria included a lifetime diagnosis of psychotic disorder, bipolar disorder, personality disorder, mental retardation, any mental disorder due to a general medical condition and drug addiction. Participants were informed about the anonymity of information collected and their right to withdraw from the study at any time without giving a reason, or fearing of impacts on the services received by any governmental or nongovernmental organisation. Ethical approval (EA4/067/10) for the study was granted by the Institutional Review Board of Charité—Universitätsmedizin Berlin according to the Declaration of Helsinki. All subjects provided written informed consent and were financially reimbursed for participation.

### Questionnaires

The severity of depressive symptoms was assessed using the total score of the self-reported Patient Health Questionnaire-9 (PHQ-9)<sup>55</sup>. The PHQ-9 score can range from 0 to 27 since each of the nine items can be scored from 0 (not at all) to 3 (nearly every day) with higher scores indicating more severe depressive symptoms. The Arabic version of the PHQ-9 has been well validated<sup>56–58</sup>. In the present study, the PHQ-9 total score displayed good internal consistency (Cronbach's  $\alpha = .85$ ).

The self-reported Generalized Anxiety Disorder-7 (GAD-7)<sup>59</sup> measures the severity of anxiety symptoms with a range from 0 to 21. Each of the seven items can be scored from 0 (not at all) to 3 (nearly every day). The

GAD-7 questionnaire was provided in a validated Arab version<sup>57,60</sup>, and was found to be highly reliable (Cronbach's  $\alpha = .86$ ) in the current study.

The Harvard Trauma Questionnaire (HTQ)<sup>61,62</sup> is a self-rated questionnaire assessing multiple refugee-specific facets of torture, trauma, and PTSD symptom severity that participants might have experienced in the home country, during the escape or in the host country. The first part comprises of 42 items illustrating traumatic events, such as lack of food and clean water, torture, rape, and murder of a family member or a friend, which are rated on a dichotomous scale: yes<sup>44</sup> and no (0). The total score was the sum of all scores for each of the 42 items. The second part consists of an open-ended question asking the participants to describe the most hurtful/terrifying experience and to indicate whether this happened during the war, while fleeing, or in the host country. The third part encompasses 16 items, assessing PTSD symptom severity. Responses represent how often participants had experienced each trauma symptom (e.g., “feeling detached or withdrawn from people”, “difficulty concentrating”, or “trouble sleeping”). The HTQ total score is an average score, based on a range of responses from 1 (not at all) to 4 (extremely) for each symptom, with higher scores indicating an ascending level of PTSD symptom severity. It is a commonly used scale that has been validated in multiple cultures and languages<sup>42,63</sup>. For the current study, the Arabic version of the HTQ was used, which has already been validated with Iraqi refugees<sup>63</sup>. Previous studies have demonstrated sufficient validity and a good test–retest reliability<sup>63,64</sup>. In the current study, part one and three displayed good internal consistency with .89 and .87, respectively.

We used a retrospective self-report measure, the Childhood Trauma Questionnaire (CTQ)<sup>65</sup> to assess the extent of early life stress that subjects had experienced. The CTQ consists of 28 items with five subscales. Items are rated on a five-point frequency scale from 1 = never true to 5 = very often true and summed up to give a total score for each type of trauma, ranging from 5 to 25 with higher scores indicating a more extensive exposure to that kind of stressful experience. Previous studies have demonstrated good convergent and discriminant validity, as well as good sensitivity and at least satisfactory specificity for the CTQ total score<sup>66,67</sup>. In the present study, the internal consistency of the CTQ total score is satisfying, with Cronbach's  $\alpha = .84$ .

The Cognitive Emotion Regulation Questionnaire (CERQ)<sup>17</sup> was used to evaluate cognitive emotion regulation strategies used to respond to stressful events. It is a 36-item inventory that uses a five-point Likert scale to assess nine strategy subscales. In the present study, the nine subscales were categorized into maladaptive (CERQ-M) and adaptive (CERQ-A) strategies, and scores for both

were summed from the relevant subscales. The Arabic version of the CERQ shows solid convergent validity and moderate to high reliabilities for each subscale<sup>68</sup>.

### Statistical analysis

Covariate distribution was investigated with *t*-tests, contingency tables, and Pearson or Spearman correlation for normally and non-normally distributed variables, respectively. Descriptive statistics are reported as mean  $\pm$  standard deviation. We planned a simple mediation analysis with bootstrapping techniques using the PRO-CESS macro for SPSS (version 3.0; Hayes, 2015). Overall, we performed six models, using consistently the total CTQ score (early life stress) as an independent variable. HTQ (PTSD), PHQ-9 (depression), and GAD-7 (anxiety) scores served as dependent variables in separately calculated models. CERQ-M (maladaptive cognitive emotion regulation) and CERQ-A (adaptive cognitive emotion regulation) subscores from the CERQ were mediating variables each time while controlling for age, gender, and educational level. We performed 10,000 bootstrap samples to generate a 90% bias-corrected confidence interval of the indirect effect  $a \times b$ . In our mediation analysis, the *a* path represented the path from early life stress to adaptive/maladaptive cognitive emotion regulation, and the *b* path represented the impact of the mediator, adaptive/maladaptive cognitive emotion regulation, on PTSD, depressive, and anxiety symptoms. The output from our model also included path *c*, the total impact of early life stress on adulthood PTSD/depressive/anxiety symptoms, and *c'*, the direct impact of early life stress on PTSD/depressive/anxiety symptoms when accounting for adaptive/maladaptive cognitive emotion regulation. The Sobel-test was also used to confirm the significance of our mediation effects. The significance threshold was set at  $p < 0.05$  and a one-tailed test was chosen for hypothesis testing. Additionally, we conducted a moderation model with total CTQ score serving as an independent variable, while HTQ, PHQ-9, and GAD-7 total scores were used again as dependent variables in separately calculated models. In this model, the first part of HTQ, representing adult trauma, was the moderating variable. To adjust for possible confounding effects, we included gender, age, and educational level as covariates. All statistical analyses were carried out using Predictive Analysis Software, version 25.0 (SPSS Inc., 2017).

## Results

### Demographics and psychiatric symptoms

Table 1 presents the demographic characteristics and social circumstances of the eighty-nine Syrian refugee participants. The mean age was 34.0 ( $\pm 10.18$ ) years, and 53.4% ( $n = 47$ ) of the participants were female. Of the total sample, 59.1% were married, 36.4% were single, 1.1% were

**Table 1 Demographic characteristics of participants.**

Characteristic	Mean (SD, range)/%
Age	34.0 (10.18, 41)
Gender (Female)	53.4%
Marital status (Married)	59.1%
Educational level (High school)	27.3%
Escape with family	67.0%
Months escaped from Syria	43 (20.79, 80)
Months resided in host country	39 (21.6, 84)

**Table 2 Clinical characteristics of participants.**

Characteristic	Mean (SD, range)
Depression (PHQ-9)	10.22 (5.81, 26)
Anxiety (GAD-7)	8.75 (5.02, 20)
Posttraumatic disorder (HTQ)	2.2 (0.53, 2.44)
Early life stress (CTQ)	35.31 (9.76, 38)
Maladaptive cognitive emotion regulation strategies (CERQ-M)	45.49 (10, 47)
Adaptive cognitive emotion regulation strategies (CERQ-A)	69.2 (12.28, 58)

widowed, and 3.4% were divorced. 19.3% have a master's degree, 13.6% a bachelor's degree, 27.3% a high school certification, and 39.8% a lower or none school graduation. During the journey to the host country ( $n = 49$  in Germany and  $n = 40$  in Jordan), 67.0% fled with family members, 5.7% with friends or acquaintances, while 27.3% crossed the borders alone. The mean time since the flight from Syria was 43 ( $\pm 20.79$ ) months, and the mean time of the resettlement in the host country was 39 ( $\pm 21.6$ ) months.

Table 2 summarizes all clinical outcomes, including mean, standard deviation, and range. The overall mean PHQ-9 score was 10.22 ( $\pm 5.81$ ), which is below the level for clinically significant depression. In this sample, 21.3% of participants met the cut-offs for mild, 29.2% for moderate, 30.3% for moderately severe, and 18% for severe depression. The mean GAD-7 score was 8.75 ( $\pm 5.02$ ), indicating, on average, mild anxiety in the study sample. 27% of respondents were above the cut-offs for mild, 36% for moderate, and 34.8% for severe generalized anxiety disorder. Using the HTQ, 30.3% of refugees met the cut-off for PTSD. The mean CTQ score was 35.31 ( $\pm 9.76$ ), indicating that participants reported moderate to severe childhood traumatic experiences. 29.5% of

respondents reported no history of early life stress, 6.8% reported mild, 22.7% moderate, and 40.9% severe level of early life stress. 26.1% ( $\pm 2.9$ ) of subjects indicated having experienced emotional abuse, another 20.5% ( $\pm 2.74$ ) reported physical abuse, and 29.5% ( $\pm 2.15$ ) sexual abuse. 36.4% ( $\pm 3.33$ ) of participants reported emotional neglect, and 34.1% ( $\pm 2.45$ ) experienced physical neglect. Mean CERQ-M and CERQ-A scores were 45.49 ( $\pm 10.0$ ) and 69.2 ( $\pm 12.28$ ), respectively. The mean CERQ-M score ( $46.33 \pm 11.20$ ) was similar, and the mean CERQ-A score ( $56.41 \pm 14.01$ ) was higher than those of Korean patients in a comparable study<sup>69</sup>. An independent-samples *t*-test was conducted to compare the sociodemographic variables of the two subsample groups: Berlin and Amman. There was a significant difference in mean age between refugees in Berlin ( $M = 30.13$ ,  $SD = 8.03$ ) and Amman ( $M = 38.65$ ,  $SD = 10.62$ );  $t(86) = -4.28$ ,  $p < .001$ . The mean CERQ-M score for refugees in Amman ( $M = 48.91$ ,  $SD = 9.33$ ) was significantly higher than that of refugees in Berlin ( $M = 42.58$ ,  $SD = 9.71$ );  $t(85) = -3.09$ ,  $p = .003$ . Concerning clinical symptoms in both cohorts, results for depressive (8.31 in Berlin and 9.55 in Amman, PHQ-9 score) and anxiety symptoms (7.89 in Berlin and 9.60 in Amman, GAD-7 score) were comparable and therefore both at the cut-off threshold from mild to moderate symptom severity. Furthermore, a similar amount of trauma experiences was marked in both groups of refugees (16 items in Berlin, 18 items in Amman out of 43 items of the first part of HTQ). With a cut-off score for current PTSD set at  $>2.5$ , participants from Berlin presented PTSD symptoms bordering the diagnostic threshold (2.11). Similar to the Berlin cohort, participants from Amman displayed post-traumatic stress symptoms at the diagnostic boarder (2.31). Interestingly, statistical comparisons regarding clinical outcomes between subsamples demonstrated significant differences in PTSD symptoms ( $p < .04$ ). We found substantial comorbidity among those refugees with psychological symptoms: while 12 (=13.5%) of the 89 respondents were suffering from one disorder only, 40 (44.9%) were screened positively for two and 24 (27%) for all three diseases. Remarkably, all refugees with PTSD symptoms in our sample were suffering simultaneously from depressive and anxiety disorder ( $n = 24$ ).

#### Correlation for early life stress, maladaptive/adaptive cognitive emotion regulation strategies, current posttraumatic disorder, depression, and anxiety

The correlation matrix for all variables is provided in Table 3. Early life stress was positively correlated with the use of maladaptive cognitive emotion regulation strategies ( $r = .181$ ,  $p < .05$ ), with PTSD ( $r = .291$ ,  $p < .01$ ), depression ( $r = .351$ ,  $p < .01$ ), and anxiety ( $r = .287$ ,  $p < .01$ ). Maladaptive cognitive emotion regulation strategies were

**Table 3 Correlation among early life stress, cognitive emotion regulation strategies, post-traumatic disorder, depression, and anxiety.**

	CTQ	CERQ-M	CERQ-A	PTSD	PHQ-9	GAD-7
CTQ						
CERQ-M	.181*					
CERQ-A	.076	.111				
PTSD	.291**	.506**	-.161			
PHQ-9	.351**	.344**	-.107	.711**		
GAD-7	.287**	.374**	-.09	.708**	.768**	

CTQ childhood trauma questionnaire (early life stress), CERQ-M maladaptive subscales of cognitive emotion regulation questionnaire (Maladaptive cognitive emotion regulation), CERQ-A adaptive subscales of cognitive emotion regulation questionnaire (Adaptive cognitive emotion regulation), PTSD posttraumatic stress disorder, PHQ-9 patient health questionnaire-9 (Depression), GAD-7 generalized anxiety disorder-7 (Anxiety),

\* $p < .05$ .

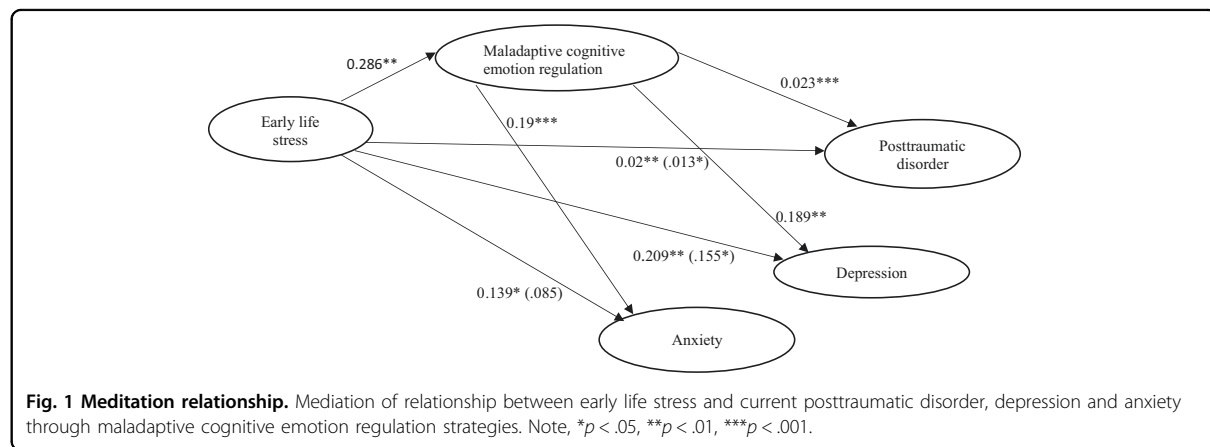
\*\* $p < .01$ .

positively correlated with PTSD ( $r = .506$ ,  $p < .01$ ), anxiety severity ( $r = .374$ ,  $p < .01$ ), and depressive symptoms ( $r = .344$ ,  $p < .01$ ). Early life stress, PTSD, depressive, and anxiety symptoms were not significantly correlated with adaptive cognitive emotion regulation strategies.

#### Model of early life stress and PTSD/depression and anxiety severity mediated by cognitive emotion regulation strategies

Figure 1 displays the relationship between early life stress and later posttraumatic disorder, depressive, and anxiety symptoms as mediated by maladaptive cognitive emotion regulation strategies. The total effect of early life stress on current posttraumatic disorder is estimated as  $c = .02$  with  $p < .01$ , and the direct effect is estimated as  $c' = .013$  with  $p < .05$ . The path coefficients were both significant: the path from early life stress to maladaptive cognitive emotion regulation strategies ( $\beta = .286$ ,  $p < .01$ ) and the path from maladaptive cognitive emotion regulation strategies to PTSD ( $\beta = .023$ ,  $p < .001$ ). The bootstrapping index for an indirect effect ( $a \times b = .007$ ) was significant when maladaptive cognitive emotion regulation strategies were included as mediating variables since the 90% confidence interval does not include zero [.003, .011]. Therefore, the mediating effect of overall maladaptive cognitive emotion regulation strategies on the relationship between early life stress and PTSD was significant.

There were significant indirect effects ( $a \times b = .054$ ) of early life stress on adulthood depressive symptoms through maladaptive emotion regulation strategies with a 90% confidence interval that does not include zero [.015, .108]. The direct path from early life stress to depression was also significant ( $c' = .155$ ,  $p < .05$ ), showing that maladaptive cognitive emotion regulation



strategies partially mediated the association between early life stress and later depression severity.

The total effect of early life stress on anxiety is estimated as  $c = .139$  with  $p < .05$  and the direct effect is estimated as  $c' = .085$  with  $p = .164$ , thus not significant. However, the path coefficients from early life stress to maladaptive cognitive emotion regulation strategies ( $\beta = .286$ ,  $p < .01$ ) and from maladaptive cognitive emotion regulation strategies to anxiety ( $\beta = .19$ ,  $p < .001$ ) were both significant. The bootstrapping index for an indirect effect ( $a \times b = .054$ ) was significant when maladaptive cognitive emotion regulation strategies were included as mediating variables because the 90% confidence interval does not include zero [.017, .105], suggesting that maladaptive cognitive emotion regulation strategies fully mediated the relationship between early life stress and current anxiety symptoms.

Neither the paths from early life stress to adaptive cognitive emotion regulation strategies nor from adaptive cognitive emotion regulation strategies to PTSD, depression, and anxiety were significant (all  $p > .05$ ). The bootstrapping index for an indirect effect ( $a \times b$ ) was not significant when adaptive cognitive emotion regulation strategies were included as mediating variables. Therefore, the mediating effect of overall adaptive cognitive emotion regulation strategies on the relationship between early life stress and psychiatric symptoms was not significant.

#### Model of early life stress and PTSD/depression and anxiety severity moderated by adult trauma

To examine whether experiences of adult trauma have a moderating effect on the relationship between early life stress and psychopathology, we applied a moderation model. Regarding our sample, there was no significant moderating influence of current trauma on the relationship between early life stress and mental illnesses (all  $p > .05$ ).

#### Discussion

In the current investigation, a mediation model was tested in order to examine the relationship between early life stress, current PTSD, depressive, and anxiety symptoms, as well as cognitive emotion regulation strategies among a Syrian refugee sample. Consistent with our hypothesis, maladaptive strategies partially mediated the effect of early life stress on PTSD and depressive symptoms of Syrian refugees. Our results are congruent with prior research proposing that the use of maladaptive strategies is an important mechanism underlying the negative effect of early life stress on psychological dysfunctions and early traumatic experience, which can further lead to impaired emotion regulation in later life<sup>70</sup>. Maladaptive appraisal originating from early life stress might, in turn, cause vulnerability to various mental health symptoms<sup>71,72</sup>.

One recent study with a clinical sample provided support for the mediating role of emotion regulation in the association between early life stress to both depression severity as well as lifetime persistence<sup>73</sup>. Within this sample, bootstrapping-enhanced mediation analyses indicated that specific emotion regulation skills significantly mediated the relationship between early life stress and depression severity. Another study examined the mediating role between emotion regulation strategies, current depression, and comorbid anxiety with respect to specific types of trauma<sup>69</sup>. Accordingly, emotional neglect was associated with difficulties in adaptive emotion regulation, whereas the mediation effect of maladaptive strategies was restricted to emotional abuse.

Notably, in our mediation model, maladaptive emotion regulation fully mediated the relationship between early life stress and anxiety symptoms, which is in line with findings of a study with a Korean cohort<sup>69</sup>. Consequently, there is an enormous need for continuous research investigating whether different psychopathologies are

related to the use of specific emotion regulation strategies. A recent study suggested that the usage of maladaptive strategies can be considered as a general feature of depression and anxiety disorders<sup>74</sup>. However, anxious individuals attempted to suppress their emotions more likely than their depressed counterparts, whereas patients with depressive symptoms reported having used rumination more frequently than their anxious counterparts<sup>74</sup>. It will particularly be relevant for future research to identify, which concrete strategies are more protective or risk factors for certain types of psychiatric symptoms. Thus, subsequently, it can be ensured that these strategies are specifically targeted by prevention and intervention programmes.

However, in contrast to our assumptions, the mediating effect of adaptive coping strategies on the relationship between early life stress and psychiatric symptoms showed no significant associations. Interestingly, this result indicates similarity to a prior study, claiming that the indirect effect of adaptive emotion regulation strategies was weaker compared to maladaptive emotion regulation strategies<sup>69</sup>. Another study found out that maladaptive strategies (i.e., rumination, suppression, and avoidance) were more strongly associated with psychopathology than adaptive strategies (i.e., reappraisal, acceptance, and problem-solving), providing the support that adaptive strategies might play a minor role in the cognitive emotion regulation process compared to maladaptive strategies<sup>75</sup>. One possible explanation is that in contrast to maladaptive strategies, the implementation and following effects of adaptive strategies might depend on the context. For example, reappraisal might only be used adaptively if at all possible, whereas rumination seems to be maladaptive across time<sup>76</sup>.

Additionally, the effects of cognitive processes may depend on the clinical symptom severity<sup>77</sup>. For instance, individuals with mental disorders may fail to respond to stress with reappraisal because their maladaptive tendencies may be distinct to a significantly greater degree than their adaptive abilities. Thus, displaying a weaker significant indirect effect of adaptive strategies on the relationship between early life stress and adult symptom severity<sup>75</sup>.

Furthermore, we considered that adaptive coping strategies might be a potential moderator between early life stress and mental health problems, instead of having a mediating role. In a recent study, a significant interaction between the habitual usage of reappraisal (thought to be adaptive) and the exposure of emotional abuse on neural networks was revealed<sup>78</sup>. Based on this study, we tested a moderation model with early life stress and PTSD/depressive/anxiety symptoms as well as an adaptive emotion regulation strategy as moderating variable, while controlling for sociodemographic

variables such as age, gender, and educational level. However, in our moderation model, there was no significant interaction between adaptive strategies and adverse childhood experiences. Thus, based on our data, we were not able to confirm the role of adaptive coping as a moderator between early life stress and adult psychopathology. More research is required in this field in order to further investigate the exact role of adaptive emotion regulation regarding the relationship between early life stress and psychiatric symptoms.

Regarding our sample, there was no significant interaction of war exposure on the relationship between early life stress and psychopathology. Based on our current cross-sectional data with refugees, it seems that early life stress and later life trauma seem to be independently associated with mental disorders. A recent study suggests similar outcomes in a military veteran sample showing that early life stress, combat exposure, and adult PTSD differentially predict alterations in amygdala and hippocampus connectivity<sup>79</sup>. However, it remains unclear whether war exposure is associated with stress sensitization and, if so, whether this effect is lasting or temporary. Future research is required to identify through which mechanisms the exposure to stress in early and later life lead to current mental problems. Therefore, it is essential to further investigate the occurrence and duration of stress sensitization prospectively following exposure to current stressors using longitudinal study designs.

Several limitations need to be considered in this study. First, all variables were assessed with self-report questionnaires. Generally, retrospective assessments rely on the accuracy of the participant's memory and some types of mental disorders are associated with certain memory distortions. For example, avoidance and gaps in memories concerning traumatic events are major symptoms of PTSD<sup>21</sup>, and are also related to symptoms of depression and anxiety<sup>75</sup>. Retrospective reports of particularly early life stress may be prone to reporting bias. Notably, in our sample the prevalence of early life stress, especially for severe level of adverse childhood experiences, was high. Memory recalls of early adversity have been questioned for their accuracy as they may be influenced by current psychopathology<sup>21,75</sup>. Indeed, in the present study clinically significant symptoms of PTSD, depression, and anxiety were illustrated among Syrian refugees. However, previous research identified several predictors for robust memory, e.g., older age when the abuse ended, more severe experiences, and reported high levels of PTSD symptom severity<sup>80,81</sup>. Therefore, there is little reason to link psychopathology with less reliable and valid reports of early adversity<sup>82,83</sup>. Nevertheless, additional research is needed to explore the processes through which early life stress contributes to enhanced memory. Additionally, recent findings suggested that retrospective and

prospective measures of early life stress may identify different groups of individuals, and therefore need to be considered separately<sup>84</sup>. Thus, assuming that the associated health outcomes and underlying risk mechanisms are the same in both groups may be inaccurate<sup>84</sup>. Second, the mediation model is cross-sectional, which limits any firm conclusions regarding the causality or temporal onset of emotional dysregulation and psychopathological symptoms<sup>85</sup>. Prospective longitudinal studies serially assessing changes in emotion regulation ability and mental health outcomes are required. Third, other potentially impactful factors on the current symptomatology (i.e., onset or length of the trauma and relationship with the perpetrator) were not evaluated with respect to early life stress. Fourth, cognitive emotion regulation is only a limited part of emotion regulation. Other types of maladaptive appraisals such as avoidance or suppression play an important role in the psychopathology of PTSD, depression, and anxiety<sup>75</sup> and, therefore might be relevant regarding the relationship between early life stress and the aforementioned mental disorders. Fifth, we recruited Syrian refugees resettled in Amman as well as in Berlin. Thus, differences in the duration of the flight, cultural, and language challenges, and socioeconomic circumstances might also influence current symptom severity that needs to be evaluated in further investigations by our research group. As differences regarding PTSD symptom severity between subsamples were significant ( $p < .04$ ), we calculated our mediation model for both groups separately. For the cohort in Berlin, we could confirm the significant mediating effect of maladaptive cognitive emotion regulation strategies on the relationship between early life stress and PTSD symptoms ( $p < .01$ ). Yet, related to the cohort in Amman, the mediating effect of maladaptive cognitive emotion regulation on the relationship between early life stress and PTSD symptoms was not significant ( $p > .05$ ). Thus, there is a need to explore possible reasons why Syrian refugees resettled in Amman suffer more frequently from severe PTSD symptoms than those resided in Berlin and, instead of maladaptive appraisal, which potential mediators may influence the link between early adversity and psychopathology among Syrians seeking refuge in Amman.

Despite its limitations, the present study provides evidence for the mediating role of maladaptive cognitive emotion regulation between early life stress and current PTSD, depressive, and anxiety symptoms in a Syrian refugee population. This is of relevance since the migration of vulnerable groups is a global challenge of increasing importance. Cognitive emotion dysregulation may be an important factor for patients who experienced early life stress and currently present with PTSD, depressive, and anxiety symptoms. Consequently, developing therapies that target emotion dysregulation can help in further

enhancing the effectiveness of current treatments and prevention strategies and thus strengthen the resilience of Syrian individuals to mental health problems.

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#### Conflict of interest

The authors declare that they have no conflict of interest.

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## 2.5 Effectiveness and Cost-effectiveness for the Treatment of Depressive Symptoms in Refugees and Asylum Seekers: a Multi-centred Randomized Controlled Trial

The following passage displays a summary of the article published as:

Effectiveness and Cost-effectiveness for the Treatment of Depressive Symptoms in Refugees and Asylum Seekers: a Multi-centred Randomized Controlled Trial. **Kerem Böge\***, Carine Karnouk\*, Andreas Hoell, Mira Tschorn, Inge Kamp-Becker, Frank Padberg, Aline Übleis, Alkomiet Hasam, Peter Falkai, Hans-Joachim Salize, Andreas Meyer-Lindenberg, Tobias Banaschewski, Frank Schneider, Ute Habel, Paul Plener, Eric Hahn, Maren Wiechers, Michael Strupf, Andrea Jobst, Sabina Millenet, Edgar Hoehne, Thorsten Sukale, Raphael Dinauer, Martin Schuster, Nassim Mehran, Franziska Kaiser, Stephanie Bröcheler, Klaus Lieb, Andreas Heinz\*. Michael Rapp\*, Malek Bajbouj\*. *LANCET Regional Health - Europe*, 19, 100413. doi:10.1016/j.lanepe.2022.100413 \*shared authorship

Recent research points toward high rates of psychological distress in refugee populations, which leads to a wide treatment gap at the juncture with a scarcity of resources and various financial, linguistic, and cultural barriers. In the *fifth* study, we developed a novel culturally sensitive Stepped Care and Collaborative Model (SCCM) to examine the model's overall effectiveness and cost-effectiveness in reducing depressive symptoms in RAS, compared with treatment-as-usual (TAU) in Germany's health care system. The main assessments used to determine primary outcomes were the self-rated Patient Health Questionnaire 9 (PHQ-9) and the rater-blinded Montgomery-Åsberg Depression Rating Scale (MADRS). A multicentre, rater-blinded, randomized controlled trial was conducted across eight university sites in Germany, with 584 participants randomly receiving either SCCM or TAU for an intervention period of three months. Overall, we found that participants in the SCCM condition showed significantly greater reductions in depressive symptoms compared to participants in the TAU condition. Moreover, our findings provided evidence for the overall cost-effectiveness of the SCCM in comparison to TAU. Consequently, the novel culturally sensitive SCCM is more cost-effective and effective in alleviating depressive symptoms in refugees and asylum seekers compared with routine health care in Germany. These study

outcomes support a scalable and adequate model to provide mental health care for this vulnerable population, especially in settings with limited resources.



# Effectiveness and cost-effectiveness for the treatment of depressive symptoms in refugees and asylum seekers: A multi-centred randomized controlled trial

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## Summary

**Background** Current evidence points towards a high prevalence of psychological distress in refugee populations, contrasting with a scarcity of resources and amplified by linguistic, institutional, financial, and cultural barriers. The objective of the study is to investigate the overall effectiveness and cost-effectiveness of a Stepped Care and Collaborative Model (SCCM) at reducing depressive symptoms in refugees, compared with the overall routine care practices within Germany's mental healthcare system (treatment-as-usual, TAU).

**Methods** A multicentre, clinician-blinded, randomised, controlled trial was conducted across seven university sites in Germany. Asylum seekers and refugees with relevant depressive symptoms with a Patient Health Questionnaire score of  $\geq 5$  and a Refugee Health Screener score of  $\geq 12$ . Participants were randomly allocated to one of two treatment arms (SCCM or TAU) for an intervention period of three months between April 2018 and March 2020. In the SCCM, participants were allocated to interventions tailored to their symptom severity, including watchful waiting, peer-to-peer- or smartphone intervention, psychological group therapies or mental health expert treatment. The primary endpoint was defined as the change in depressive symptoms (Patient Health Questionnaire-9, PHQ-9) after 12 weeks. The secondary outcome was the change in Montgomery Åsberg Depression Rating Scale (MADRS) from baseline to post-intervention.

**Findings** The intention-to-treat sample included 584 participants who were randomized to the SCCM ( $n=294$ ) or TAU ( $n=290$ ). Using a mixed-effects general linear model with time, and the interaction of time by randomisation group as fixed effects and study site as random effect, we found significant effects for time ( $p < .001$ ) and time by group interaction ( $p < .05$ ) for intention-to-treat and per-protocol analysis. Estimated marginal means of the PHQ-9

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scores after 12 weeks were significantly lower in SCCM than in TAU (for intention-to-treat: PHQ-9 mean difference at  $T_1$  1.30, 95% CI 1.12 to 1.48,  $p < .001$ ; Cohen's  $d=0.23$ ; baseline-adjusted PHQ-9 mean difference at  $T_1$  0.57, 95% CI 0.40 to 0.74,  $p < .001$ ). Cost-effectiveness and net monetary benefit analyses provided evidence of cost-effectiveness for the primary outcome and quality-adjusted life years. Robustness of results were confirmed by sensitivity analyses.

**Interpretation** The SSCM resulted in a more effective and cost-effective reduction of depressive symptoms compared with TAU. Findings suggest a suitable model to provide mental health services in circumstances where resources are limited, particularly in the context of forced migration and pandemics.

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**Keywords:** Stepped-care and collaborative model; Refugees; Asylum seekers; Depression; Germany; Mental health care; SCCM; Interventions; Cost-effectiveness

### Research in context

#### *Evidence before this study*

We searched PubMed and Google Scholar for recently published studies, nationwide surveys and official reports from the World Health Organization (WHO) regarding recent migration movements and the prevalence of mental illness among refugee populations in Europe and the Middle East. Current evidence points towards a high disease burden in Europe's refugee population, contrasting with a scarcity of available resources and culturally adapted treatment options in existing mental health care settings. Several linguistic, systemic, financial and cultural barriers thematically appeared in our research. In a parallel literature review, numerous RCTs had confirmed the efficacy of stepped care and collaborative models (SCCM) for the successful and cost-efficient treatment of psychiatric disorders.

#### *Added value of this study*

MEHIRA was tailor-designed to provide a wide range of culturally adapted mental health care services. Matching symptoms to a suitable and innovative psychological intervention showed to be both successful and cost-effective at reducing depressive symptoms in our refugee sample. Our study outcomes reveal evidence for overall high clinical- and cost-effectiveness of this model. To our knowledge, no other studies to date have investigated the efficacy of a culturally adapted SCCM. Findings from our RCT confirm the success of this model in its adaptability to different contexts both in crisis situations, but also in low- and middle-income countries, where the demand for medical care is high, but resources are scarce. The model also provides solutions to various barriers and resource scarcity simultaneously.

### *Implications of all the available evidence*

Our findings suggest an adaptable model that can strengthen mental health care services for groups seeking psychological care in restricted contexts. SCCM's are sustainable, cost-effective and resource saving hybrid models, representing a combination of traditional and digital mental health care services. If adopted, they can provide benefits to both mental health care systems and individuals who are seeking care by filling an existing gap and overcoming different challenges at once.

### Introduction

As a consequence of pandemics, natural disasters or armed conflicts such as in the Ukraine or Syria, mental health care systems face tremendous challenges.<sup>1</sup> Financial, structural, and cultural barriers, coupled with an increased disease burden, have led to large treatment gaps in many parts of the world.<sup>2</sup> Across the globe, healthcare systems are often characterised by a scarcity of resources and a lack of specialised expertise,<sup>3</sup> resulting in health care disparities and marginalisation of minority groups.<sup>4</sup> Consequently, intervention models intelligently allocating resources and catering to a large number of people at low cost, but with high effectiveness, are needed.<sup>2,5,6</sup>

A case example highlighting the need for alternative solutions can be currently observed in the context of the large migration movements, for example in the ongoing war in the Ukraine, or recent migration movements of populations of predominantly Farsi or Arab backgrounds (constituting 65% of Germany's refugee population<sup>7</sup>) from the Middle East to Europe in 2015. In that

time, Europe was faced with an unexpected challenge to accommodate over two million refugees who needed protection, shelter and medical assistance.<sup>8</sup> Around 400,000 of the incoming refugees between the years of 2010 and 2019 (with a peak in 2015) were unaccompanied and separated minors, many of whom applied for asylum in Germany.<sup>9</sup> Mental healthcare systems in Europe and Germany<sup>5</sup> were and are still not prepared to meet the healthcare needs of incoming populations<sup>5</sup> that has experienced severe psychological distress<sup>10,11</sup> and in which a significant proportion showed depression, PTSD and anxiety, preventing them from social and economic integration.<sup>12</sup> These patients posed a great challenge to Germany's health care system, due to systemic, organizational, cultural and linguistic barriers, despite its robustness.<sup>5</sup> Other host countries have highlighted similar challenges.<sup>13</sup> For this population, a lack of preparedness became apparent especially concerning culturally-sensitive interventions. This is noteworthy especially because even before the civil war in Syria large minorities already lived in Germany for decades and their specific needs were not addressed sufficiently. As a result, two interrelated challenges have surfaced: first that mental health systems were not tailored to the needs of minorities and second, that institutions lack the flexibility to quickly adapt to changing environments.<sup>14</sup>

Current evidence points towards a frequent and urgent plea for sustainable, accessible, culturally-sensitive and innovative mental health care models that are scalable, resource-saving and cost-effective.<sup>1,2,6</sup> Stepped Care and Collaborative models (SCCM) represent hybrid systems that offer collaborative and individualized treatments ranging from low- to high threshold interventions.<sup>15</sup> SCCM have shown to be effective in the prevention and intervention of anxiety and depression-related symptoms and have been used to systematically integrate and engage different mental health care workers at different stages of treatment,<sup>16,17</sup> insinuating its collaborative nature and capacity for differentiated support.<sup>16</sup> There are several guidelines and delivery versions of stepped care, with operational variations and defining features distinguishing their implementation.<sup>16,18,19</sup> To the best of our knowledge, stepped care models were not used in the mental health care of refugees and asylum seekers and little is known about their effectiveness with this specific population. However, since 2019, several studies have emerged that plan to implement this needs-based model in order to complement existing mental health care structures, such as Refukey<sup>20</sup> and BETTER CARE.<sup>21</sup> Within mental health, there are two common ways of implementing stepped care models: progressive and stratified approaches.<sup>18,19,22</sup> The progressive model focuses on initially assigning all patients to the lowest intensity intervention and then 'self-correcting' by stepping patients up.<sup>16,23</sup> Whereas, the stratified model places

patients in either lower or higher intensity interventions depending on assessment, including complexity of disorder and symptom severity.<sup>24</sup> It is also not uncommon to combine both models. In an evaluation of stratified and progressive care in four different mental health care sites, it appeared that each site had a slightly different interpretation to stepped care.<sup>19</sup> Our model strives to develop a culturally-adapted SCCM, filling an existing gap by addressing major barriers in the availability and delivery of tailored psychiatric treatments for refugees and asylum seekers.<sup>25,26</sup>

Therefore, the Mental Health in Refugees and Asylum Seekers (MEHIRA) study, a multi-centre, randomized, controlled trial intended to evaluate the effectiveness of a SCCM, in which interventions were allocated according to disease severity at four levels. Within this study, interventions were developed specifically for refugees with depressive symptoms of different severities. Based on available governmental data about the age range of refugees with a peak age between 14 and 25 years, we developed a study design with interventions specifically tailored to the needs of the population within this age range. i.e. in the transition between adolescence and adulthood. We hypothesize that participants in the active condition (SCCM) will show greater improvements in depressive scores compared to the control condition (TAU) from baseline to post-intervention. As a second hypothesis, we assume more cost-effectiveness of the SCCM compared with the cost-utility of the routine care practices (TAU) in Germany.

## Methods

### Design

A multicenter, clinician-blinded, randomised controlled trial was conducted between May 05/2018 and 03/2020, including seven university hospitals across Germany. Approval was obtained from the institutional ethics board at each site. All participants provided written informed consent. For participants <18 years of age, either the parents or legal guardians gave consent. Further details with respect to statistical analyses, data collection, and study procedures were conducted according to the original study protocol<sup>27</sup> and are described in more detail in the supplementary material.

### Participants and procedure

Trial population included male and female asylum seekers and refugees as defined by the United Nations High Commissioner for Refugees,<sup>8</sup> aged between 14-65 years, Arabic/Farsi native-speakers and/or fluent in English/German, with at least mild depressive symptoms measured by the self-rated Patient Health Questionnaires (PHQ-9<sup>28</sup>; PHQ-A for adolescents<sup>29</sup>) and relevant psychological distress assessed by the Refugee

Health Screener (RHS-15).<sup>30</sup> In the screening phase, participants first needed to display score of  $\geq 12$  for items 1 to 14 or  $\geq 5$  for item 15 at the RHS-15, and moreover at least a PHQ-9 score of at least 1 or higher on  $\geq 5$  items. The cut-off values for the RHS-15 are based on previous studies with refugees from Iraq, Nepal, Bhutan and Burma with  $\geq 14$  years, while the combination of these values showed high sensitivity (0.87) and specificity (0.79) to identify PTSD in refugees.<sup>28</sup> Moreover, we used the internationally well-established screening instrument PHQ-9 and its cut-offs scores. The PHQ-9 has been translated to more than 70 languages and provides evidence on measurement invariance in multi-ethnic populations<sup>31</sup> and thus, items were similarly used or function similarly in people from different ethnic backgrounds, including South-Asians, Africans, Turks, and Dutch.

Exclusion criteria were absent informed consent, diagnosis of a psychotic disorder assessed by the Mini-International Neuropsychiatric Interview (MINI),<sup>32</sup> a degenerative disorder evaluated by psychiatrist, and current risk of suicidality measured by the clinician-based Montgomery-Åsberg-Depression-Rating Scale (MADRS),<sup>33</sup> with  $\geq 4$  on item 10 assessed by a psychiatrist and/or psychologist. In cases of severe suicidality or other adverse events as defined by the study protocol, participants were excluded from the present study and admission to the inpatient units of the respective study center was arranged. In contrast to the initial trial protocol, the age range was decreased to 14 years before starting the study to support recruitment.

Participants were recruited through regionally heterogeneous allocation paths, including general practitioners, social workers, central clearing and outpatient clinics, refugee accommodations, language courses and religious institutions. Study teams presented the study, as well as the inclusion criteria, in a variety of lectures, workshops, as well as general information sessions and distributed flyers about the study in the mentioned locations to promote recruitment. However, irrespective of the heterogeneous allocation paths, all screenings were conducted by study personal of trained psychologists to ensure consistency either at the respective place or at each study center. Participants indicating relevant symptom burdens, as measured by the PHQ-9 and RHS-15 according to inclusion criteria, were further invited for a complete study inclusion and baseline assessment at each corresponding study center. Screening phase (T<sub>-1</sub>) was performed -4 weeks to 1-day prior to baseline assessment. Afterwards baseline assessment was performed at each study site respectively and participants were directly randomized displaying T<sub>0</sub>.

Randomization was assigned at the individual level in a 1:1 scheme with fixed block size of four ("Extended Stratified Block Without List - secuTrial"), stratified by center, according to a computer-generated electronic

Case Report File (eCRF) by an independent and external coordinating centre for clinical trials (Koordinierungszentrum für Klinische Studien - KKS), to receive either a SCCM intervention or treatment-as-usual. Study personnel had to enter the collected data to an online eCRF mask and received the allocation after inclusion inhibiting any prediction about the randomization process.

Treatment phase was initiated for a period of 12-weeks, directly resulting in the post-intervention assessment (T<sub>1</sub>). Participants were invited to the study sites for two further assessments after 24 weeks (T<sub>2</sub>) and 48 weeks (T<sub>3</sub>) for follow-up.

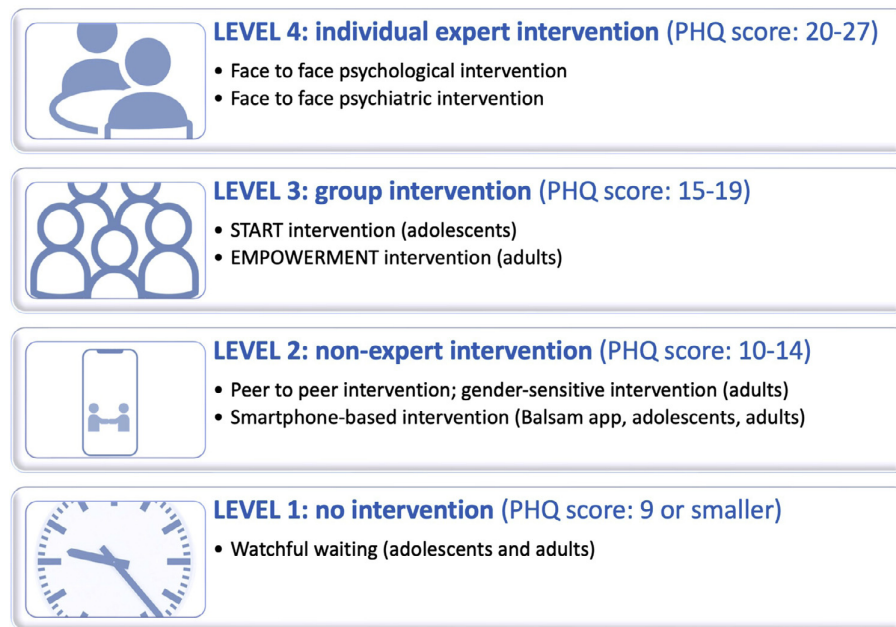
### Interventions

Within the SCCM condition, interventions were provided at four levels; participants were allocated to one of the four levels according to the PHQ-9 score at baseline (Figure 1). Composition of interventions differed for the adult and adolescent subgroups. Interventions for the adult subpopulation (age range 18 to 65) were provided by study sites in Munich, Aachen and two sites in Berlin. Interventions for the adolescent group (14 to 21 years) were provided by study sites in Marburg, Ulm, Tübingen, and Mannheim.

Interventions had a duration of 12 weeks for all levels, albeit with increasing treatment intensity and frequency by each level. After 12 weeks, symptoms were reassessed with the PHQ-9 and a second intervention phase was initiated according to the respective PHQ-9 at post-intervention in line with the procedure at baseline. Thus, participants could either be stepped up or down after the first treatment period depending on the initial inclusion criteria for PHQ-9 and RHS-15 (see participant and procedure). If a second treatment was not conducted, participants continue with the assessments leading to the follow-up assessments. All SCCM treatments were given alone and with no addition of any further practices.

Overall, in the first year of the project, the empowerment-, peer-to-peer- and smartphone-based interventions for levels 2 and 3 were developed by the research consortium through a participatory approach with members of the Middle Eastern refugee community (see study protocol for the in-depth elaboration of the development and methodological procedures<sup>27</sup>). A description of the SCCM and a summary of the content can be found in Table S6 in the supplementary material.

Participants assigned to level 1 received no intervention for the treatment period ("watchful waiting"). In level 2, a smartphone-based intervention was provided for adolescent and adult participants. The smartphone application (Balsam) contains 80+ videos and 15 modules covering topics, such as disease models, sleep hygiene, stigma, symptom manifestations, cultural belonging, acculturation, and cognitive-behavioural



**Figure 1.** Intervention pyramid of the Stepped Care and Collaborative Model (SCCM) for adults (upper part) and adolescents (lower part of figure)

interventions. Study personal supported the participants in downloading the application at baseline and gave an overview of the content and functions. As another option on level 2, participants received an in-person peer-to-peer group intervention. Members from the local refugee community were trained who had a background in teaching or medicine professions including teachers, nurses, educators and spoke either Arabic or/ and Farsi. These peers offered weekly psychosocial support and received weekly supervision by licensed psychotherapists at each study side. The peer-to-peer manual and intervention is group based with 6-10 participants and two peer trainers aimed to strengthen resources, address emotional needs, and improve coping skills by focusing on sharing experiences.<sup>15</sup>

At level 3, two separate in-person group-based interventions were offered by incensed psychotherapists either in fluent in Arabic or Farsi or in assistance of translators. Psychotherapists received regular supervision by the respective principal investigator at each study center. Adolescents participants received an adapted START intervention, a standardised and international well-validated brief therapeutic intervention, including elements of mindfulness, skill training and covering topics centred around stress regulation and resilience.<sup>34</sup> Adult participants received the Empowerment intervention,<sup>35</sup> which was developed to equip participants with the information and resources to cope with stressors and depressive symptoms. The manual

includes 16 culturally sensitive modules comprising cognitive and behavioural strategies (behavioural activation, stress management, emotion regulation) as well as specific topics such as homesickness and psychosomatic symptoms. Level 4 consisted of an in-person expert intervention in which participants either received pharmacological agents and/or psychotherapy given either by a licensed psychiatrist or psychotherapist on a weekly basis. Treatment providers received weekly supervision from the respective principal investigator within the mental care structures of the respective study center. When clinicians were not able to speak the participant's preferred language, a professional translator was provided.

In the control condition, participants were allowed to receive all social, psychotherapeutic, psychiatric, and further healthcare services within their region. Accordingly, participants were allowed for receive any kind of treatment without time, frequency, and intensity restriction within the German health care system which displays treatment-as-usual (TAU) in Germany. There were no binding regulations and stipulations regarding the respective treatments, -facilities, or -persons.

#### Public and patient involvement

The refugee population was involved in the MEHIRA study on four interrelated levels: they contributed (i)

	Mean ± SD; N/Total N (%)		P Value
	SCCM (n=294)	TAU (n=290)	
Age (years)	28.63 ± 10.79	28.63 ± 10.36	.99
Female	93/294 (31.63)	93/290 (32.31)	.91
Years of education	8.63 ± 4.03	8.83 ± 4.36	.59
Marital status			.42
Single	156/284 (54.93)	148/270 (54.81)	
Married	104/284 (36.62)	89/270 (32.96)	
Divorced	18/284 (6.34)	27/270 (10.00)	
Widowed	6/284 (2.11)	6/270 (2.22)	
Having children	113/283 (39.93)	106/268 (39.55)	.93
Past SES			.36
Upper class	19/271 (7.01)	26/262 (9.92)	
Upper middle class	44/271 (16.23)	53/262 (20.23)	
Middle class	152/271 (56.09)	129/262 (49.24)	
Lower middle class	33/271 (12.18)	36/262 (13.74)	
Lower class	23/271 (8.49)	18/262 (6.87)	
Current SES			.08
Upper class	1/271 (.37)	4/261 (1.53)	
Upper middle class	16/271 (5.90)	8/261 (3.07)	
Middle class	109/271 (40.22)	94/261 (36.02)	
Lower middle class	52/271 (19.19)	70/261 (26.82)	
Lower class	93/271 (34.32)	85/261 (32.57)	
Current employment			.64
Unemployed	216/269 (80.30)	219/263 (83.33)	
Protected employment	4/269 (1.49)	3/263 (1.14)	
Employee	47/269 (17.47)	41/263 (15.59)	
Military service/community	1/269 (.37)	0/263 (.00)	
Self-employed	1/269 (.37)	0/263 (.00)	
Reason for migration <sup>a</sup>			
War	167/291 (57.39)	158/277 (57.04)	.93
Natural disaster	2/291 (.69)	3/277 (1.08)	.61
Economic crisis	27/291 (9.28)	19/277 (6.86)	.29
Individual situation	49/291 (16.84)	42/277 (15.16)	.59
Political situation	102/291 (35.05)	109/277 (39.35)	.29
Social situation	61/291 (20.96)	59/277 (21.30)	.92
Other	33/291 (11.34)	24/277 (8.66)	.29
Time since arrival in Germany (in years)	3.04 ± 2.29	2.71 ± 4.25	.31
Primary Outcome PHQ-9, estimated marginal means from GLMM (mean ± standard error)			
PHQ-9 T <sub>0</sub> (Week 0)	15.87 ± 0.84	16.62 ± 0.81	.10
PHQ-9 T <sub>1</sub> (Week 12)	13.09 ± 0.88	14.41 ± 0.88	.04
PHQ-9 T <sub>2</sub> (Week 24)	12.80 ± 0.96	13.51 ± 0.94	.42
PHQ-9 T <sub>3</sub> (Week 48)	12.10 ± 1.30	13.05 ± 1.32	.54

**Table 1: Baseline Characteristics of the ITT sample.**

Abbreviations: SES socioeconomic status, PHQ-9 Patient Health Questionnaire, GLMM generalised linear mixed model.

<sup>a</sup> Multiple answers possible.

within the development procedure of the MEHIRA interventions as official and unofficial advisors, as well as focus group members; (ii) as graphic designers for the BALSAM app; (iii) as facilitators in the peer-to-peer-intervention; and (iv) within the study in the role of interns, translators, psychologists and research assistants.

### Outcomes

All assessments were conducted with validated and reliable tools for the specific population (PHQ-9, RHS-15, MADRS, MINI, and WHO-BREF) at baseline (T<sub>0</sub>), at 12, (T<sub>1</sub>), at 24 (T<sub>2</sub>) and 48 weeks (T<sub>3</sub>), using official translations in Arabic or Farsi, delivered by our study personnel. Moreover, demographic information was



	Mean $\pm$ SD; N/Total N (%)		P Value
	SCCM (n=144)	TAU (n=191)	
Age (years)	29.84 $\pm$ 10.93	28.92 $\pm$ 10.33	.43
Female	53/144 (36.81)	63/191 (32.98)	.47
Years of education	8.48 $\pm$ 4.12	8.23 $\pm$ 4.39	.60
Marital status			.46
Single	71/143 (49.65)	102/189 (53.97)	
Married	58/143 (40.56)	63/189 (33.33)	
Divorced	11/143 (7.69)	21/189 (11.11)	
Widowed	3/143 (2.10)	3/189 (1.59)	
Having children	62/143 (43.36)	75/190 (39.47)	.48
Past SES			.32
Upper class	5/137 (3.65)	12/185 (6.49)	
Upper middle class	22/137 (16.06)	36/185 (19.46)	
Middle class	80/137 (58.39)	96/185 (51.89)	
Lower middle class	15/137 (10.95)	28/185 (15.13)	
Lower class	15/137 (10.95)	13/185 (7.03)	
Current SES			.04
Upper class	1/138 (.73)	1/184 (.54)	
Upper middle class	11/138 (7.97)	4/184 (2.17)	
Middle class	57/138 (41.30)	69/184 (37.50)	
Lower middle class	26/138 (18.84)	55/184 (29.89)	
Lower class	43/138 (31.16)	55/184 (29.89)	
Current employment			.51
Unemployed	108/137 (78.83)	153/185 (82.70)	
Protected employment	3/137 (2.19)	2/185 (1.08)	
Employee	25/137 (18.25)	30/185 (16.22)	
Self-employed	1/137 (.73)	0/185 (.00)	
Reason for migration <sup>a</sup>			
War	86/144 (59.72)	118/191 (61.78)	.70
Natural disaster	1/144 (.69)	1/191 (0.52)	.84
Economic crisis	13/144 (9.03)	10/191 (5.24)	.17
Individual situation	19/144 (13.19)	27/191 (14.14)	.80
Political situation	50/144 (34.72)	73/191 (38.22)	.51
Social situation	31/144 (21.53)	37/191 (19.37)	.63
Other	14/144 (9.72)	19/191 (9.95)	.95
Primary Outcome PHQ-9, estimated marginal means from GLMM (mean $\pm$ standard error)			
PHQ-9 T <sub>0</sub> (Week 0)	14.31 $\pm$ 1.28	15.19 $\pm$ 1.27	.15
PHQ-9 T <sub>1</sub> (Week 12)	11.78 $\pm$ 1.31	13.52 $\pm$ 1.29	.01
PHQ-9 T <sub>2</sub> (Week 24)	11.48 $\pm$ 1.25	12.99 $\pm$ 1.14	.15
PHQ-9 T <sub>3</sub> (Week 48)	10.05 $\pm$ 1.69	12.11 $\pm$ 1.48	.25

**Table 2: Baseline characteristics of the PP sample.**  
Abbreviations: SES socioeconomic status, PHQ-9 Patient Health Questionnaire, GLMM generalised linear mixed model.  
<sup>a</sup> Multiple answers possible.

assessed at baseline which are displayed in [Table 1](#) and [Table 2](#). Here, participants were free to rate for example their socioeconomic status, without being asked about their income. In some cases, assessment procedures were conducted with the support of interpreters. Clinician-based assessments such as the MADRS or MINI were performed by a psychiatrist or psychologist blinded for the type of condition (TAU and SCCM) as well as specific SCCM intervention. Participants were

briefed about the purpose of blind-assessments. In the few cases of unblinding, we changed the assessor to ensure blinding throughout the trial.

The primary endpoint was the reduction of the self-rated PHQ-9 score from baseline (T<sub>0</sub>) to post-intervention (T<sub>1</sub>). Remission was defined as a reduction of PHQ-9 scores to  $\leq 8$  points, and response was defined as a reduction of PHQ-9 scores by  $\geq 50\%$ . A secondary endpoint was the reduction of the blinded clinician-based

MADRS score from baseline ( $T_0$ ) to post-intervention ( $T_1$ ) to examine depressive symptoms changes objectified by a clinician. Only results of the primary outcomes depressive symptoms (self-rated PHQ-9 and blind clinician-rated MADRS) as well as the cost-effectiveness outcomes are present in this article. All further assessed variables as depicted in the published study protocol<sup>27</sup> and preregistered at clinical trials (NCT03109028) and their outcomes will be published in future articles.

### Cost-effectiveness analyses

We performed a cost-effectiveness analysis alongside the trial. We estimated direct costs associated with the consumption of health care resources under routine conditions and costs of the intervention. We adopted the perspective of the health service providers for both kinds of costs.

We measured routine health service utilization in the sample of refugees and asylum seekers with an adapted version of the validated Mannheim Module Resource Use (MRU).<sup>36</sup> The MRU measured the frequency of resources consumed in the following areas: outpatient medical services, emergencies, mental health specialists, remedies and further outpatient therapies, and counselling or health support services. It also included hospitalization days and medication use. The recall period covered the last three months. We combined data on resource use with specific unit costs that were taken from nationally or regionally available data sources. All prices were calculated for the reference year 2019 in Euros and if necessary were indexed using the German consumer price index.<sup>37</sup> We extended resource uses to one year using follow-up measurements on resource use or last observation carried forward (LOCF) (further specification can be found in the appendix and Tables S1 and S2).

We calculated intervention costs of trial for each treatment step separately, because participants of the intervention had the chance to enter just one specific intervention type based on the individual baseline PHQ-value. We used a micro-costing approach to calculate the costs of each step by interviewing key persons of each intervention. In the structured interview, we collected data on running expenses due to consumables, personnel deployment and operating expenses (premises, equipment). To calculate costs of the intervention we used personnel wages based on gross hourly wages according to the tariff agreement of the federal states in Germany in 2019. We calculated per group and per patient costs using ITT-sample sizes of participants assigned to each step. In addition, we calculated costs per step or type of intervention based on an optimal scenario where all groups and applications had an expected capacity utilization of 100% in consideration of the rate of refugees with depressive symptoms entering

Germany in 2019. Hence, we calculated the average costs of [TERM] MEHIRA trial per patient by counting the proportions of participants in each intervention type either divided by the total number of the ITT-sample size (Base Case) or by the total number of theoretically assigned participants (Optimal Case). An in-depth description of this procedure and assigning of average costs of each step and intervention grouped by adolescents and adults is provided in the appendix and table S2. Finally, we combined resource use costs with implementation costs. For reasons of uncertainty and because we did not discount costs due to the short time horizon of the study, we created three alternative scenarios for the comparison of total costs in trial with resource use costs in TAU. We defined a base case (BC) and an optimal case (OC) as mentioned above. In addition, we defined an on-top case (IC), where intervention expenses were compared to zero costs of the TAU condition. The underlying assumption was that resource use patterns were equal between both groups after one year.

In the TAU condition, participants were allowed to receive all social, psychotherapeutic, psychiatric, and further healthcare services within their region. We did not assign any intervention costs to that group, but measured the consumption of (routinely) used health services at any time point.

The primary clinical outcome of the cost-effectiveness analysis is PHQ-9 value at follow up. We adjusted PHQ-9 values for age, gender, study site, and baseline value.

For the cost-utility analysis, the outcome was quality-adjusted life years (QALY). We calculated QALY for each measurement point using results from the self-rated WHO Quality of Life questionnaire, brief version (WHOQOL-BREF),<sup>38</sup> a 26-item questionnaire, where each item is rated on a five-point Likert scale. To obtain utility values we applied the conversion algorithm proposed by Salize & Kilian.<sup>36</sup> We extended calculated QALY from post-intervention to a 12 months period using additional QALY values from further follow-ups or last observation carried forward (LOCF) method. We corrected reported QALYs for age, gender, study site and initial value. Because the time horizon of the study was one year, we did not discount outcomes.

### Sample size calculation and statistical analyses of treatment effect

The a priori power analysis for primary outcome of depressive symptoms, taking site variation into account, occurrence yielded initially a planned sample size of 476 participants (238 per arm) for the analysis from  $T_0$  to  $T_3$ , with an anticipated dropout rate of 50% leading to an overall needed sample size of 952. We specified as the intention-to-treat (ITT) sample all randomised participants who provided baseline data on the primary outcome. Furthermore, we pre-specified as per-protocol (PP) sample all participants who took part in at least

50% of the provided intervention sessions (details: supplementary material). To enable a better interpretation of effect sizes for the primary analysis from  $T_0$  to  $T_1$ , we calculated a post-hoc power analysis based on observed effect size ( $f = .115$ ),  $\alpha = .05$ , and  $\beta = .80$ . Considering a correlation between repeated measures of .5, assuming a conventional  $2 \times 2$  repeated measures ANOVA yielded an overall sample size of 152 for the within between interaction effect. This effect size is comparable to priori interventions in refugee populations (2-4).

For primary and the first set of secondary analyses, repeated measure generalised linear mixed models (GLMM) were used to examine fixed effects of the time by randomisation groups (SCCM vs. TAU) from  $T_0$  to  $T_1$  (week 0 to week 12). For this model, we included time and time  $\times$  randomisation (treatment effect) as fixed effects and random effect to adjust for study centre (cluster). We ran this model for the primary outcome variable PHQ-9 score and the secondary outcome MADRS score, for both the ITT and PP sample, using data from  $T_0$  and  $T_1$  (12 weeks). For a comprehensive quantification of the analysed treatment effect, we report the difference (SCCM vs. TAU) of the PHQ-9 estimated means at  $T_1$  and the baseline-adjusted estimated mean difference at  $T_1$ . Additionally, we calculated Cohen's d by dividing the estimated marginal mean differences (SCCM vs. TAU at  $T_1$ ) by the pooled  $T_0$  SD. For a clinically relevant measure, we reported and compared remission rates ( $T_1$  PHQ-9 score  $\leq 8$ ) as well as response rates defined as a reduction of PHQ-9 scores by  $\geq 50\%$  and imputed missing values at  $T_1$  via LOCF for remission and response analyses. For follow-up analyses, we performed GLMM with both PHQ-9 and MADRS scores from the ITT as dependent variables, randomisation group (TAU vs. SCCM), and the interaction of randomisation group and time point as fixed effects, and centre as random effect for all available data from  $T_0$  to  $T_2$  (24 weeks), and  $T_0$  to  $T_3$  (48 weeks), respectively, and tested for differences in overall model fit between the models. Tests were 2-tailed and statistical significance was set at a P-value of less than 0.05.

#### Cost-effectiveness - statistical analyses

Statistical analyses were performed strictly according to the ITT principle. Missing data were imputed with the LOCF method, a conservative approach strengthening the null-hypotheses of equal costs and effects between SCCM and TAU. Because of highly right-skewed cost data, we applied generalized linear models (GLM) with gamma distribution and identity link function to estimate differences in health care costs between groups for all three scenarios. We performed a crude model containing randomization group as explanatory variable and an adjusted model containing randomization group, age, gender, study site, and baseline costs as explanatory variables.

We determined the incremental cost-effectiveness ratios (ICER), which we calculated as the ratio between the differences in mean costs, i.e. incremental costs ( $\Delta C$ ) and the differences in mean effects of depressive symptoms and QALY, i.e. incremental effects ( $\Delta E$ ). The ICER represents the additional costs to obtain one additional QALY or to decrease the PHQ-score by one point. To satisfy the condition of statistical uncertainty around the ICER, we performed non-parametric bootstrapping with 10,000 replications, which we plotted on cost-effectiveness planes. We calculated bootstrapped 95% confidence intervals (95%CI) around the ICER. Bootstrapped confidence limits are elusive when the denominator of the ICER approaches zero and in cases bootstrapped ICER spread all over the CE plane.<sup>4</sup> Therefore, and since certain thresholds ( $\lambda$ ) are usually unknown, we checked the likelihood of cost-effectiveness with an additional incremental net-monetary benefit (NMB) approach. The NMB approach is a function of  $\lambda$  and we considered different willingness to pay thresholds represented on the horizontal axis with the probability of cost-effectiveness on the vertical axis. The cost-effectiveness acceptability curve (CEAC) shows the probability that SCCM is cost-effective in comparison to TAU for a range of willingness to pay values. To satisfy the condition of parameter uncertainty, we performed all analyses with the three scenarios mentioned above (BC, OC, and IC). All analyses were performed using SPSS (SPSS Inc., Chicago, Illinois, USA) version 26, SAS statistical software (SAS Institute Inc., Cary, North Carolina, USA) version 9.4 and Excel 2016 for Windows.

## Results

### Sample and recruitment

Between April 2018 and December 2019, 584 participants were randomised in a 1:1 ratio, with 294 assigned to SCCM, and 290 to TAU. Recruitment varied across centres and the number of participants randomised to each centre is shown in Figure 2. ITT participants' characteristics in each study group at baseline are shown in Table 1. PP participants' characteristics in each study group at baseline are shown in supplementary material Tables S1 and S2. Based on the original sample size calculation we were able to recruit a little over 75% of the planned recruitment target.

### Effectiveness

**ITT analysis. Primary outcome.** For the ITT sample, primary outcome data were available for 294 participants in SCCM and 290 participants in TAU at  $T_0$ , and 174 in SCCM and 186 in TAU at  $T_1$ , respectively. There was a significant effect for time ( $T_0$  vs.  $T_1$ ) ( $F_{1,940}=39.51$ ,  $p < .001$ ). A time by group (SCCM vs. TAU;  $F_{2,940}=3.35$ ,

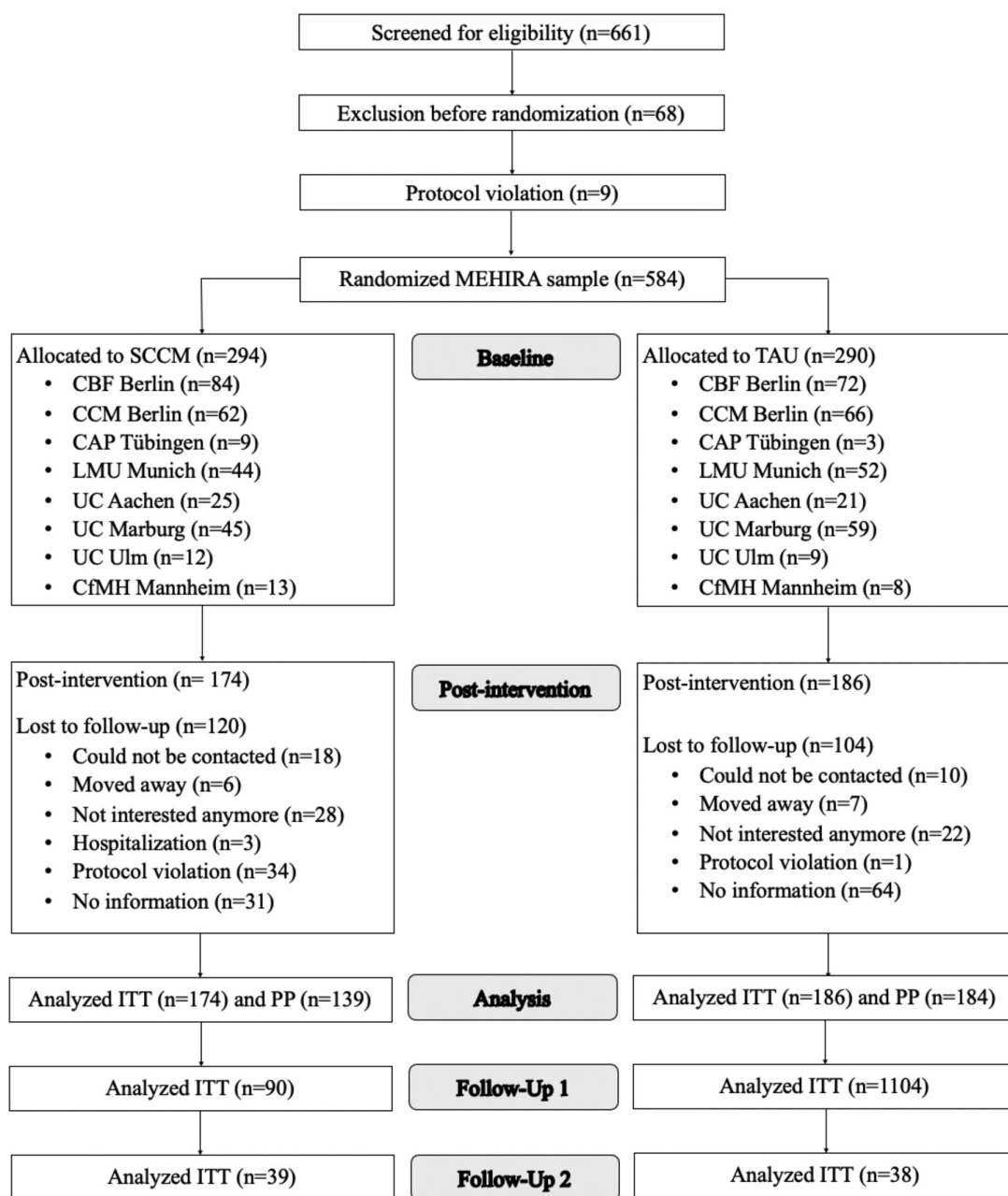
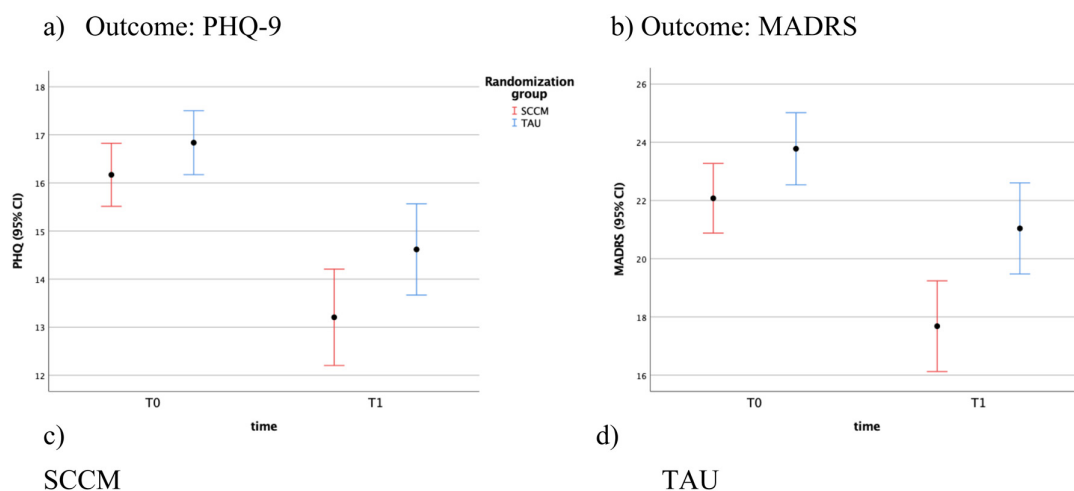


Figure 2. Flow chart of recruitment and randomization allocation

$p = .035$ ,  $d = .23$  in favour of SCCM) interaction significantly predicted PHQ-9 scores and characterises the main treatment effect. The intraclass correlation coefficient (ICC) across centres was .11, therefore 11% of PHQ-9 variance were explained by the study centre. PHQ-9 scores as a function of intervention group (SCCM vs. TAU) and time ( $T_0$  vs.  $T_1$ ) are shown in Figure 3a. Difference of PHQ-9 estimated means at  $T_1$

was 1.3 (95% CI=1.12 – 1.48,  $p < .005$ ) and baseline-adjusted PHQ-9 estimated mean difference at  $T_1$  was 0.57 (95% CI 0.40 to 0.74,  $p < .001$ ). Therefore, in the GLMM the  $T_0$ - $T_1$  decrease of PHQ-9 scores in SCCM was 0.57 higher compared to TAU.

Rate of remission (PHQ-9 score  $\leq 8$  at  $T_1$ ) in SCCM was 19% (95%CI: 14.7%-24%) and 12% (8.6%-16.4%) in TAU ( $p = .020$ ). Rate of response (PHQ reduction of



**Figure 3.** Scores on the PHQ-9 (primary outcome) and the MADRS scale (secondary outcome) as a function of randomization group (TAU vs. SCCM) and time (T0 vs. T1) for the ITT sample.

Note. Error bars represent 95% confidence intervals.

$\geq 50\%$ ) was 12.9% (9.3%-17.3%) in SCCM and 9.6% (6.5%-13.7%) in TAU ( $p = .212$ ).

**Secondary outcome.** MADRS data were available for the ITT sample for 273 participants in SCCM and 258 participants in TAU at T<sub>0</sub>, and 177 in SCCM and 189 in TAU at T<sub>1</sub>, respectively. For MADRS scores as the dependent variable, GLMM revealed a main effect for time (T<sub>0</sub> vs. T<sub>1</sub>;  $F_{1,893}=32.78$ ,  $p < .001$ ), together with significant time by randomization group (SCCM vs. TAU;  $F_{2,893}=4.77$ ,  $p = .009$ ) interaction. The ICC across centres was .29. MADRS scores as a function of intervention group (SCCM vs. TAU) and time (T<sub>0</sub> vs. T<sub>1</sub>) are shown in Figure 3b.

All ITT analyses stayed stable when repeated in the PP sample. As expected, we found a higher effect size ( $d=.30$  in favour of SCCM) and significantly higher response rates in SCCM (23.6%, 16.9%-31.4%) compared to TAU (14.1%, 9.5%-19.9%,  $p = .026$ ). See further details in Table S5.

**Follow-up analysis.** For the ITT sample, primary outcome data were available for 294 participants in SCCM and 290 participants in TAU group at T<sub>0</sub>, 174 in SCCM and 186 in TAU at T<sub>1</sub>, 90 in SCCM and 104 in TAU at T<sub>2</sub>, and 39 in SCCM and 38 in TAU at T<sub>3</sub>. Using GLMM from T<sub>0</sub> to T<sub>2</sub> with PHQ-9 scores as the dependent variable and a fixed effect for time (T<sub>0</sub> vs. T<sub>1</sub> vs. T<sub>2</sub>) and a time by randomisation group (SCCM vs. TAU) interaction, we found a main effect for time (T<sub>0</sub> vs. T<sub>1</sub> vs. T<sub>2</sub>;  $F_{2,1132}=30.88$ ,  $p < .001$ ), together with a marginal time by randomisation group (SCCM vs. TAU;  $F_{3,1132}=2.38$ ,  $p = .068$ ) interaction. Model fit, as indicated by the -2log likelihood criterion was 7228.27. Running the

same analysis from T<sub>0</sub> to T<sub>3</sub>, we found a main effect for time (T<sub>0</sub> vs. T<sub>1</sub> vs. T<sub>2</sub> vs. T<sub>3</sub>;  $F_{3,1207}=23.8154$ ,  $p < .001$ ) but no time by randomisation group (SCCM vs. TAU;  $F_{4,1207}=1.86$ ,  $p = .116$ ) interaction. As indicated by -2log likelihood criterion, model fit was 7735.63, indicating a poorer model fit in the more extended follow-up model. PHQ-9 scores over all time points are shown in Supplementary Figure S1.

### Cost-effectiveness

**Health care costs.** Resource use and cost data were available for 561 participants (SCCM=283 and TAU=278). One year after baseline, per capita resource use costs averaged €1,688.5 (SD=€571.3). Compared to TAU, per capita costs were significantly lower in SCCM (€-456.0, 95%CI=€-789.8 to €-122.2), due to significantly reduced inpatient and outpatient psychological or psychiatric treatment (Table S3).

Per capita BC intervention costs varied greatly between intervention types (Table S2). Overall, mean BC program costs for all 283 SCCM participants were €312.1 (SD=€57.5).

Total health care costs in SCCM were the sum of resource use costs and SCCM intervention costs. The fully adjusted GLM revealed no differences in total health care costs between SCCM and TAU after one year in BC (Table 3, Table S3). Additional results are provided in the supplementary material.

**Clinical outcome.** The intervention had a significant effect on depressive symptom scores displayed by adjusted mean differences in PHQ-values (Table S4). The ICER for BC was estimated at €-129.5 with

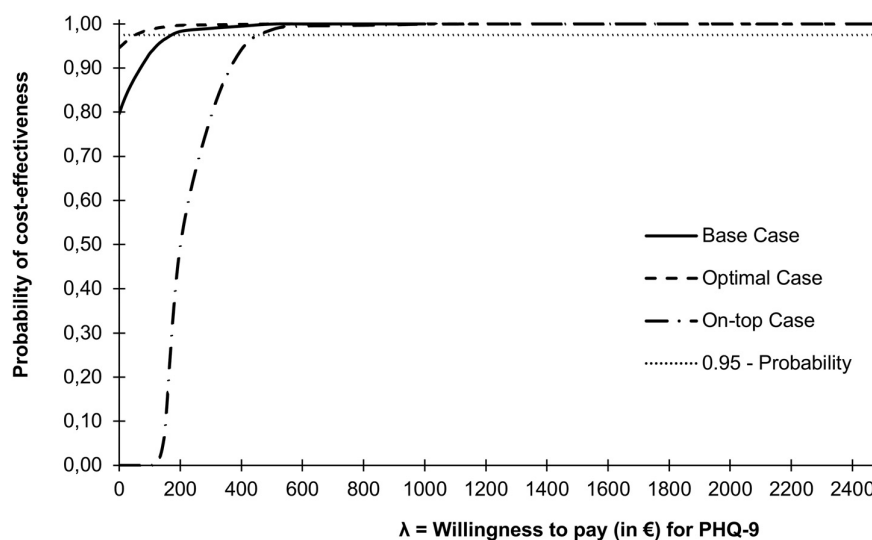
	Cost-effectiveness (PHQ)SCCM vs. TAU		Cost-effectiveness (QALY)SCCM vs. TAU	
	M (95%CI)	P	M (95%CI)	P
			Base Case	
Incremental Costs	-205.3 (-690.7 to 252.6)	0.44	-202.7 (-703.4 to 272.5)	0.44
Incremental Effect	1.59 (.85 to 2.32)	0.03	0.08 (-.01 to 0.18)	0.1
ICER (€/Effect)	-129.53 (-507.0 to 171.0)		-2,401.9 (-22,521.6 to 11,873.7)	
			Optimal Case	
Incremental Costs	-391.86 (-874.0 to 79.5)	0.07	-388.0 (-897.1 to 83.3)	0.07
Incremental Effect	1.59 (.83 to 2.32)	0.03	0.08 (-.01 to 0.18)	0.1
ICER (€/Effect)	-247.21 (-680.4 to 52.2)		-4,597.8 (-36,317.8 to 16,308.1)	
			On-Top Case	
Incremental Costs	315.1 (135.9 to 320.9)	<.001	315.1 (309.9 to 320.1)	<.001
Incremental Effect	1.59 (.84 to 2.32)	0.03	0.08 (-.01 to 0.18)	0.1
ICER (€/Effect)	199.31 (135.9 to 374.9)		3,733.7 (-16,284.5 to 28,005.7)	

**Table 3: Adjusted Results of GLM Analyses for incremental costs and effects (PHQ and QALY) of SCCM scenarios compared to TAU and calculated ICER with bootstrapped confidence limits.**

Notes: n= 382 participants were included in cost-effectiveness for clinical effects (PHQ) and n= 529 participants were included in cost-effectiveness for patient reported outcome (QALY). GLM adjusted for age, gender, study site and resource use costs at baseline. GLM = Generalized Linear Model, PHQ = Patient Health Questionnaire, QALY = Quality Adjusted Life Year, ICER = Incremental Cost-Effectiveness Ratio, SCCM = Stepped and Collaborative Care Model, TAU = Treatment as Usual.

bootstrapped 95%CI of €-507.0 to €171.0. We found that 80% of the bootstrapped ICER were located in the southeast quadrant of the CE plane (Table S4 and Figure S2). This quadrant is associated with greater

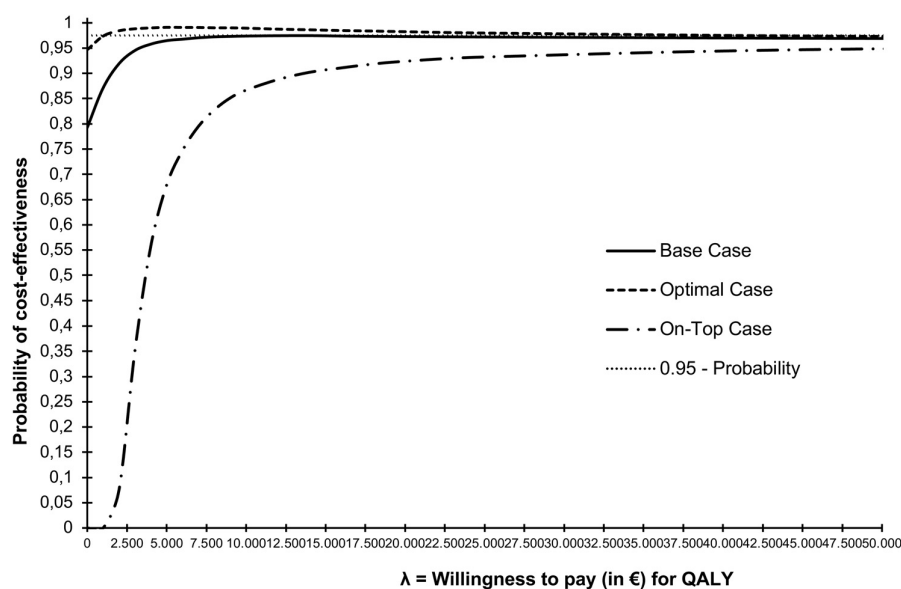
effects and lower costs of SCCM in relation to TAU. Thus, SCCM showed greater cost-effectiveness than the TAU condition. Figure 4 showed that the incremental CEAC for BC intersects the Y-axis at at 0.8. That means



**Figure 4.** Net-Monetary Benefit - cost-effectiveness acceptability curves for all scenarios of SCCM vs TAU on PHQ.

Note. Probability that SCCM intervention is acceptable (values on the vertical axis) in relation to TAU on the willingness to pay for a reduction of PHQ values by one point, given varying thresholds for willingness to pay (horizontal axis) based on 10,000 bootstrapped ICER replications. The small dotted line (0.95 – probability) indicates the upper 95%CI, i.e. the maximum amount that has to be invested to be confident that SCCM is cost-effective. Intersections of CEAC with the confidence line represents cost-effectiveness for a specific scenario. Thus, these  $\lambda$  were €171 for Base Case, €52 for Optimal Case, and €375 for On-top Case (representing cost of intervention only), respectively.

SCCM=Stepped and Collaborative Care, TAU=Treatment as Usual, PHQ=Patient Health Questionnaire, CEAC=Cost-Effectiveness Acceptability Curve.



**Figure 5.** Net-Monetary Benefit - cost-effectiveness acceptability curves for all scenarios of SCCM vs TAU concerning QALY.

*Note.* Probability that SCCM intervention is acceptable (values on the vertical axis) in relation to TAU on the willingness to pay for an additional quality adjusted life year, given varying thresholds for willingness to pay (horizontal axis) based on 10,000 bootstrapped ICER replications. The small dotted line (0.95 – probability) indicates the upper 95%CI, i.e. the maximum amount that has to be invested to be confident that SCCM is cost-effective. Intersections of CEAC with the confidence line represents cost-effectiveness for a specific scenario. These  $\lambda$  were €11,874 and €20,000 for Base Case, and €1,100 and €30,000 for Optimal Case. CEAC for the On-top Case (representing cost of intervention only) asymptotically approximates the upper 95%CI, the higher the chosen WTP, but did not intersect the confidence line.

SCCM=Stepped and Collaborative Care, TAU=Treatment as Usual, QALY=Quality Adjusted Life Years, CEAC=Cost-Effectiveness Acceptability Curve.

that SCCM obtained an additional effect without any additional costs. Using different willingness to pay thresholds for BC, we found that the incremental CEAC intersects the upper confidence limit of 97.5% at €171, i.e. the maximum amount that had to be invested to make sure that SCCM is cost effective in relation to TAU (Figure 4). The robustness of BC results was confirmed with calculated ICER and incremental NMB for OC and IC (Figure 1 and Table S4). In-depth descriptions are provided in the supplementary material.

*Utility.* Average QALY of the SCCM conditions were slightly but insignificantly higher than average QALY of the TAU condition after one year; .501 (SD=.178) in SCCM and .480 (SD=.161) in TAU (Table S4). The ICER resulted in €-2,401.9 with large bootstrapped 95% CI ranging from €-22,521.6 to €11,873.7 (Table S4). The majority of bootstrapped ICER of BC were located in the southeast quadrant (76.2%) (Figure S3). This quadrant is associated with greater effects and lower costs of SCCM in relation to TAU. The CEAC of BC intersected the vertical axis at 0.8 in Figure 5. That means that SCCM probably obtained an additional QALY without any additional costs in relation to TAU. The CEAC of SCCM intersected the upper confidence

interval twice at WTP values of €11,874 and €20,000. After the second intersection and thus, at WTP-values larger than €20,000, a prolonged decrease of the CEAC was observed with an asymptotic approximation to an imagined probability-line of 96% (Table S5). Hence, a maximum amount of €11,874 had to be invested to make sure that SCCM is cost-effective, but at amounts larger than €20,000 this assurance slowly decreased. We changed parameters with OC and IC, whereby the CEAC of OC revealed a similar pattern at different WTP values and the CEAC for the IC did not intersect the 97.5% confidence limit but asymptotically approximated an imaginary 96% probability line (Figure 5). In-depth descriptions are provided in the supplementary material.

## Discussion

We found that patients treated within a Stepped and Collaborative Care Model (SCCM) showed a larger reduction of depressive symptoms and superior cost-effectiveness compared with TAU. Outcomes were mainly driven by effects of interventions provided for more severely affected participants, although a

reduction in depressive scores was also present in the TAU condition. Our study is in line with previous studies,<sup>16,17</sup> providing evidence for an intervention model that can strengthen healthcare systems and address challenges, such as scarcity of resources, shortage of staff and specialized expertise. A key strength of the present study lies in its representative sample involving several German study sites with unique clinical characteristics being examined at different time points in a randomized controlled trial. Another major strength lies in the development of five diverse and culturally sensitive digital, group and community-based interventions.

As a consequence of large migration movements, mental health institutions in Europe have faced vast challenges and burdens to their health care systems.<sup>5</sup> Against this background, the present model was developed as an approach to support refugees who face psychological distress.<sup>12,27</sup> SCCM was tailored to simultaneously overcome several obstacles by offering a set of culturally-sensitive psychological interventions. Although conflict exposure can result in a wide range of psychiatric disorders (depression, PTSD, anxiety and psychosis),<sup>39</sup> we followed a diagnostic approach in our study focusing on depressive symptoms, which are highly prevalent among refugee groups in Germany.<sup>12</sup>

While Germany's mental health care system is relatively robust and well-organized, it still has shortcomings, such as an ineffective allocation of existing psychotherapeutic resources, fragmentation and lack of coordinated care, and a scarcity of available flexible and integrative treatment models.<sup>40,41</sup> This became particularly evident in recent years, where the health care system was additionally challenged by a vast number of incoming asylum seekers and refugees. Therefore, our model might provide one possible approach and evidence on how to address challenges in situations where increased numbers of migrants are relocated, such as in the case of the Syrian civil war or the Ukrainian war. In agreement with our findings, previous stepped care studies demonstrated to save resources and to be clinically and cost-effective when compared with standard care.<sup>16,42,43</sup> As a part of England's Improving Access to Psychological Therapies (IAPT)<sup>42</sup> initiative, SCCM have also been incorporated with the goal of evaluating its organizational potential as an evidence-based promising approach that can improve and expand on the quality and access to available mental health care services. So far, preliminary investigations have demonstrated an improved use of available resources and increased recovery rates. Our SCCM was clinically effective at a lower cost and so we suggest that our model might be explored not only in settings with other ethnic minorities in high income countries, but also in low-and-middle-income-countries (LAMICs). Adaptations as indicated in already existing evidence (MANAS in India,<sup>44</sup> STEPCARE in Nigeria<sup>42</sup>)

might be necessary since health systems in LAMICs are likely to be different to those in academic settings in Germany.

There are potential indicators that clinical efficacy of the SCCM might be driven by either pharmacological and psychotherapeutic interventions that were offered by trained clinicians (psychiatrists and psychologists) at intervention levels 3 and 4. In a meta-analysis by Khan et al. (2010), including 45 trials, patients with higher depressive scores at baseline who were treated with antidepressants, showed greater improvements, compared with participants with lower initial symptom severity.<sup>45</sup> These findings suggest that interventions tailored to the needs of more severely depressed participants are more likely to be more effective than those for less severely ill. This is of importance since the effectiveness of regularly used internet-based CBT (often used in patients with less severe depression) has been demonstrated to be both clinically and cost effective<sup>43</sup> and a means to overcome stigma and language barriers.<sup>45</sup> Especially since web-based and community-based interventions have been reported to be less stigmatizing for individuals seeking psychiatric care,<sup>49</sup> making treatments more accessible. Future research (with sufficiently powered samples) is necessary to assess further beneficial dimensions besides ameliorating depressive symptoms, such as effects in reducing stigma around mental health treatment or increasing social support. before group interventions in SCCM could be filled and initiated.

Participants were initially assessed for symptom severity and their placement within the stepped model followed a more stratified stepped care approach, with only some participants being stepped up occasionally, depending on the availability of resources and time. There are several factors that play a role in the limited number of patients who were stepped up in this study. As other studies have already indicated,<sup>16,18,19</sup> several operational and organizational complications can arise in the implementation of stepped care models. Some of them included group interventions taking a long time to be filled up, participant motivation to continue in the study, dropouts due to the nature of this mobile population, difficulty reaching participants and time constraints due to a longer recruitment phase. Our results, thus, confirm the operational complexity in the service delivery of this model and shed light on the reality of how organizational pathways can influence the performance of stepped care systems, often leading to an alteration of initial plans. For this reason, a replication of the results including a larger sample size, more resources and a longer treatment period for interventions would be beneficial to confidently solidify the study outcomes.

The number of dropouts and the heterogeneity of dropout rates across all sites reflect a limitation of the present study. Building upon our findings, future research should consider reasons for dropout and ways



in which drop out and response rates can be improved in order to achieve better research outcomes. To account for differential effects, a PP analysis was conducted (see supplement), reflecting a reasonable sensitivity analysis that clearly indicates that, adjusting for site as a random effect in our models, treatment effects remain stable when considering dropouts. Given those different regions in Germany offered refugee placements at different times during the migration process in 2015 and onward, we also tested whether time since arrival in Germany (see [Table 1](#)) differed between sites, which was not the case ( $p = .55$ ), however future research should consider range of time since arrival and its specific effects on intervention success. Further limitations are regional differences in health care between study sites, which may have led to considerable variability in recruitment, assessment, and intervention levels. Recruitment across all study sites was reported to be challenging due to several factors, i.e. mental health stigma, regional differences in health care provision and an uneven spread of refugee communities across Germany, leading to an oversampling of refugees in the larger cities. Furthermore, setting up a new SCCM will likely cause temporary disruptions in already existing workflows. Although this data was not systematically collected in the trial, we believe that it would be useful to gather information regarding organizational complexities and any noteworthy challenges related to the delivery of services in future implementations of similar projects. Nonetheless, since treatment gaps are not as pronounced in the German health care system compared with other regions, we expect that the model needs to be adapted if used in other international and humanitarian-aid setting. We initially planned and documented in our published study protocol to conduct a cluster-randomization, however as we could only conduct the intervention levels at two different sites inhibiting a cluster randomization. Finally, interpretations with respect to efficacy on the level of interventions or treatment steps can only be made very cautiously since the study was not sufficiently powered to address this issue.

In conclusion, the proposed SCCM intervention demonstrates clinical efficacy in reducing depressive syndromes in a sample of adult and adolescent refugees. Our study provides evidence for higher cost-effectiveness of the overall model. Further directions should investigate the effectiveness of SCCM's for other prevalent diseases, medical settings, and cultural contexts. Another promising context is the provision of the stepped care model in form of a digital stepped care model, i.e. a model in which most of the interventions are provided digitally. It can be assumed -albeit evidence is lacking- that this form of SCCM may increase resource efficacy. Our findings contribute to the development of models that can improve clinical productivity, decrease disease burden, and include marginalized communities.

### Contributors

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 Malek Bajbouj: design, funding acquisition, investigation, development of intervention, project supervision, original paper draft outline, review and editing throughout.

#### Declaration of interests

Dr. Banaschewski served in an advisory or consultancy role for Lundbeck, Medice, Neurim Pharmaceuticals, Oberberg GmbH, Takeda, and Infectopharm. He received conference support or speaker's fee from Lilly, Medice, and Takeda. He received royalties from Hogrefe, Kohlhammer, CIP Medien, Oxford University Press; the present work is unrelated to these relationships. Alkomiet Hasan has been invited to scientific meetings by Lundbeck, Janssen, and Pfizer, and he received paid speakerships from Desitin, Janssen, Otsuka, and Lundbeck. He was a member of Roche, Otsuka, Lundbeck, and Janssen advisory boards. Paul Plener was involved in clinical trials of Lundbeck and Servier. He received a speaker's honorarium from Shire and Infectopharm. Frank Padberg is a member of the European Scientific Advisory Board of Brainsway Inc., Jerusalem, Israel, and has received speaker's honoraria from Mag&More GmbH and the neuroCare Group. His lab has received support with equipment from neuroConn GmbH, Ilmenau, Germany, and Mag&More GmbH and Brainsway Inc., Jerusalem, Israel. The other authors declare no competing interests.

#### Data sharing statement

The trial data can be requested deidentified and anonymised by researchers for future usage in independent scientific research projects. These requests should be addressed to the corresponding author to negotiate a data-sharing agreement with the Charité – Universitätsmedizin Berlin.

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#### Supplementary materials

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### 3. Discussion

The present habilitation project relies on five original research studies by our research group – Global Mental Health – at the Charité – Universitätsmedizin Berlin conducted in Germany, Iraq, and Jordan, intending to examine the multi-layered levels of mental health of Arabic- and Farsi-speaking refugees and asylum seekers. In the following pages, the *five* studies will be sequentially presented in terms of their results and discussed concerning their novelty and importance for the field, as well as possible implications, recommendations, and limitations. To the best of our knowledge, all present studies assess and examine such dimensions for the first time in either the respective country (Jordan, Iraq, Germany) or study population (Arabic- and Farsi-speaking refugees, asylum seekers, Kurdish host community, internally displaced people) highlighting its uniqueness and originality.

In our *first* study, we assessed, on an exploratory basis, the preferences and expectations of internally displaced- (IDP) and Syrian refugees, as well as the Kurdish host community in the Kurdish Region of Iraq (KRI) (Böge et al., 2022). In line with a similar study by our research group conducted in Jordan (Karnouk et al., 2019), participants showed high satisfaction rates with provided services and expressed perceived benefits of psychotherapeutic interventions. In contrast to these findings, previous research from Iraq indicates hesitancy in engaging in psychiatric and psychological treatment from patients, especially women and their families (Bolton, 2013). With ongoing conflicts in the Middle East and North Africa (MENA) region leading to increased rates of distress in vast parts of society, the need and demand for psychiatric and psychological health care may have gained relevance in the past decade, specifically considering the severity of political instability and the devastation caused by war and displacement (Abi-Rached, 2021; El-Khoury et al., 2021). In the light of growing public, structural, and organizational efforts leading to partially improved availability, access, and quality of overall mental health services, another possible explanation may be the actively induced attitude changes in the lay public. Nevertheless, participants remained to be ambivalent concerning perceived stigma and bias towards the therapist, which displays crucial factors of the perceived public- and personal stigma in the overall help-seeking process (Pedersen & Paves, 2014).

Our results regarding the influence of perceived stigma on help-seeking behavior are congruent with recent research from Arab regions (Bawadi et al., 2022; Charara et al., 2017; Okasha et al., 2012). This highlights the vital role of cultural shame, social exclusion, lack of social support, as well as family and patient resistance to mental illness diagnoses exhibiting numerous barriers to adequate mental health care. Until today, culturally embedded fears pertaining to a loss of societal face and adverse effects on marriage prospects continue to surround the topic of mental illnesses. Mental illnesses are widely perceived as personal weaknesses, which hamper help-seeking attitudes and discourage self-disclosure outside the family (Awad et al., 2013; Bawadi et al., 2022; Heath et al., 2016; Sadik et al., 2011; Sadik et al., 2010). In this regard, outcomes related to the therapist's characteristics, specifically on items about their gender and political opinions, are in agreement with previous research from Jordan (Karnouk et al., 2019). Consequently, our study shed light on an under-researched field of complex cultural influences that impact the preferences, perceptions, and attitudes towards psychotherapy in heterogenous Arabic-speaking communities. These findings pave the way to design adaptive psychological treatment pathways according to the needs of these communities. They can further guide psychosocial counselors in these settings and regions to tackle culturally related barriers to help-seeking.

In the *second* study, we then examined the role of and association between perceived stress and perceived social support on symptoms of anxiety, depression, and PTSD in Syrian refugees located among the two largest host countries in the world, namely Jordan and Germany (Böge, Karnouk, Hahn, Demir, et al., 2020). Our main findings showed that perceived stress had a significant negative effect on all of these three clinically most prevalent symptom dimensions in refugees, regardless of the place they are residing. Furthermore, study results revealed a positive effect of perceived social support on depressive- and PTSD symptoms in Germany. Finally, it was also found that for participants in Germany, 'significant others' showed to be an essential social support factor, while 'family' seemed to be more important to the Jordan cohort - both having a positive influence on symptoms of PTSD.

These outcomes need to be discussed in the light of the specific country of settlement as well as of the characteristics of the people fleeing to either Jordan or Germany. In light of official census data, roughly 69,2% of asylum seekers in

Germany are males, predominately single and with higher levels of education (Juran & Broer, 2017). These estimates are harmonious with the demographic characteristics of our subsample in Germany, displaying high ecological validity. In Germany, the open-door policy led to fast and efficient political and legislative decisions and measures, giving refugees faster access to health care, language courses, and the labor market, fostering the integration process (Degler & Liebig, 2017). These personal and professional development opportunities in high-income countries, such as Germany, stand in contrast to various barriers in Jordan, a country with limited resources and capacities. With proximity as well as cultural, societal, and political similarities to the country of origin, young male refugees took the risky endeavor to resettle in European countries.

In contrast, predominately female and older refugees remained in more familiar territories. Considering the heterogeneity of sociodemographic variables of both refugee populations, direct methodologically sound comparisons remain scientifically complex; however, these sociodemographic differences indicate high ecological validity displaying the current situation with its challenges but also individuals' unique needs for adequate social support structures. Therefore, our outcomes make sense as participants residing in Germany primarily rely on 'significant others' for social support' with their absent families. However, refugees in Amman seem to experience a positive influence of 'family' on PTSD symptoms as strong familial relationships and social fabrics remain upright (Hassan et al., 2016). Hence, family separation and reunion can be a crucial factor in Germany's political decision-making, considering their vital influence on individuals' mental health (Rousseau et al., 2001; Spaas et al., 2022).

Nevertheless, like with most cross-sectional studies, these results need to be interpreted cautiously and conclusions on causality should not be drawn carelessly. Still, the results are novel and offer a first insight into the comparative understanding and vital roles of stress as well as the respective social support system in RAS. Accordingly, this study demonstrates that levels of perceived stress appear to be equal among refugees in different host countries – in this case, Germany and Jordan – while the types and influence of social support factors on mental health of refugees are distinct. This, in turn, provides a fruitful ground for policymakers to develop and implement tailored interventions to enhance social care and support structures in their respective countries.

In the *third* study, we explored the representation of somatic and psychological depressive symptoms as well as the possible influence of internalized stigma on these outcomes in Arabic-speaking refugee outpatients in Germany. In summary, the main results revealed moderate levels of somatic and psychological depressive symptoms in refugees. Overall, expressed levels of stigma were low and showed no direct association with somatic symptoms, however, with psychological symptoms of depression. Further analyses indicated five independent symptom clusters, including symptoms of sadness, pain-induced fatigue, head-body-related symptoms, indigestion, and male sleep problems (Lindheimer et al., 2020).

The high prevalence regarding the most commonly reported symptoms of impaired mental health, namely sleeping difficulties and energy loss, are consistent with the findings of our *second* study (Böge, Karnouk, Hahn, Demir, et al., 2020), but also with research with traumatized refugees, where 99% reported sleeping problems and nightmares depicting core features of PTSD and partially of depression (Sandahl et al., 2017). An in-depth analysis of items revealed that the most frequent somatic symptoms assessed by the PHQ-15 were “feeling tired or having low energy” and “trouble disturbances,” while participants named “feeling down, depressed, or hopeless”, “feeling tired or having little energy”, and “trouble falling or staying asleep, or sleeping too much” as most prevalent psychological symptoms measured by the PHQ-9. Moreover, we found significant moderate correlations between psychological and somatic symptoms. As these symptom domains are highly intertwined and overlapping, it underlines the clinical relevance and need to assess these symptom dimensions in RAS. Even after excluding these overlapping items the correlation between both scales displayed significance, unveiling the role of somatic symptom representation as a part of psychological distress in RAS (al-Krenawi & Graham, 2000; Lanzara et al., 2018; Rohlf et al., 2014; Zbidat et al., 2020). Hence, it can be shown that Arabic-speaking refugees suffer from substantial psychological burden coupled with physical distress, which is in accordance with findings in Asian populations in which participants stated psychological as well as somatic distress (Lee et al., 2015). Henceforth our outcomes add empirical evidence to the cross-cultural relevance of somatization and psychological burden and challenge a still prevalent Western mind-body

dualism in psychology and psychiatry as somatic distress does not exclude the concurrent experience of psychological symptoms (Ryder et al., 2008; So, 2008).

Our study shows further that stigma was relatively low in our sample, which is in line with results from study *one* (Böge et al., 2022) as well as a recent study using representative panel data from refugees living in Germany by our research group (Walther, Fuchs, et al., 2020). Moreover, we found no association between internalized stigma and somatic-, however, with the severity of depressive symptoms. While, on the one hand, numerous studies have found similar results demonstrating the association between stigma and psychological outcomes (Heredia Montesinos et al., 2012; Kira et al., 2015; Kulesza et al., 2014; Pyne et al., 2004), these findings were on the other hand primarily based on cross-sectional designs hampering conclusions about causality. Outcomes concerning the influence of stigma on somatic symptoms contradicted our initial hypothesis but are in line with cross-cultural evidence (Heredia Montesinos et al., 2012; Raguram et al., 1996) challenging the somatization hypothesis, which postulates that depression is purely expressed by somatic symptoms due to concerns about stigmatizing attitudes. Altogether, our findings suggest that somatic and psychological distress are prevalent in a variety of cultural contexts, that psychological burden is not primarily expressed by somatic symptom representation and that stigma is associated with psychological outcomes.

Still, more research is needed in this field to address our outcomes and present design limitations, considering experimental and interventional designs to lower stigma and assess potential positive effects on overall psychological symptom burden. Another reason for the overall lower levels of stigma in our sample could be attributed either to sampling bias but also to the latest advances in awareness campaigns and increasing psychosocial options in the MENA region (Karnouk et al., 2019), as well as in host countries that seem to slowly bear their fruits (Abbott, 2016). However, to address the shortcomings of the present study, future research should include more heterogeneous recruitment pathways and diverse patient populations, as the participants in our study were all help-seeking, limiting the generalizability of outcomes.

Furthermore, on an exploratory basis, we detected five symptom clusters that appear to be in bidirectional association between culturally and linguistically formed, expressed and understood explanatory models of mental disorders in



Arabic-speaking refugees (Hassan et al., 2016). Since various structural, organizational, and linguistic barriers for refugees seeking adequate mental health care in Germany persist, understanding the specific representations and expressions of psychological and somatic symptom dimensions in Arabic-speaking refugees is crucial. Based on these results, health authorities, clinicians, and nurses and social workers on the ground can be informed to improve screening procedures and assessments of mental disorders by including psychological and somatic assessment tools to facilitate tailored treatments for the largest refugee population in Germany. Nevertheless, future research should broaden our preliminary understanding concerning the conceptualizations of mental disorders in the Arabic language and culture by assessing these dimensions in other refugee groups and different settings. This might shed light on other mediation effects and whether outcomes are unique to Arabs, RAS or expandable to further populations.

Our *fourth* study aimed to characterize and examine the relationship between early-life stress, cognitive emotion regulation, and symptoms of depression, anxiety, and PTSD in a sample of Syrian refugees. First, we were able to show that early life stress was positively correlated with maladaptive cognitive, emotional regulation (MCER), PTSD, depression, as well as anxiety and that MCER was positively correlated with anxiety, depression, and PTSD as well. Based on a mediation model, we could determine that MCER significantly mediates the effect of early life stress on symptoms of depression, anxiety, and PTSD (Demir et al., 2020).

In line with previous research on early life stress and emotional regulation (Compas et al., 2017; Kim & Cicchetti, 2010), our outcomes underscore the importance of MCER as a central psychological mechanism affecting the pathway between early life stress and a variety of psychological symptoms dimensions for the first time in Syrian refugees. Subsequently, maladaptive appraisal, which developed primarily due to early life stress, could foster vulnerabilities in affected individuals and make them prone to a broad range of mental health symptoms throughout their life span (Krause et al., 2003; Reddy et al., 2006). Additional evidence comes from Hopfinger et al. (2016), demonstrating in a clinical sample that deficits in emotion regulation not only mediated the relationship between childhood trauma and depression severity, but also between childhood trauma and persistent lifetime depression.

Moreover, we found that MCER fully mediated the association between early-life stress and anxiety symptoms. A study from South Korea showed similar patterns, which raises the question of whether specific emotional regulation strategies relate to certain psychopathologies (Huh et al., 2017). While current research indicates that individuals with anxiety rather suppress emotions, people with depression more frequently tend to ruminate. Therefore, it is of particular interest that future research identifies and assesses concrete emotion regulation strategies for certain representations of psychiatric symptoms (D'Avanzato et al., 2013). This approach could pave the way for more personalized and transdiagnostic prevention and intervention programs targeting explicit psychological processes and mechanisms of change. Notably, we did not find any significant interaction effect of war exposure on the association between psychopathology with early life stress. Henceforth, it seems that based on our research in Syrian refugees, early life stress and later life trauma experiences independently affect the development of psychiatric symptoms. These findings are similar to research conducted with military veterans highlighting that war exposure, early life stress, and PTSD in adults independently predict changes in amygdala and hippocampus connectivity changes (Birn et al., 2014).

Therefore, further longitudinal investigations assessing stress sensitization in terms of occurrence and duration in different populations might give further insights into underlying mechanisms. On another level, this study points to the need for early intervention measures to prevent the development of potential psychological vulnerabilities in RAS. This may be of particular importance for younger refugees who have been exposed to traumatic experiences in their childhood in the home country, during the flight, as well as in the country of refuge, in which early life stress could have substantial consequences in the long term. Our study stresses the need to assess early life stress in RAS as an important dimension and create culturally sensitive interventions to target a general core psychological process, namely cognitive-emotional regulation, to ameliorate a broad range of symptoms experienced in Syrian refugees affecting their mental health.

In the last and *fifth* study, we first developed a novel and culturally sensitive Stepped Care and Collaborative Model (SCCM) within a large multicenter randomized controlled trial (RCT) encompassing eight university hospitals in

Germany (Böge, Karnouk, Hahn, Schneider, et al., 2020). In a second step, we assessed the effectiveness and cost-effectiveness of the SCCM compared with treatment-as-usual in Germany's health care system on the primary outcome of depressive symptoms in adolescent and adult Arabic and Farsi speaking RAS aged between 14-65 years. By primarily focusing on depressive symptoms, we addressed, on the one hand, shortcomings of previous trials in RAS (Kip et al., 2020; Nose et al., 2017; Turrini et al., 2019; Turrini et al., 2021; Uphoff et al., 2020), while on the other hand focusing on the symptoms with the highest prevalence among RAS in Germany (Hoell et al., 2021).

We found that participants in the SCCM who received tailored novel, culturally sensitive psychological interventions in the form of a smartphone-based application, peer-to-peer-, group-, or individual therapy or pharmacological interventions according to their symptom severity at baseline experienced significantly higher improvements in depressive symptoms compared to participants receiving TAU. Furthermore, our SCCM showed superiority over TAU in terms of cost-effectiveness (Böge et al., 2022). To the best of our knowledge, this study represents worldwide the largest psychological intervention trial with a representative and large adolescent and adult RAS sample of 584 participants in this field encompassing eight heterogeneous German university sites. While our discoveries are in line with recent research on SCCM in other populations that underscore SCCM's effectiveness as well as cost-effectiveness (Harter et al., 2018; Ho et al., 2016), they provide the first evidence for such a novel psychological intervention model for Arabic- and Farsi-speaking RAS. These insights can strengthen health care systems by addressing current challenges in the form of shortage of human resources, limited budgeting as well as professional expertise. Even though Germany has a robust mental health care system, it still faces ineffective treatment allocation, fragmented organization and care structures and limited flexibility of integrative psychological treatment models, which results in a sharp loss of productivity in the event of a sudden increase in incoming RAS. Hence, our proposed SCCM has the ability to close this gap by delivering well-tailored and dosed psychological interventions according to the symptom burden of individuals, thereby demonstrating an effective model specifically for humanitarian aid settings such as in the case of civil wars or the current Ukrainian war.

However, our results also provide potential indicators that the clinical effectiveness of SCCM may be primarily driven by pharmacological and psychotherapeutic interventions provided by trained clinicians, including psychiatrists, psychologists, and psychotherapists at the highest two intervention levels, 3 and 4. According to meta-analytic evidence, individuals with higher depression scores at treatment begin showed greater clinical improvements compared to patients with lower symptoms severity over the intervention period (Driessen et al., 2010). It can be concluded that for the treatment of major depressive symptoms, tailored interventions are more helpful in achieving symptom relief in an effective and targeted way than for milder courses (Mohr et al., 2019). Looking at studies of internet-based CBT that predominantly include subjects with milder illness courses and can present good evidence regarding clinical and cost-effectiveness while successfully overcoming barriers of stigma, language, scalability, and accessibility (Mohr et al., 2019; Sijbrandij et al., 2017). Thus, digital offerings and community-based approaches can represent in the long-term central pillars in the low-threshold treatment of depressive symptoms. Therefore, future studies should aim at a broader focus beyond pure symptom reduction and measure dimensions of accessibility, scalability, and stigma before considering high-threshold forms of intervention such as costly pharmacotherapies and individual and group therapy by trained clinicians.

Moreover, our treatment approach showed higher cost-effectiveness compared to TAU in Germany's well-structured and organized mental health care. Consequently, outcomes can be extrapolated to other settings and used to strengthen and support currently overburdened health care systems, especially those with limited financial and human resources, such as in most LAMICs (Sijbrandij et al., 2017). However, careful adjustments to our model might be required for LAMIC, as shown by trials in regions of Nigeria (STEP-CARE) (Gureje et al., 2019) and India (Patel et al., 2010) (MANAS), since our present results were still conducted in an academic setting in a high-income country.

Overall, our conclusions concerning improving clinical productivity, as well as treatment provision by embedding digital, group-, individual-, and community-based low-threshold interventions, are of particular relevance considering the organizational and structure of mental health care capabilities of each region as well as in times of pandemics or large migration movements strengthening mental

health care resilience. In conclusion, our innovative SCCM, which demonstrates clinical and cost-effectiveness in alleviating symptoms of depression in refugees and asylum seekers, provides a suitable and well-scalable solution for various mental health care systems, specifically in LAMIC or in humanitarian aid settings and could inform health care guidelines and recommendations worldwide.

### **3.1 Limitations**

The present habilitation project comprises five original scientific studies covering a broad range of methodological and context-specific approaches. However, despite several strengths and novel outcomes due to the heterogeneity of methodological approaches, it also needs to be discussed in light of several limitations. First, *study one to four* build on cross-sectional research methods that hamper any conclusions concerning direct causality. Concerning our research approach within the clinical trial of *study five*, prospective longitudinal designs with multiple measurement points assessing changes across time in various clinical and process outcomes will be required further on, especially in different international settings. Second, aside from using a rater-blinded assessment tool in *study five*, all other variables in *studies one to five* were measured by self-report questionnaires. Even though this approach is common and well-validated in clinical and research psychology and psychiatry, it still focuses primarily on subjective assessment, which can open room for biases. Future studies should place emphasis on rater-blinded, as well as standardized clinical interview measures to minimize biases. However, it needs to be noted that these approaches bring about their own methodological challenges and are often not feasible in settings with limited research and human resources. Third, taking the structural, organizational, but also personal reasons that influence the help-seeking behaviors of RAS into account, the samples recruited in each study might be prone to selection bias, resulting in convenience samples and comparability problems concerning sociodemographic variables. Consequently, outcomes cannot be extrapolated to and considered representative for all Arabic-and Farsi-speaking refugees and asylum seekers. However, even though limitations concerning generalizability remain, the five original studies encompass some of the largest samples and psychological trials that have been conducted with this heterogeneous population in challenging humanitarian settings. Thus, they ultimately contribute to novel and relevant

insights for RAS with a significant focus on psychological research and clinical implications. Lastly, the outcomes of all studies were quantitative in nature. Therefore, upcoming studies should include qualitative research elements or mixed-methods approaches to collect valuable subjective experiences and insights from refugee populations. Such approaches would be specifically crucial in assessing cultural- and language-specific idioms, expressions, and representations of mental illness and distress. Our research has shown that these can be unique to the respective language and cultural context experienced and, therefore, can only be partially captured by western developed psychological and psychiatric assessment tools.

### **3.2 Conclusion**

In summary, the present habilitation project encompasses research on multiple and complex levels of mental health care preferences and expectations, support systems, psychological mechanisms, as well as novel and culturally sensitive treatment approaches for RAS who primarily stem from Arabic- and Farsi-speaking countries. Until today, there are still enormous mental health treatment gaps for RAS, regardless of the country of residence. The current investigations shed light on a variety of facets, including preferences and expectations on psychotherapy, the key role of perceived stress and social support on psychopathology, as well as the representation of symptoms and the influence of stigma in refugee populations. Moreover, we could show that emotional regulation appears to be a vital psychological mechanism mediating the effect between early life stress and the development of psychiatric symptoms, suggesting a direction for personalized psychotherapeutic interventions in refugees. In a last step, we developed a novel stepped collaborative and care model, which proved the effectiveness and cost-effectiveness in alleviating depressive symptoms of adolescent and adult RAS compared to routine mental health care in Germany. Against this background, the outcomes of this habilitation project are relevant because they outline where cultural barriers lie, showcase possible ways of overcoming those and depict a suitable, scalable, and collaborative intervention approach. Our outcomes pave the way for resource-saving, cost-efficient, and tailored psychological interventions, specifically for humanitarian aid and international settings with low human and financial resources. In challenging times

and impending decades, in which large-scale migration movements and pandemics significantly increase the relevance of global mental health, our findings are especially valuable. Consequently, outcomes of the present work make key contributions to and have implications and a meaningful influence on the immediate and long-term mental health and its provision for RAS worldwide.

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## 6. Declaration of Independence

§ 4 Abs. 3 (k) der HabOMed der Charité Universitätsmedizin Berlin

Hiermit erkläre ich, dass

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Datum

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