Title: An analysis of Médecins Sans Frontières' integrated mental health program in Domiz, Iraq: Describing mental health patterns, determining the contact coverage, and describing and predicting the outcomes.

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Table of Contents

List of Abbreviations

CGAS	Children Global Assessment Scale
CHW	Community Health Worker
DoH	Directorate of Health
Domiz 1	Domiz One Refugee Camp
GAF	Global Assessment of Functioning
ICD-10	10th edition of the International Statistical Classification of Diseases
IMC	International Medical Corps
IQR	Interquartile Range
KR-I	Iraqi-Kurdistan
MH	Mental Health
MSF	Médecins Sans Frontières
MSF CH Iraq	Médecins Sans Frontières Switzerland in Iraq
MSF-OCG	Médecins Sans Frontières Operational Centre Geneva
NGO	Non-governmental Organisation
PHC	Primary Health Care
SRQ-20	Self-reporting Questionnaire
WHO	World Health Organization

Project Summary

Background: This project describes mental health (MH) patterns, calculates the contact coverage, and presents the evolution and predictive factors of three functionality assessment scores - SRQ-20, GAF and CGAS - during MSF's MH intervention in Domiz, Iraq, from 1/1/2013 to 30/6/2015.

Methods: Patients who entered the MH program had demographic and consultation information recorded. Demographic and MH patterns were described using univariate analysis. Contact coverage was calculated as per De Silva et al's formula [1]. The evolution of median assessment scores were calculated and tested using the Wilcoxon rank-sum test. The predictors of the evolutions were explored using multilevel mixed-effects linear regression models.

Results: There were 12 308 MH consultations (3 631 patients) during this period. 53.3% of patients were female and 45.4% were under the age of 18. Almost all patients identified themselves as being of Syrian nationality. Anxiety (36.2%), child behaviour disorder (27.4%) and depression (21.3%) were the three main diagnostic hypotheses made at first visit. The overall MH contact coverage was 3.17 visits/1000 refugees/month. The SRQ-20 median score dropped from 10 [IQR 7, 14] to 4 [3, 7]; the GAF median score increased from 6 [5, 7] to 7 [6, 8], and the CGAS median score increased from 6 [6, 7] to 8 [7, 9]. Poorer initial assessment scores and psychosis were associated with poorer evolution of SRQ-20, GAF and CGAS scores.

Conclusions: This study describes useful baseline information for MH patterns and contact coverage, and reveals positive evolutions of functionality assessment scores in MSF's integrated MH program in Domiz.

Keywords

Médecins Sans Frontières, Domiz, Iraq, Mental Health, Integration, Contact Coverage, Self-reporting Questionnaire, Global Assessment of Functioning, Children Global Assessment Scale, Evolution, Predictive Factors

Introduction

Background

The ongoing crisis in Syria is currently the largest driver of displacement in the world; this at a time when the numbers of displaced persons hasn't been as high since World War II [2]. As of the end of June 2015, there were stated to be 250 000 registered Syrian refugees in Iraqi Kurdistan (KR-I), with nearly 100 000 in the Duhok governorate [3]. Within the Duhok governorate, 41 158 persons were registered in Domiz One Refugee Camp (Domiz 1) [3]. In 2012, the Directorate of Health (DoH) asked for Médecins Sans Frontières' (MSF) assistance with, amongst other things, supervising local mental health (MH) teams and implementing a MH intervention. The first MSF activities conducted in Domiz subsequently began in May 2012 [4].

Mental Health in Humanitarian Crises

Mental health and psychological problems occur in all humanitarian crises. The World Health Organization (WHO) has stated that the prevalence of mild to moderate MH disorders, such as mild to moderate depression or anxiety, is expected to rise from 10% to 20% following humanitarian crises, with the prevalence of severe disorders increasing from 2-3% to 3-4% [3]. The stress, horror, uncertainty, experience of loss, and other stressors, undoubtedly place people at an increased risk of psychological, behavioural, psychiatric and social issues [5].

It is difficult to find reliable estimates of MH morbidity and mortality in Syrian populations due to an ineffective health information system, as well as a lack of systematic research [5, 6], and therefore many actors and agencies use the aforementioned WHO estimations [5]. Furthermore, Steel et al. highlight the lack of consistency and challenges with comparability of MH data in their systematic review and meta-analysis, showing that the prevalence rates of depression in post conflict contexts ranged from 3% to 85.5% [5].

An International Medical Corps (IMC) report from 2014, which focused on Syrians accessing IMC services from March to October in 2014, showed that severe emotional disorders, which include anxiety and depression, were the most common MH illnesses managed in adults [7]. Intellectual and development disorders and severe emotional disorders were the most common MH illnesses managed in children [7].

Objectives

- To determine important baseline information of MSF's integrated MH intervention in Domiz, Iraq, during the 30 month period from 1 January 2013 to 30 June 2015, by:
    - Describing the mental health patterns observed;
    - Calculating the overall and case-specific contact coverage.
- To analyse and present the evolution of the functionality assessment scores - SRQ-20, GAF and CGAS – during the intervention;
- To determine the predictive factors associated with the evolution of the functionality assessment scores.

Ethics Approval and Consent to Participate

This analysis fulfilled the exemption criteria set by Médecins Sans Frontières Ethics Review Board for a posteriori analysis of routinely collected data without patient identifiers, and therefore did not require MSF's Ethics Review Board review. It was conducted with permission from Micaela Serafini (Medical Director of MSF Operational Centre Geneva). The World Medical Association's Declaration of Helsinki was respected. Patients provided informed consent to be a part of the mental health intervention.

Methods

Participant and study setting

This paper is a retrospective analysis of MH program data collected from 1 January 2013 to 30 June 2015 at Domiz 1 in Kurdistan, Iraq.

For this intervention, MSF integrated mental health into its medical activities, serving to increase access to MH programs for the population, make treatment available, and to reduce stigma of MH issues [8]. Psychological first aid (PFA), counselling and brief psychotherapy of common MH disorders were provided by psychologists or counsellors at the PHC clinic, who were present 6 days a week [9]. In this case, counsellors were recruited in the community, and were required to hold a social science degree (including education, sociology and social work). They were trained and supervised by an expatriate MH supervisor. Medical staff were also trained in performing PFA. Referrals to the PHC were made from community health workers (CHWs), medical staff (MSF and DoH), other NGOs, the patient's social network, as well as the patients themselves. A referral network was established with the DoH hospitals for patients with severe MH disorders and those requiring ongoing medications. A community outreach strategy was implemented and included community sensitisation activities, collaboration with community and camp leaders, and active case finding of those with severe MH disorders. MH promotion sessions were held, targeting specific groups such as children with behavioural issues, pregnant females, and young, single males.

Patients deemed to require MH support were invited into the MH intervention program and were scheduled visits every 7 or 15 days at the PHC clinic with the available psychologist, psychiatrist or the counsellor. It is important to note that during the program there was an adaption made to consciously target a higher number of children. Naturally, a percentage of the patients only made one visit to the clinic.

Measures and data collection

At their first visit, patients were asked to fill-in a simple questionnaire with key demographic information. The clinician completed a questionnaire with key diagnostic information based on the 10th edition of the International Statistical Classification of Diseases' (ICD-10) Classification of Mental and Behavioural Disorders [10], as well as information about the referral source, precipitating factor and the type of therapy received. The precipitating factors were categorised as: psychiatric (whether the patient needed an immediate psychiatric assessment or if they have a previous psychiatric history), psychological (non-psychiatric mental health precipitant), physical violence, sexual violence or other. The reason for ending therapy was also collected and categorised as follows: completed therapy, mutual agreement prior to completed course, patient's decision against staff advice, loss to follow up, referral and presentation not being mental health related.

Three types of functionality assessments were used during consultations, with some participants completing more than one type. The first type of assessment was the Self-reporting Questionnaire (SRQ-20), which is based on patient responses. It was designed by the World Health Organization (WHO) as an instrument to screen for psychiatric disturbance in PHC settings, especially in developing countries [11, 12]. The score ranges from 1-20, with each 'positive' answer scoring one point, deeming participants with lower scores to have a lower psychiatric disturbance. The second type was the Global Assessment of Functioning (GAF), which is based on clinical assessment [12, 13]. This instrument represents a continuum that takes into account the participant's psychological, social and occupational functioning. The scale is 1-100, which is ordered in intervals of 10, with the higher intervals representing 'higher' assessed levels of functioning. The third type was the Children Global Assessment Scale (CGAS), which is essentially an adaption of the GAF that is more appropriate for use in children under the age of 18 [12, 14]. During the MH program, patients older than 15 years of age would complete the SRQ-20 (sometimes with the assistance of the consultant). The consultant would

complete the GAF for participants older than 15, and the CGAS for participants younger than 15. For the purpose of convenience in this study, GAF and CGAS scores of 1-10 are represented as 1; 11-20 as 2; 21-30 as 3 and so on, up to 91-100 being represented as 10.

An Arabic version and a directly translated Kurdish version of these tools were used.

Analysis

Data was entered onto an excel spreadsheet by a trained data clerk. We used Stata 13 to analyse the data. The data was separated into two datasets – panel and non-panel. All participants were included in the non-panel dataset, whereas only the participants who had two or more visits were included in the panel dataset. The non-panel dataset was used for the analysis of the mental health patterns and the contact coverage. The panel dataset was used for analysing the evolution of outcome scores and the predictive factors.

Demographic and other baseline characteristics were recorded for all participants using univariate analysis. The diagnostic hypotheses made at first visit were then stratified into age groups and gender. In the disaggregated table, a chi-square goodness of fit test was performed to see if the frequencies of the diagnostic hypothesis were significantly different ($p<0.05$) between genders of a particular age group, assuming a 50-50 split in the general population both for simplicity and due to a lack of general baseline information.

Median scores of SRQ-20, GAF and CGAS of the participant's first and last visits were calculated and tested using the Wilcoxon rank-sum test. Median scores and interquartile ranges of the assessments according to the visit number were reported and represented through box plots. We explored the potential predictors of the evolution of three assessments using multilevel mixed-effects linear regression models. Factors included in the univariate analysis were age, gender, marital status, employment status, diagnostic hypothesis made at first

visit, type of therapy, precipitating factor, source of referral, length of therapy, time of first consultation and the initial score of the relevant assessment. A step-wise, backwards approach was then used for the following multivariate analysis. The threshold p-value to include factors in an initial model was 0.4, with all following steps using a threshold of 0.05.

Calculating Contact Coverage

De Silva et al. describe the calculation of contact coverage as a useful means of estimating the coverage of mental health programs [1]. This method has been described as particularly useful in refugee camp settings due to the fact that the estimated overall number of those requiring services is generally unknown [1, 15].

The contact coverage of MSF's MH program was found by determining the overall and case-specific mental health visits per thousand persons per month [1, 15]. The calculations were made by dividing the number of each diagnostic hypothesis made, or total number of initial mental health visits, from 1/7/2014 to 30/6/2015, by the average monthly population in the camp, during the same reporting period, multiplied by 1000. This produced mental health visits/1 000/month for the camp. This 12-month period was chosen as this was when the most reliable camp population data was found, which was sourced from UNHCR data [16, 17].

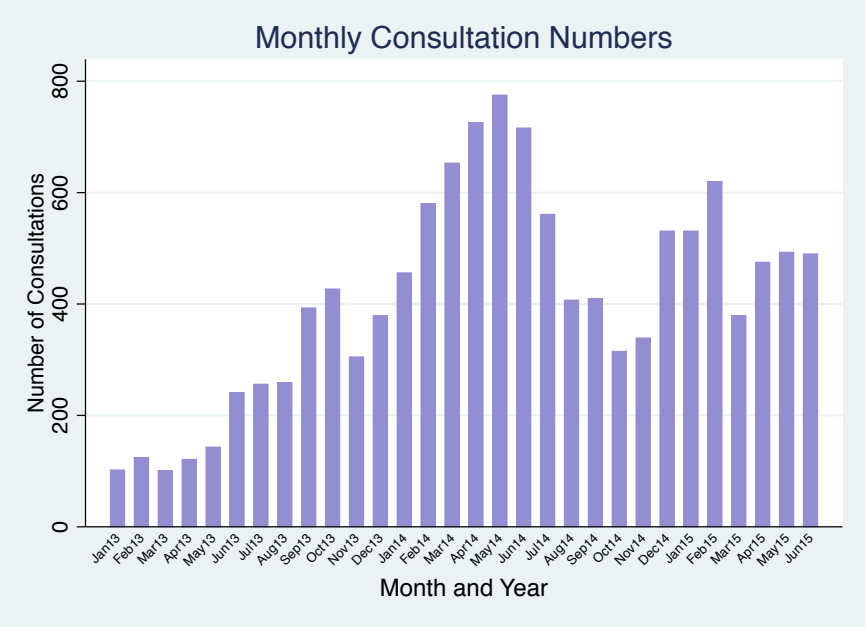
Results

Over the 30 month period from 1/1/2013 to 30/6/2015, 12 308 MH consultations were made. The monthly breakdown of consultations made can be seen in Figure 1. 3 631 patients were seen over this 30 month period. Looking at the period from 1/7/2014 to 30/6/2015, 1 905 patients were seen during 5 551 consultations. UNHCR data shows that Domiz 1 camp reached its population

peak at 65 044 in June 2014, and has since been in steady decline [16]. The camp population was stated as being 41 158 as of June 2015 [17].

2 753 patients (75.8% of total) visited the MSF MH clinic at least twice, which amounted to a total of 11 165 consultations (90.1% of total). The median length of treatment (measured as time between first and last visit) was 74 days (IQR 38 to 139 days). The longest noted therapy time was 730 days.

Figure 1. Monthly MH consultation numbers.



Demographic

53.3% of patients were female and 45.4% of patients were under the age of 18, with 6.7% being under the age of 5. Almost all patients (99.4%) recognised themselves as being of Syrian nationality. Further demographic information can be found in Table 1.

Table 1. Baseline characteristics of all participants.

Characteristic		Number (%)
Gender	Females	1 934 (53.3)
	Males	1 697 (46.7)

Age Group	0-4yrs	243 (6.7)
	5-17yrs	1 398 (38.7)
	18-39yrs	1 529 (42.4)
	>40yrs	440 (12.2)
Nationality	Syrian	3 609 (99.4)
	Iraqi	13 (0.36)
	Lebanese	1 (0.03)
	Unknown/Not listed	8 (0.22)
Marital status	Married	1 342 (37.0)
	Single	1 107 (30.5)
	Divorced/separated	61 (1.7)
	Widowed	50 (1.4)
	N/A	1 058 (29.1)
	Unknown/Not listed	4 (0.11)
Employment	Fixed employee	81 (2.2)
	Occasional employee	253 (7.0)
	Housewife	1 024 (28.2)
	Student	731 (20.1)
	Unemployed	1 284 (35.4)
	Other	237 (6.5)
	Unknown/Not listed	21 (0.58)

Mental Health Patterns

Anxiety (36.2%), child behaviour disorder (27.4%) and depression (21.3%) were the three main diagnostic hypotheses made at the first visit (Table 2).

Table 2. Diagnostic hypotheses made at first visit of all participants.

Diagnostic Hypotheses	**Frequency (% of all)**
Anxiety	1 315 (36.2)
Child behaviour disorder	994 (27.4)
Depression	773 (21.3)
Psychosis	135 (3.7)
Relationship Problem	129 (3.6)
Other	69 (1.9)
Unknown/Not listed	39 (1.1)
Epilepsy*	32 (0.9)
Somatoform Disorder	29 (0.8)
Mental retardation	23 (0.6)

ADHD	19 (0.5)
Autism	17 (0.5)
Personality problem	16 (0.4)
Grief	16 (0.4)
Sexual problem	11 (0.3)
Bipolar disorder	7 (0.2)
Eating problems	5 (0.1)
Substance abuse	2 (0.1)

*Diagnostic hypothesis of epilepsy made if primary diagnostic hypothesis in presence of co-existing MH co-morbidity.

Table 3 contains the disaggregated information of diagnostic hypotheses made at the first visit, and also looks at the significant differences in frequencies between genders in the specific age groups. We see significant differences in the frequency of the diagnostic hypothesis of anxiety between genders in people aged over 18 (534 females compared with 361 males). In the age group 5-17 years, the diagnostic hypothesis of child behaviour disorder is significantly higher in males (490 versus 339). The diagnostic hypothesis of depression is a lot more common in females in all age groups above the age of 5 (5-17 year olds: 39 versus 16; 18-39 year olds: 369 versus 168; over 40: 118 versus 58). The diagnostic hypothesis of psychosis is significantly higher in males in the age group 18-39 years (54 versus 19).

Table 3. Diagnostic hypotheses by age groups and gender; statistically significant differences in gender highlighted in red.

Diagnostic Hypotheses	**Age Groups**							
	0-4yrs		5-17yrs		18-39yrs		>40yrs	
	F	M	F	M	F	M	F	M
Anxiety	**16**	**36**	170	189	**426**	**303**	**108**	**58**
Child behaviour disorder	74	83	**339**	**490**	3	2	1	1
Depression	1	1	**39**	**16**	**369**	**168**	**118**	**58**
Psychosis			4	4	**19**	**54**	26	27
Relationship Problem	4	6	33	21	29	25	5	6
Other	3	2	8	11	22	17	4	2
Unknown/Not	1	0	2	3	11	8	4	4

listed								
Epilepsy	0	3	5	8	6	9	1	0
Somatoform Disorder			3	2	**13**	**4**	3	3
Mental retardation			7	9	2	5		
ADHD	0	5*	**2**	**12**				
Autism	2	5	2	8				
Personality problem	0	1	0	4	6	3	1	1
Grief			3	0	**9**	**1**	3	0
Sexual problem					**9**	**2**		
Bipolar disorder					1	2	2	2
Eating problems			2	0	1	0	2	0
Substance abuse			1	1				

*Unable to determine if significantly different using chi-square goodness of fit test due to presence of zero value

Contact Coverage

The overall mental health contact coverage by the MSF over the period from 1 July 2014 to 30 June 2015 was 3.17 visits per thousand refugees per month. Anxiety (1.12), child behaviour disorder (0.91) and depression (0.65) had the highest contact coverage, with other results also seen in Table 4.

Table 4. Contact coverage between July 2014 and June 2015.

Diagnostic Hypothesis	Contact Coverage*
Anxiety	1.12
Child behaviour disorder	0.91
Depression	0.65
Psychosis	0.10
Somatoform disorder	0.032
Epilepsy	0.027
Mental retardation	0.013
Overall	**3.17**

*Visits per thousand per month, calculated by using the number of cases per specific diagnostic hypothesis over this 12 month period multiplied by 1000 as the numerator, with the average monthly camp population multiplied by 12 as the denominator.

Description of Outcomes

Table 5 shows the demographic characteristics of those participants who attended the clinic more than once. Table 6 represents information about the diagnostic hypotheses, type of therapy, precipitating factor and source of referral, disaggregated by age, of those who attended the clinic more than once. We have used 15 years for the disaggregation of age, as this was the age that determined the type of functionality assessment.

Table 5. Demographic characteristics of patients at first visit of those who attended the program more than once.

Characteristic		Number (%)
Gender	Females	1 447 (52.6)
	Males	1 306 (47.4)
Age Group	0-4yrs	188 (6.9)
	5-14yrs	1 037 (37.8)
	15-39yrs	1 167 (42.6)
	>40yrs	347 (12.7)
Nationality	Syrian	2 744 (99.7)
	Iraqi	6 (0.2)
	Lebanese	1 (0.04)
	Unknown/Not listed	2 (0.07)
Marital status*	Married	976 (35.5)
	Single	750 (27.3)
	Divorced/separated	49 (1.8)
	Widowed	40 (1.5)
Employment*	Fixed employee	65 (2.4)
	Occasional employee	197 (7.2)
	Housewife	744 (27.0)
	Student	619 (22.5)
	Unemployed	923 (33.5)
	Other	192 (7.0)
	Unknown/Not listed	13 (0.5)

* Includes only candidates deemed relevant for the category by the staff member, taking age and other social factors into consideration.

Table 6. Disaggregated mental health and intervention characteristics, by age, of those who attended the clinic more than once.

Characteristic		Number (% in age group)	
		< 15 years	>= 15 years
Diagnostic Hypothesis	Child behaviour disorder	771 (62.8)	N/A
	Anxiety	314 (25.6)	630 (40.8)
	Depression	24 (2.0)	598 (38.7)
	Psychosis	4 (0.3)	108 (7.0)
	Other	112 (9.1)	190 (12.3)
	Unknown/not listed	2 (0.2)	18 (1.2)
Type of therapy	Individual	1064 (87.0)	1244 (80.6)
	Family	148 (12.1)	149 (9.7)
	Group	7 (0.6)	78 (5.1)
	Couple	1 (0.1)	23 (1.5)
	Other	0	3 (0.2)
	Unknown/ not listed	3 (0.2)	47 (3.0)
Precipitating factor	Psychological	1175 (95.9)	1277 (82.7)
	Physical violence	15 (1.2)	31 (2.0)
	Psychiatric	10 (0.8)	148 (9.6)
	Sexual violence	1 (0.1)	19 (1.2)
	Other	9 (0.8)	12 (0.8)
	Unknown/not listed	15 (1.2)	58 (3.8)
Source of referral	MSF community health worker	623 (50.9)	484 (31.3)
	Family/friends	200 (16.3)	265 (17.2)
	MSF medical team	161 (13.2)	341 (22.1)
	NGO	72 (5.9)	46 (3.0)
	Self-referral	33 (2.7)	194 (12.6)
	Other	121 (9.9)	142 (9.2)
	Unknown/not listed	14 (1.1)	72 (4.7)

Assessment Results

1 424, 1 738 and 417 patients completed SRQ-20, GAF and CGAS assessments respectively at some stage during their MSF intervention. This was not necessarily first performed on the first visit. The overall median number of visits was 3 [IQR 2, 5] [min 2, max 26]. The median (IQR) SRQ-20 score dropped from 10 (7-14] to 4 (3-7) from the first to last visit (median visits 3 [2-5]). The median

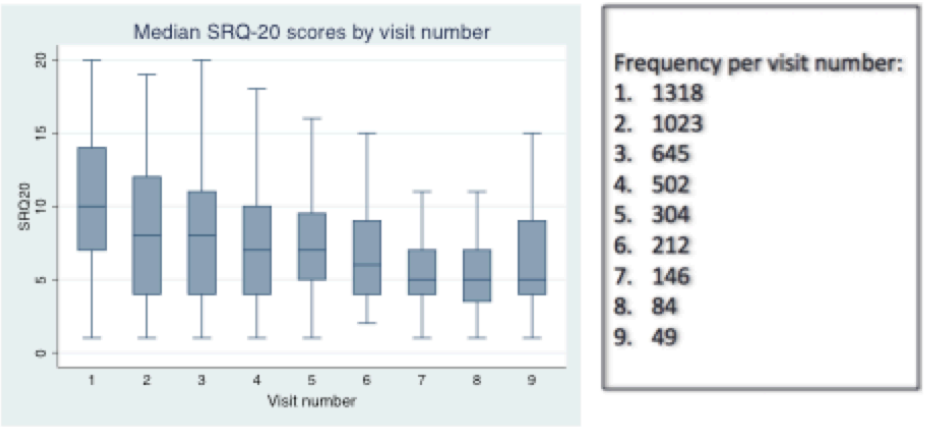
(IQR) GAF score increased from 6 (5-7) to 7 (6-8) (median visits 3 [2-5]), and the median (IQR) CGAS score increased from 6 (6- 7) to 8 (7-9)] (median visits 4 [3-5]). All evolutions produced a Wilcoxon rank-sum test of $p < 0.0001$.

Table 7. Median assessment scores of patients' first and last visit.

Measurement	Visit	Median [q25, q75]	Wilcoxon rank-sum
SRQ-20	First	10 [7, 14]	
	Last	4 [3, 7]	P<0.0001
GAF	First	6 [5, 7]	
	Last	7 [6, 8]	P<0.0001
CGAS	First	6 [6, 7]	
	Last	8 [7, 9]	P<0.0001

Figure 2 is a box plot that represents the median score and the interquartile range of the SRQ-20 assessment according to visit number of the patients in the study. We have information as to why therapy was ended for 703 patients (49% of all people who completed SRQ -20 assessments). It was a mutual agreement between patient and MSF staff member on 468 occasions (prior to completed course of therapy), stopping therapy against medical advice on 139 occasions, the completed course of therapy on 77 occasions, not mental health related on 10 occasions, referral to another NGO on 5 occasions and there was loss to follow up on 4 occasions.

Figure 2. Median SRQ-20 scores by visit number.



*The whiskers represent values within the range of 1.5 IQR from the lowest and highest quartiles

Figure 3 is a bar chart that looks at the median SRQ score on the first visit in relation to the referral source. The graph highlights that the median SRQ score was highest for referrals made by other patients (14), closely followed by other NGOs (13). The median SRQ score for patients referred by community health workers was 9.

Figure 3. Median first visit SRQ-20 scores by referral source.

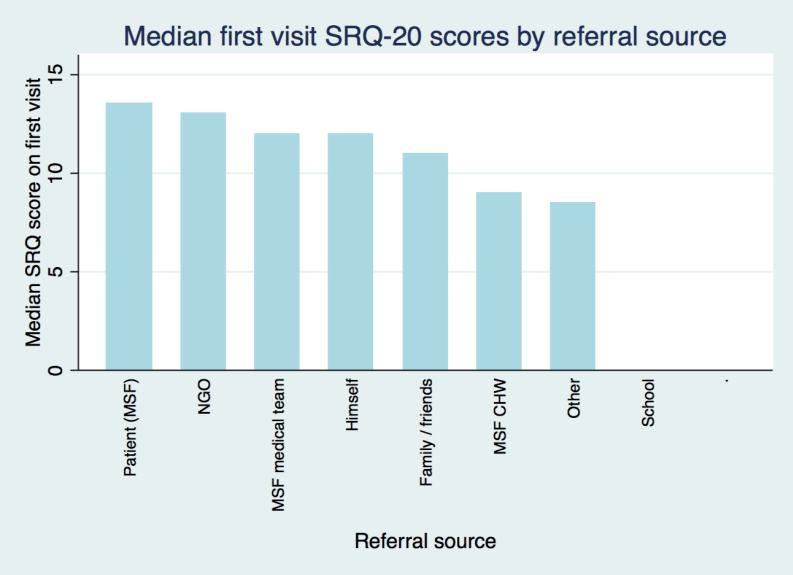
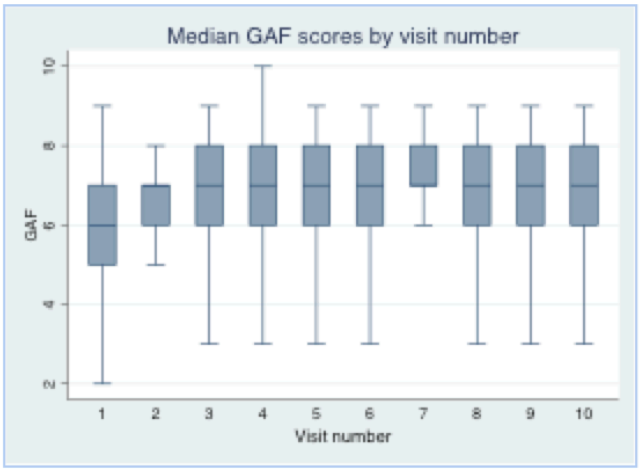


Figure 4 is a box plot that represents the median and the interquartile range of the GAF scores according to visit number of the patients in the study. For 773 patients (44% of all people who completed GAF assessments) we have information as to why therapy was ended. It was a mutual agreement between patient and MSF staff member on 493 occasions (prior to completed course of therapy), stopping therapy against medical advice 175 occasions, the completed course of therapy on 80 occasions, not mental health related on 12 occasions, referral to another NGO on 7 occasions and there was loss to follow up on 6 occasions.

Figure 4. Median GAF scores by visit number.

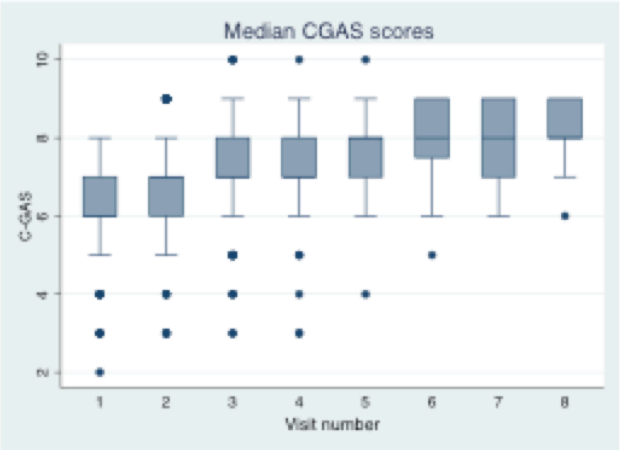


Frequency per visit number:
1. 1541
2. 1039
3. 711
4. 477
5. 331
6. 226
7. 133
8. 71
9. 51

*The whiskers represent values within the range of 1.5 IQR from the lowest and highest quartiles

Figure 5 is a box plot that represents the median and the interquartile range of the CGAS scores according to visit number of the patients in the study. We have information as to why therapy was ended for 189 patients (47% of all people who completed CGAS assessments). It was the completed course of therapy on 132 occasions, a mutual decision between patient or family member and MSF staff member on 15 occasions (prior to completed course of therapy), referral to another NGO on 12 occasions, loss to follow up on 8 occasions and it was not mental health related on 3 occasions.

Figure 5. Median CGAS scores by visit number.



Frequency per visit number:
1. 201
2. 264
3. 256
4. 200
5. 143
6. 88
7. 50
8. 24

*The whiskers represent values within the range of 1.5 IQR from the lowest and highest quartiles; the dots represent outliers.

Predictive Factors

Table 8 presents the factors significantly associated with the evolution of SRQ-20 scores. Positive evolution was associated with older age, personality problems, psychosis, self-referrals, referrals from a family or friend member, referrals from the MSF medical team, and higher baseline scores. Negative evolution was associated with anxiety, family and group therapy, and a psychological precipitant.

Table 8. Factors associated with the evolution of SRQ-20 scores over time.

Predictor		Adjusted Coefficient* [95% CI]
Age (per 10 year increments)		0.13 [0.033, 0.22]
Diagnostic Hypothesis	Depression	Baseline
	Anxiety	-0.27 [-0.48, -0.054]
	Personality problem	1.12 [0.075, 2.17]
	Psychosis	1.21 [0.62, 1.79]
Therapy type	Individual	Reference
	Family	-0.41 [-0.80, -0.014]
	Group	-0.76 [-1.25, -0.27]
Source of referral	MSF Community Health Worker	Reference
	Family / friends	0.64 [0.18, 1.11]
	Self-referral	0.91 [0.41, 1.40]
	MSF Medical Team	0.75 [0.34, 1.19]
Initial SRQ score (per 1 unit increments)		0.71 [0.68, 0.73]

*Adjusted for other predictors in table, as well as length of therapy and date of first consultation

Table 9 presents the factors significantly associated with the evolution of GAF scores. Positive evolution was associated with: being male, being widowed, being a fixed employee, housewife or an occasional employee, group and family therapy, and a baseline score higher than 6.

Negative evolution was associated with: older age, autism, mental retardation, personality problems, psychosis, referral from a family member or friend, the MSF medical team or another patient.

Table 9. Factors predicting the evolution of GAF scores over time.

Predictors		Adjusted Coefficient* [95% CI]
Gender	Female	Reference
	Male	0.13 [0.02, 0.24]
Age (per 10 years increments)		-0.13 [-0.17, -0.088]
Marital status	Married	Reference
	Widowed	0.31 [0.06, 0.55]
Employment status	Unemployed	Reference
	Fixed employee	0.22 [0.013, 0.42]
	Housewife	0.23 [0.094, 0.36]
	Occasional employee	0.24 [0.11, 0.37]
Diagnostic Hypothesis	Depression	Reference
	Anxiety**	0.084 [-0.00034, 0.17]
	Autism	-1.65 [-2.81, -0.49]
	Mental retardation	-1.81 [-3.01, -0.61]
	Personality problem**	-0.36 [-0.74, 0.02]
	Psychosis	-1.15 [-1.29, -1.01]
Precipitating factor	Psychiatric	Reference
	Psychological**	-0.16 [-0.32, 0.0014]
	Other***	-1.19 [-2.32, -0.055]
Therapy type	Individual	Reference
	Family	0.23 [0.08, 0.37]
	Group	0.62 [0.43, 0.81]
Source of referral	MSF Community Health Worker	Reference
	Family/friends	-0.18 [-0.31, -0.037]
	MSF Medical Team	-0.19 [-0.32, -0.065]
	Other patient	-0.63 [-1.03, -0.23]
Initial GAF score	≤ 6	Reference
	> 6	1.30 [1.22, 1.39]

*Adjusted for other predictors in table, as well as length of therapy
**Included in table despite p value falling just outside 0.05 value
***Unfortunately there was no elaboration as to what 'other' specified in dataset

Table 10 presents the factors significantly associated with the evolution of CGAS scores. Autism, mental retardation, psychosis were significantly associated with

lower scores over time. A baseline CGAS score of greater than 6 was significantly associated with a higher score over time.

Table 10. Factors predicting the evolution of CGAS scores over time.

Predictors		**Adjusted Coefficient* [95% CI]**
Diagnostic Hypothesis	Child behaviour disorder	Reference
	Autism	-2.92 [-3.62, -2.22]
	Mental retardation	-2.18 [-2.81, -1.55]
	Psychosis	-1.54 [-2.39, -0.69]
Initial CGAS score	≤ 6	Reference
	> 6	1.18 [0.99, 1.38]

*Adjusted for other predictors in table

Discussion

This is the first analysis of MSF's mental health intervention in Domiz, Iraq, and it has revealed several important findings.

Firstly, we can look at the number of MH consultations performed monthly and see that there was a substantial increase in consultations up until mid 2014, with fluctuating levels from then until mid 2016. This finding is not entirely consistent with the changes in monthly camp populations, and may be a reason to explore how certain programs, such as community awareness programs, may have influenced people attending the clinics and subsequently the number of consultations.

Mental Health Patterns

The reason as to why the term 'diagnostic hypotheses' was used in this study rather than 'diagnosis' was due to the complex nature of using the ICD-10, and the recognition that this tool is designed to be used by a qualified psychiatrist or

psychologist after spending an adequate amount of time with a patient in the appropriate context [10].

The top three diagnostic hypotheses that were made on the first visit in this study were anxiety, child behaviour disorder and depression. As mentioned earlier, MSF uses the ICD-10, making it difficult to directly compare with studies that have used different classification methods. Numerous studies in similar contexts use the seven categories of mental, neurological, and substance use problems (MNS) that were developed in a consultative process with experts from WHO, other UN agencies, and international NGOs active in mental health activities. A notable difference with this method is the inclusion of neurological issues. Kane et al's analysis of UNHCR's health information systems in 90 refugee camps showed that epilepsy resulted in the most MNS visits [10]. Epilepsy is generally an issue treated by the MSF medical team, and the MSF MH team usually only become involved if there is a significant MH co-morbidity. If the MSF professional deems that epilepsy is still the patient's primary diagnostic hypothesis, then it is documented as such.

Severe emotional disorders (including anxiety and depression) caused the majority of MH cases managed by IMC as described in their Syria Response report [7]. Emotional disorders resulted in the third most visits behind epilepsy and psychotic complaints in Kane et al's analysis [15]. When comparing to a MSF cohort study in Lebanon looking at people aged over 18, we see that depression was the most prevalent MH diagnostic hypothesis (28.8%), followed by anxiety (15.6%) and psychosis (11.5%) [12].

Notably, 45.4% of the patients who attended MSF's MH services were under the age of 18, with 6.7% being under the age of 5. This is quite a high proportion of children when compared to similar programs, and suggests why there were such a high number of cases of child behaviour disorder in the program. In comparison, it was documented that only 18.5% of mental health cases managed by IMC in various regions of the Syrian response were children under the age of 18 [7].

Furthermore, disaggregating the data by breaking it down into age groups and then directly comparing the frequency of diagnostic hypotheses by gender has revealed some pertinent information, including observing the frequencies of diagnostic hypotheses made in children less than 5 years of age. An issue of quality is raised when we see that diagnostic hypotheses of anxiety, depression, relationship problems, ADHD and personality problems have been made in this age group. The ICD-10 Classification of Mental and Behavioural Disorders Manual states that caution must be taken when using the ICD-10 for young children, and one could argue the validity and appropriateness of making such diagnostic hypotheses [18]. We can see that the diagnostic hypothesis of anxiety and depression were made significantly more in females than males in the over 18 age groups (534 versus 361 for anxiety; 487 versus 226 for depression). As with all information ascertained from this table, this does not necessarily mean that the incidence of anxiety is higher in females than males as we do not have the baseline information of the population to make such an inference. This might instead be an indicator of acceptance of treatment being higher in females; however, this would need to be verified. For comparison, we can see in Kane et al's analysis that more health visits due to 'emotional disorder' were made by females compared with males (17 411 versus 9 662) [15]. A systematic review of Iraqi refugees also found that Iraqi refugee women have higher rates of affective disorders, which includes depression, than men [19].

The disaggregated data also shows us that significantly more males were given the diagnostic hypothesis of psychosis compared with females (54 versus 19) in the 18-39 year age group on their first visit. These overall numbers of psychosis are considerably lower than what we see with anxiety and depression, which is encompassed by the category 'emotional disorder' in the seven MNS categories. This finding is contrary to the finding of Kane et al's analysis, which was that the service use of psychotic disorders was higher than that for emotional disorders in absolute terms [15].

Contact coverage

The study found that the overall contact coverage for mental health visits was 3.17 persons per 1000 per month in Domiz 1. As a stand-alone figure, this is difficult to interpret, but what we can do is compare this with calculations made in similar settings, such as those made by Kane et al. of mental health activities in the 90 refugee camps across 15 low and middle income countries [15]. Kane et al. found that the highest contact coverage for mental health visits was 23.69/1000 persons/month in Liberia, and the lowest was 0.24/1000 persons/month in Zambia [15]. Looking at countries in WHO's designated Eastern Mediterranean Region, we see that the average contact coverage for mental health visits in Yemen was 4.61/1000 persons/month, and in Djibouti it was 4.99/1000 persons/month. It is important to note once again though that Kane et al. used the seven categories of mental, neurological and substance use problems (MNS) as their diagnostic tool. This means that Kane et al.'s analysis is likely to have higher estimates than those in this paper, due to their inclusion of epilepsy as a mental health condition.

If we look at the numbers per diagnostic hypothesis, we see that anxiety had the highest contact coverage in our study at 1.12, followed by child behaviour disorder at 0.91, depression at 0.65 and psychosis at 0.1. The rate of psychosis is noticeably lower when compared to Kane et al's analysis, where in Yemen it was 0.87/1000 persons/month and in Djibouti it was 0.43/1000 persons/month [15]. This raises the question as to why this number is considerably lower in MSF's intervention, and it would be interesting to look at how staff diagnosed psychotic episodes, and if this was consistent with the ICD-10.

These contact coverage calculations can serve as an example of how other MSF MH interventions can attempt to measure access to services and coverage of its MH programs. Ideally, this data should be disaggregated in order to determine equity of coverage between demographic and social determinant profiles.

Description and prediction of outcomes

We have seen an improvement in the functional assessment scores of our patients, represented by a decrease in SRQ-20 individual scores, and an increase in both GAF and CGAS individual scores in this integrated MH program. Whilst we cannot prove direct causative associations, this is nevertheless very encouraging. The CGAS was only incorporated into the integrated mental health program at the beginning of 2015 (with all but one CGAS assessments completed in 2015), highlighting that there was a large emphasis of treating children towards the latter part of the analysis period.

The evolution of SRQ scores (dropping from a median score of 10 to 4) showed a pleasing reduction, particularly considering the threshold score as being arbitrarily set at 7 [20] based on WHO documents and previous field observations. In comparison with a similar MH program, an analysis of SRQ-20 evolution in an integrated MSF MH program in the Philippines in 2009 showed a change in SRQ scores of 7 to 3 from first to last visit [9]. Looking at the box plot, which illustrates the median and quartile scores specific to each visit number, we see a stabilisation of the median SRQ-20 score after the 7th visit. In Bastin et al's analysis of the evolution of SRQ-20 scores over time in a similar program in Lebanon, they see a similar stabilisation of scores at around the 5th visit [12]. It is important to note, however, that the numbers become more difficult to interpret as fewer patients attended a higher frequency of visits.

The evolution of GAF scores (median score changing from 6 to 7, with the lower quartile scores changing from 5 to 6) were similar to the integrated mental health program in Philippines, which showed a change from 6 to 7 [9]. The stabilisation of GAF scores seen in the box plot representation occurs at the 3rd visit. These changes are evidently not as marked as the SRQ-20 score changes, a pattern also elicited in Bastin et al's analysis [12], who suggested inter-rater reliability issues as a possible limitation to the use of GAF only [12].

The evolution of CGAS scores (median score increasing from 6 to 8, with the lower quartile changing from 6 to 7) was similar to that of the GAF evolution. The box plot representation shows a stabilisation of CGAS scores after the 3rd visit number, however we continue to see improvements in the lower extreme values of CGAS scores even after this stabilisation of the median score. From the 7th visit onwards, the minimum CGAS score documented was 6.

The positive and negative predictive findings calculated in the analysis are consistent with those of Bastin et al's analysis [12], and perhaps warrant a discussion as to how future integrated MH programs can better include patients with psychosis or with severe MH cases independent of diagnosis. We also see that family and group therapy appears to provide better results than individual therapy in terms of SRQ-20 and GAF scores, but this may be as a result of selection bias rather than being an actual causative association. This also may be due to differences in reliability of the assessments themselves being completed in the individual therapy context compared with family or group contexts. In terms of SRQ-20 scores, we see that those who were referred by CHWs tend to have a better evolution of scores compared with those who self-refer or who are referred by family or friends, with the latter being consistent with what was observed with the evolution of GAF scores. This suggests that CHWs are well suited to detect MH cases in the early stages, with beneficial prognostic implications. This is supported by Figure 2, which shows that the median SRQ-20 score on the first visit for patients referred by a CHW was lower, and hence better prognostically, than for referrals made by other patients, other NGOs, the MSF medical team, friends or family members, and self-referrals.

Limitations

There were several limitations and challenges faced that need to be highlighted. Many of the patient and consultant questionnaires were not completed or appropriately filled, resulting in an incomplete dataset. Also, there was a lack of uniformity in the number of times and on which visits each patient completed

the assessments. There was limited information about why people ended their therapy, and how many of these were lost to follow up. Also, only the diagnostic hypotheses made on the first visit were considered in this study, meaning that multiple diagnostic hypotheses and co-morbidities were not considered.

It was difficult to make comparisons with mental health data collected by UNHCR, who have done a considerable amount of analyses of mental health in refugee camps, due to the different diagnostic tools used. This further highlights the great need to harmonise and define common standards for coding data at the global level [21].

Admittedly, there was a lack of important predictive factors used in the analytic models, including important social determinants such as access to important services including electricity and water, level of education, personal and financial support and medical coverage. There are also a few issues raised when examining the precipitating factors used in the data collection and analysis. Firstly, the differentiation between psychiatric and psychological made at the data collection stage was based purely on the impression as to whether the patient needed an immediate psychiatric assessment or if they had a previous psychiatric history, and there is no objective or standardised tool to do so. Secondly, the numbers of reported sexual violence as a precipitating factor is likely to be a gross underestimation, which questions how information about this sensitive issue is collected. This issue has been discussed in the field, but the complexity of the issue naturally provided several challenges. There have been numerous documented cases of domestic violence in the camp, with noted reluctance of local staff to report this as sexual and gender based violence (SGBV). An evaluation of MSF's psychological support for victims of SGBV in Congo showed improvements in patient's assessment scores over time, including GAF scores [22]. This should provide impetus for similar support programs to be implemented in other similar contexts when possible and feasible, which will naturally require accurate sexual violence information to be collected.

An important issue to mention is the absence of contextually valid monitoring tools available for use. SRQ-20 was initially developed as a screening tool, and not as a means of monitoring patients' progress [11]. Numerous studies have highlighted the validity of using the SRQ-20 as a screening tool in numerous contexts [23-26], however some of these also go on to explain the importance of validating instruments along with cultural context and gender [25, 26]. Promisingly, a study based in Rwanda showed that in the context of their research, the SRQ-20 met the criterion of being time invariant, which is important in measuring symptom change over time [24]. Unfortunately, there is minimal research that validates the use of GAF and CGAS in monitoring patient progress in contexts similar to that of this research. Currently, MSF is experimenting with different tools that are easier for staff to use, and are also being validated in the numerous cultural contexts.

Conclusion

This study is MSF's first attempt to analyse its MH intervention in Domiz 1, Iraq. The highest frequencies of diagnostic hypotheses were due to anxiety, child behaviour disorder and depression, with the study having a noticeably high percentage of participants under the age of 18. The frequency of psychosis is considerably lower than what other studies have shown in similar contexts, and is substantially lower than frequencies of anxiety and depression. Gender differences between diagnostic hypotheses were noted, and should serve as a base for further exploration, rather than as conclusive information.

The contact coverage of mental health issues, as per the ICD-10, of MSF's MH intervention was shown to be 3.17 per thousand persons per month, and this should serve as a baseline figure for ongoing monitoring of access to the MH programs.

The study has revealed positive evolutions of functionality assessment scores with MSF's integrated mental health intervention. Despite being unable to prove

direct causation, the results are nevertheless encouraging and potentially could be indirectly perceived as positive efficacy of the integrated program. Naturally, it is important to continue to attempt to find contextually valid, feasible and appropriate functionality assessment tools that are better served to monitor patient outcomes. Furthermore, this study supports previous research conducted by MSF in that there is a need to better address and treat severe mental health disorders, and perhaps future integrated programs can be adapted to better include these patients.

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Work Plan

September 2015	Received and cleaned dataset; brief literature review;
October – November 2015	Analysis of the dataset using STATA13 statistical package. Routine meetings in Geneva to discuss and seek support from mental health epidemiology/biostatistics advisor;

December – January 2016	Interpretation of statistical analyses; writing of manuscript and subsequent editing;
May 2016	Presentation of results at MSF Scientific Days in London;
December 2016	Editing the format of the manuscript to be suitable for BMC Conflict & Health Journal submission (as per MSF-Suisse's recommendation);
April – June 2017	Editing the format of the manuscript to be suitable for submission to University of Barcelona as a Master's Final Project.

Resources

STATA13 Statistical package
Microsoft Office – Excel and Word

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Annex

Annex 1. Médecins Sans Frontières' Ethic Review Board Exemption Certificate

MEDECINS SANS FRONTIERES
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Geneva, 8 June 2017

From: Tammam Aloudat, Deputy Medical Director
Medecins Sans Frontieres (MSF) Switzerland

To: University of Barcelona Ethics Review Board

Re: ERB Exemption

Dear Madam, Sir,

I would like to confirm that I research titled: "Describing and predicting the outcomes of an integrated mental health program in Homiz, Iraq" done in MSF project by Wood et al. has met the criteria of MSF ERB for exemption from ethics review. This has been verified and approved by MSF Switzerland Medical Director.

This letter is to certify that the submission of the thesis to the University of Barcelona by Mr. Benjamin Wood is exempted from MSF ethics review and hence can be admitted accordingly.

Please feel free to communicate with me if any further explanations are needed.

Sincerely,

Tammam Aloudat, MD. MPH.

Deputy Medical Director, MSF CH

T. Aloudat

Médecins Sans Frontières est une organisation humanitaire internationale sans but lucratif.
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