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Things change: The early identification of patients with an unfavourable prognosis

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Chapter 2

Mental healthcare utilization for depressive and anxiety disorders: The impact of treatment duration.

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Submitted

ABSTRACT

Objective
To quantify the impact on mental healthcare utilization in relation to treatment duration, in patients with depressive or anxiety disorders.

Design
Cohort study based on administrative data.

Setting
Standard care within a regional mental health care provider.

Participants
Patients (aged ≥ 18) with a diagnosis of a depressive or anxiety disorder and a first face-to-face contact between January 2010 and June 2011; closing date of the study June 2013.

Main Outcome(s) and Measure(s)
Absolute frequency and contact density of face-to-face contacts.

Results
For patients with a depressive disorder, a longer treatment duration (>24 months) (26% of patients) accounted for more than 63% of all face-to-face contacts, and contact density in the initial six months of treatment counted on average 11 more face-to-face contacts. For patients with an anxiety disorder, a longer treatment duration (22% of patients) accounted for more than 55% of all face-to-face contacts; and contact density counted on average 7 more face-to-face contacts in the initial six months of treatment. For both depressive and anxiety disorders, contact density gradually decreased over time on average for all patients with the exception of patients with a treatment duration longer than 24 months.

Conclusions and Relevance
Patients with a longer treatment duration have a high impact on use of mental healthcare resources. For patients with a longer duration of treatment, contact density was already higher in the initial six months of treatment, and density did not decrease over time. Further research to identify patients early in their treatment course and targeted interventions for this group could be promising to improve outcome and reduce costs.

INTRODUCTION

Depressive and anxiety disorders are the most common mental disorders, with an estimated number of respectively 298 and 273 million people, equivalent to approximately 4.1% and 3.7% of the world's population.[1] These highly prevalent disorders are associated with a high burden of disease and high impact on society, translating into substantial direct and indirect costs.[2,3,4] Direct costs are related to treatment and utilization of other healthcare resources, and indirect costs are related to reduced quality of life, decreased productivity, absenteeism, and functional impairment in personal and interpersonal areas of life.[5,6]

Most direct costs for patients with a depressive or an anxiety disorder, are generated by a relatively small group of patients with a high healthcare resource utilization: in psychiatric services 10-30% of patients may account for 50 to 80% of mental healthcare resource utilization.[7] A study focusing on high utilizers of healthcare resources in patients with a depressive disorder demonstrate that the top 10% of the patients may accounted for approximately 50% of all-cause costs.[8] One metanalysis in patients with generalized anxiety disorders found that high utilization of health care resources was partly explained by longer duration of treatment, suggesting that treatment duration is one of the important factors contributing to high utilization of resources.[9]

Detailed quantified knowledge about mental healthcare related costs in these highly prevalent mental disorders can inform healthcare policies and potentially allocation of resources to identified patient groups.[10] The aim of this study was to quantify the utilization of resources in the treatment of depressive and anxiety disorders in a single mental health institution, focusing on absolute number of face-to-face contacts and number of contacts within fixed time periods (density), comparing patients with different lengths of treatment duration.

METHODS

We performed a cohort study based on administrative data of GGZ Rivierduinen, a Regional Mental Health Care Provider (RMHCP) in the Western part of The Netherlands. Patient-identifiable data were removed from the database to secure patients' confidentiality and to comply to Dutch law on research with clinical data. The use of these anonymized data for research has been approved by the Ethical Review Board of Leiden University Medical Centre (LUMC).

Patients

The study was based on administrative data containing information on type and frequency of face-to-face contacts recorded between January 2010 and June 2013. For the current study, we selected consecutive outpatients aged ≥ 18 with an initial face-to-face contact at GGZ Rivierduinen in an 18 months period between January 2010 and June 2011, with a primary clinical diagnosis of a depressive or anxiety disorder according to the attending physician. In the administrative system of GGZ Rivierduinen, the primary clinical diagnosis represents the primary focus of clinical care. The diagnostic classification was based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR) andincluded depressive disorders (coded as 296.20 - 296.24, 296.30 - 296.34, 296.90, 300.4 or 311) and anxiety disorders (coded as 300.00, 300.01, 300.02, 300.21-300.23, 300.29, 300.3, 308.3 or 309.81). As we could observe face-to-face contacts until June 2013, we had a minimum of two years of follow-up for each patient. The final sample included 3,814 patients, with a total of 149,059 face-to-face contacts. Data on age and sex was extracted from administrative data of GGZ Rivierduinen.

Study outcome: face-to-face contacts

The dataset included information about all face-to-face patient contacts to the RMHCP. The treatment duration was calculated starting at the first face-to-face contact until either the last contact before the close of treatment, or the closing date of the study. These face-to-face contacts were labelled diagnostic, routine outcome monitoring,[11] pharmacotherapy or psychotherapy sessions. Our primary outcome was the total number of face-to-face contacts per patient. Given that each type of contact contributes to the utilization of resources, we counted all face-to-face contacts, without differentiation between various types of contacts. The secondary outcome was the frequency of face-to-face contacts over time (contact density), defined as the number of face-to-face contacts per 6 months.

Statistical analysis

Analyses were performed separately for patients with a depressive disorder and patients with an anxiety disorder. Baseline age was expressed as mean (standard deviation), and sex as number (percentage). Total treatment duration was calculated for each patient, starting at the first face-to-face contact and ending either at the last face-to-face contact before the close of treatment, or at the closing date of the study. Next, we stratified patients into five subgroups, according to total treatment duration (< 6 months, 6-12 months, 12-18 months, 18-24 months, and > 24 months) and calculated the proportion of the total number of patients in each of the subgroups. To calculate the impact on

resources, we counted the number of face-to-face contacts per subgroup and calculated the proportion of the total number of face-to-face contacts.[12]

To determine contact density of face-to-face contacts, we counted the number of face-to-face contacts in every six-month period of treatment duration, and computed the mean number of face-to-face contacts for each of the subgroups within the consecutive six months' periods. We only considered contact density for patients who were under treatment for the whole respective six months' period. For each of the subgroups, contact density was compared to contact density of the subgroup with a treatment duration longer than 24 months, using independent sample t-test.

Sensitivity analysis

Our final sample included 719 patients (19%) who were still in treatment at the closing date of the study (withdrawn alive). As a consequence, we could not observe ongoing treatment for these patients. To explore the potential impact of this unobserved treatment time, we performed a sensitivity analysis, where we limited the sample to an inclusion period of six months, between January 2010 and June 2010. This reduced the total sample substantially, but increased the minimum observation time from two to three years. Thus, we could approximate the impact of missed observation time to some extent, by repeating the calculations of the proportions of face-to-face contacts in each of the subgroups of treatment duration in this sample.

For analyses, STATA statistical software version 14 (Statacorp, College Station, Texas, USA), and SPSS version 20.0 for Windows (SPSS Inc., Chicago, III, USA) were used.

RESULTS

PATIENT CHARACTERISTICS

In the period from January 2010 until June 2011 3,814 patients started treatment; 2,286 with a primary depressive disorder and 1,528 with a primary anxiety disorder. In patients with a depressive disorder, the mean age was 46.5 years (SD 17.3) and 59.4% was female. In patients with an anxiety disorders, the mean age was 38.4 years (SD 15.9) and 64.1% was female (Table 1).

Number of face-to-face contacts

For depressive disorders, 2,286 patients accounted for a total of 113,459 face-to-face contacts (Table 2). Of these, 600 patients (26.2%) had a treatment duration of 24

months or longer, who accounted for 70,919 (62.5%) of all face-to-face contacts. For 530 patients (23.2%) treatment had not yet ended at the closing date of the study; minimum treatment duration for those patients was at least 24 months or longer.

For anxiety disorders, 1,528 patients accounted for a total of 57,841 face-to-face contacts. Of these, 336 patients (22.0%) had a treatment duration of 24 months or longer, who accounted for 32,207 (54.7%) of all face-to-face contacts. For 289 patients (18.9%) treatment had not yet ended at the closing date of the study.

The disproportionate number of face-to-face contacts in patients with longer treatment duration both in depressive and anxiety disorders is illustrated graphically in Figure 1.

TABLE 1. *Patient characteristics of patients with a depressive disorder (n = 2,286) and anxiety disorders (n = 1,528); stratified per duration of treatment duration.*

	Depressive disorders					
	< 6 months (N = 707)	6-12 months (N = 426)	12-18 months (N = 278)	18-24 months (N = 275)	> 24 months (N = 600)	Total (N = 2,286)
Mean age (SD)	46.7 (17.7)	45.8 (16.3)	45.7 (17.0)	46.0 (17.3)	46.1 (16.2)	46.5 (17.3)
Female sex N (%)	412 (58.3)	260 (61.0)	162 (58.3)	167 (60.7)	357 (59.5)	1,358 (59.4)
	Anxiety disorders					
	< 6 months (N = 495)	6-12 months (N = 326)	12-18 months (N = 222)	18-24 months (N = 149)	> 24 months (N = 336)	Total (N = 1,528)
Mean age (SD)	40.6 (17.0)	37.4 (15.5)	36.2 (15.0)	38.2 (16.5)	37.8 (14.3)	38.4 (15.9)
Female sex N (%)	318 (64.2)	207 (63.5)	141 (63.5)	101 (67.8)	212 (63.1)	979 (64.1)

TABLE 2. *Number of face-to-face contacts. Expressed in the total numbers of face-to-face contacts per subgroup of total treatment duration.*

	Depressive disorders					
	< 6 months (N = 707)	**6-12 months (N = 426)**	**12-18 months (N = 278)**	**18-24 months (N = 275)**	**> 24 months (N = 600)**	**Total (N = 2,286)**
face-to-face contacts	6,069	9,856	9,846	16,769	70,919	113,459
	Anxiety disorders					
	< 6 months (N = 495)	**6-12 months (N = 326)**	**12-18 months (N = 222)**	**18-24 months (N = 149)**	**> 24 months (N = 336)**	**Total (N = 1,528)**
face-to-face contacts	3,522	7,072	7,601	7,439	32,207	57,841

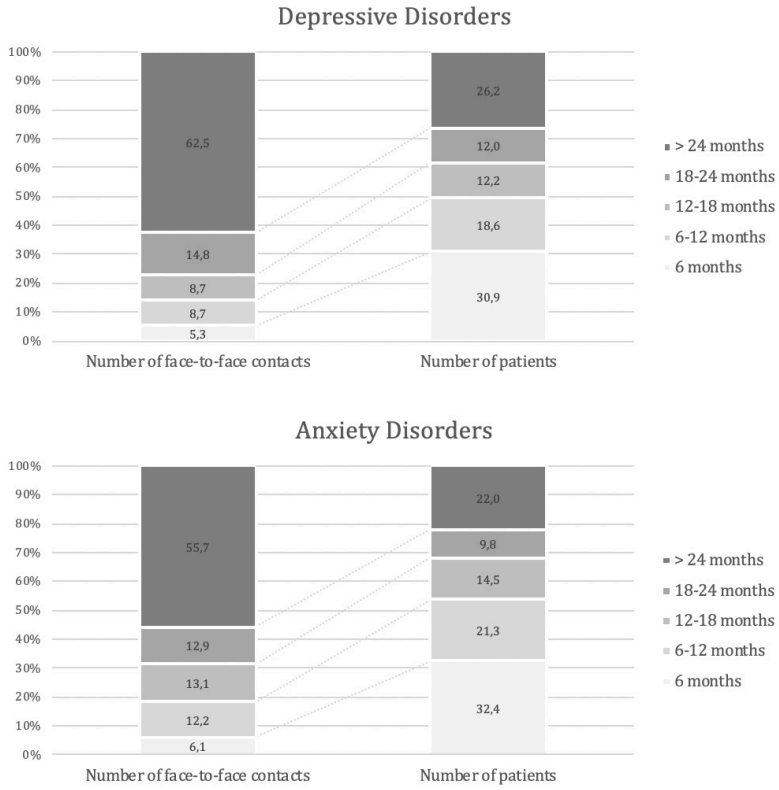

FIGURE 1. *Proportion of healthcare resource utilization in clinical practice.*

Contact density

Contact density, stratified in subgroups of treatment duration is shown in Figure 2. Contact density gradually decreased over time for all treatment durations, except for patients with a treatment duration of 24 months or longer. Table 3 shows the mean difference in contact density, relative to patients with a treatment duration longer than 24 months. For example, for patients with a depressive disorder, the mean difference of 9.1 in the (upper) second column means that patients with a treatment duration of 6-12 months have on average 9.1 (CI95 6.1,11.6) less face-to-face contacts in the first 6 months of treatment, compared to patients with a total treatment duration of 24 months or more. Both for depressive and anxiety disorders, contact density was significantly lower in all six months periods in the subgroups with a treatment duration of less than 18 months as compared to a treatment duration of 24 months or more. For depressive disorders, the difference was significant for the subgroup with total treatment duration of 18-24 months, starting at 6-12 months' time in treatment. For

anxiety disorders, the difference was significant for the subgroup with total treatment duration of 18-24 months, for 12-18 months' time in treatment only.

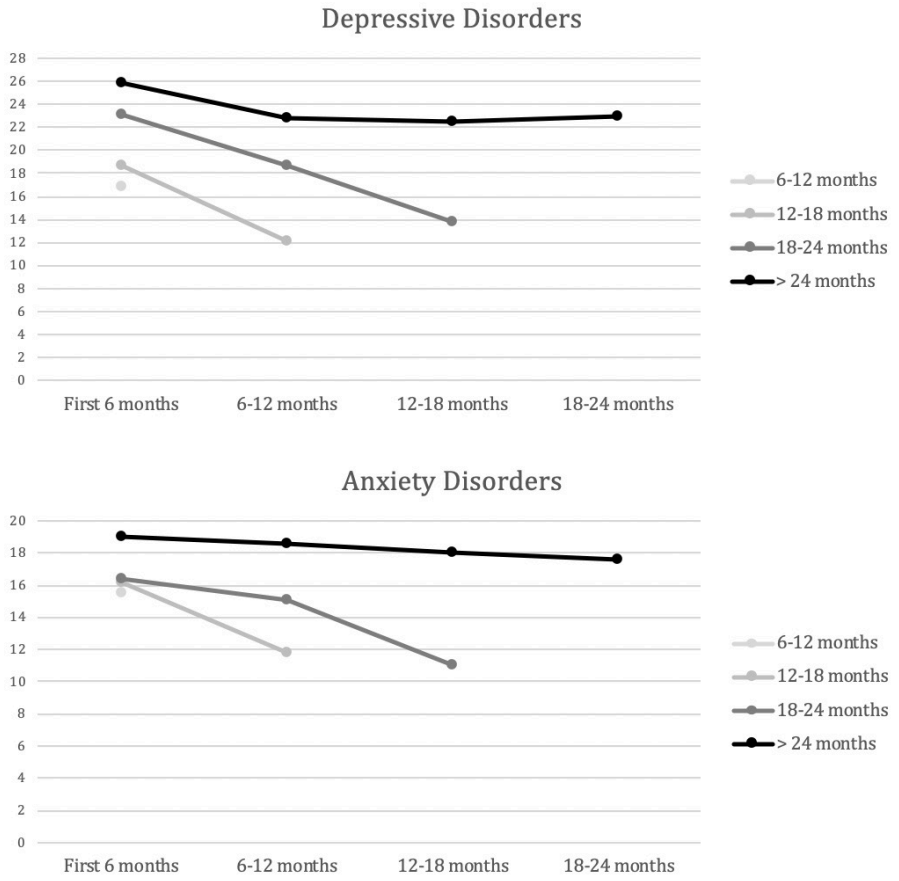

FIGURE 2. *Mean number of face-to-face contacts per patient stratified per six months of total treatment duration. The x-axis represents the period in treatment (e.g. first six months of treatment). The color of the lines shows the total treatment duration.*

Sensitivity analysis

In the first six months of the inclusion period 1,265 patients started treatment, 770 with a primary depressive disorder and 495 with a primary anxiety disorder (*see the online supplement for full details, appendix 1).* The proportion of patients withdrawn alive improved from 23.2% to 17.9% for depressive disorders, and from 18.9% to 17.2% for anxiety disorders; minimum treatment duration for those patients withdrawn alive

in this sensitivity analysis was at least 36 months. The proportion of patients with a treatment duration longer than 24 months in this smaller sample was similar to the total sample: 25.3% and 26.2% for depressive disorders and 23.6 and 22.0% for anxiety disorders, respectively. The proportion of contacts accounted for by patients with treatment duration longer than 24 months increased from 62.5% to 66.9% for depressive disorders and from 54.7% to 58.2% for anxiety disorders.

TABLE 3. *Mean differences (95% confidence interval) in contact density of face-to-face contacts, relative to patients with a treatment duration longer than 24 months.*

DEPRESSIVE DISORDERS

	Time in treatment →					
Total treatment duration ↓	First 6 months	p-value	6-12 months	p-value	12-18 months	p-value
6-12 months	9.1 (6.7,11.6)	< 0.001	-		-	
12-18 months	7.2 (4.5,10.0)	< 0.001	10.6 (8.1,13.0)	< 0.001	-	
18-24 months	2.8 (-0.8,6.4)	0.126	4.0 (0.7,7.4)	0.019	8.7 (6.1,11.4)	< 0.001

ANXIETY DISORDERS

	Time in treatment →					
Total treatment duration ↓	First 6 months	p-value	6-12 months	p-value	12-18 months	p-value
6-12 months	3.5 (1.0,6.0)	0.007	-		-	
12-18 months	2.9 (0.5,5.4)	0.021	6.8 (4.0,9.6)	<0.001	-	
18-24 months	2.7 (-0.5,5.6)	0.102	3.5 (-0.6,7.6)	0.093	7.0 (4.0,10.1)	< 0.001

DISCUSSION

In this cohort of psychiatric outpatients with a depressive or an anxiety disorder, we demonstrate that a limited proportion of patients with treatment duration longer than 24 months utilized a substantial proportion of mental healthcare resources. This was not only due to the longer duration of the treatment, but also due to the contact density per six months. When stratified according to treatment duration, contact density gradually decreased over time for all patients, with the exception of patients with a treatment duration longer than 24 months. Higher health resource utilization is not merely a function of treatment time; it is also due to a higher density of face-to-face contacts over the entire time of treatment.

Our finding of a disproportionate impact on resources by a minority of patients in mental health care has been abundantly demonstrated in previous studies.[7-8,13-16] In a review of 72 studies Kent et al.[7] concluded that in most studies, 10-30% of the patients identified as heavy users, accounted for 50 to 80% of mental healthcare resource utilization. Our

findings specifically confirm these findings for outpatients with depressive or anxiety disorder, which was not unexpected for prolonged duration of treatment. Our findings on contact density, however, have not been reported before. These findings suggest that a prolonged duration of treatment is already foreshadowed in an increased intensity of treatment early in the trajectory. The subsequent lack of tapering of contact density may serve as a further indicator for prolonged duration of treatment and a disproportionate impact on resources. From an earlier study in the same population, we know that longer treatment trajectories were predicted early in treatment by high ratings on the Brief Symptom Inventory, a multidimensional checklist of psychological symptoms. This indicates that these patients most likely have more severe disorders and/or more complexity due to co-morbidity.[10] Additionally, co-morbid personality disorders added to the prediction of longer duration of treatment for depressive disorders and age (>40 year) added to the prediction for anxiety disorders. Higher contact density is likely to be explained to some extent by such factors, especially early on in treatment.[17-21] Still, high contact density in general and the lack of any tapering of density over time could perhaps contribute clinically as additional indicators of prolonged treatment. One study, in an entirely different health domain, suggests that just the awareness by the treatment staff of a potential negative outcome may contribute to improve outcome.[22]

A strength of our study is that it is based on an integral set of administrative data for an entire region in a natural setting, with sufficient information to conduct a minimum of two-year follow-up. Although we cannot be sure that findings will generalize to other settings, our findings of disproportionate utilization of resources by a minority of patients, is clearly in line with previous studies, as mentioned before.

The main limitation of our study is that it involved administrative data only and the data were not collected for the purpose of this study. However, as our data are part of the reimbursement system, that is meticulously monitored, we believe the data do reflect the actual duration and density of treatment.[23,24] Also, from previous studies in GGZ Rivierduinen, we have some insight in the type a treatment that is provided.[25] Depressive disorders are more frequently treated with pharmacotherapy (55%) than psychotherapy (24%), while this is the reverse for anxiety disorders (23% and 59%). For both conditions, the remaining minority is treated with combinations or with other treatments. Guideline adherence in early stages of treatment was good in general, but less so for prolonged trajectories. Unfortunately, however, in depth information about patient characteristics, treatment details and specified outcomes was not available. As a consequence, it remains unclear to what extent the continued and disproportionate treatment effort added value to the outcome of these potentially complex patients.

Further research is clearly implicated. Another limitation is that treatment was still ongoing in our cohort at the closing date of the study. As a consequence, we will have underestimated the treatment effort involved in the longest trajectories. To estimate the potential impact of this unobserved treatment time, we conducted a sensitivity analysis for a shorter inclusion period of six months and thereby a longer follow-up of three years. The proportion of patients with unobserved time decreased from 23.2 to 17.9% for depressive disorders and from 18.9% to 17.2% for anxiety disorders. Apparently, many of the patients withdrawn from observation after two years were still in treatment after three years. This further underlines that the finding as reported should be considered as a minimum estimate for the impact of prolonged treatment on mental health resources.

In conclusion, we confirmed that in psychiatric outpatients the minority of 26% (depressive disorders) and 22% (anxiety disorders) of patients with a treatment duration longer than 24 months utilized more than 63% and 55% of treatment resources respectively. Contact density per six months remained high for these patients over the entire duration of treatment. Further research of the added value of these disproportionate treatment efforts to the outcome of these potentially complex patients is clearly implicated.

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ONLINE SUPPLEMENT. APPENDIX 1.

Our final sample included 719 patients (19%) with a treatment duration of at least 24 months of treatment, who were still in treatment at the end of follow-up (withdrawn alive). Therefore, we performed a sensitivity analysis in order to reduce the number of patients withdrawn alive and thereby increase the number of end-to-end treatment durations. As a sensitivity analysis we shortened the inclusion period by selecting patients with a first face-to-face contact before June 2010 (instead of June 2011) and calculated the proportion of mental healthcare utilization by dividing the total number of face-to-face contacts per stratification period, by the total number of face-to-face contacts.

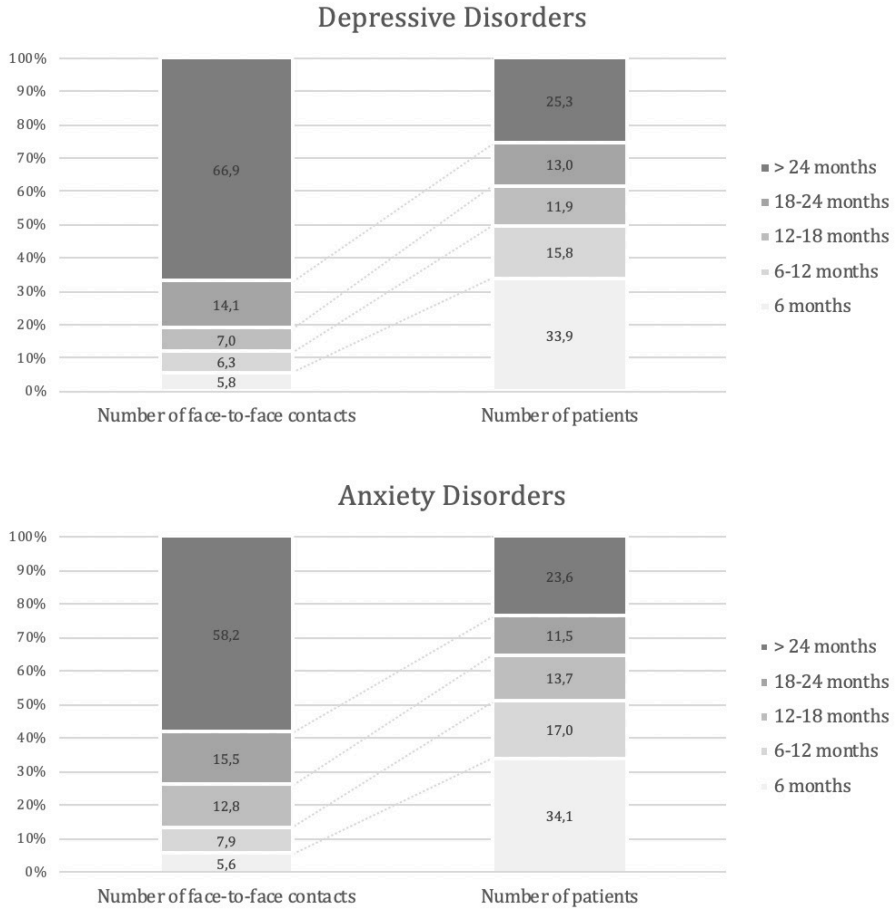

FIGURE 1. *Proportion of healthcare resource utilization in clinical practice.*