

Effectiveness of Community Mental Health Service in Oman: A Pilot Study

Saleha Al-Jadidi (1), Ahmed. S. Aboalatta (2), Iman Al-Rahbi (3), Maryyam Al-Harrasi (4)
Hamood AlRauzaiqi (3), Musa Abu Sabeih (5), Thuraiya AlGammari (3), Ahmed Al-Shammakhi (3)

(1) Consultant psychiatry and Geriatric AlMasarra Hospital, Ministry of Health, Sultanate of Oman. Education and faculty Member, Psychiatry Program, Oman Medical Specialty Board, Clinic Director SJMC Mind and Body Clinic, Sultanate of Oman

(2) Specialist psychiatry and Geriatrics, AlMasarra Hospital, Ministry of Health, Sultanate of Oman, Faculty member Psychiatry Program, Oman Medical Specialty Board

(3) Department of Nursing, AlMasarra Hospital, Ministry of Health, Sultanate of Oman

(4) Assistant Professor, College of Nursing, Sultan Qaboos University, Sultanate of Oman

(5) Nursing consultant, Directorate of nursing, Ministry of Health, Sultanate of Oman

Corresponding author:

Dr. Saleha Al-Jadidi

Email: saleha.aljadidi@moh.gov.om

Received: October 2021; Accepted: November 2021; Published: December 1, 2021.

Citation: Saleha Al-Jadidi et al. Effectiveness of Community Mental Health Service in Oman: A Pilot Study. World Family Medicine. 2021; 19(12): 69-79 DOI: 10.5742/MEWFM.2021.94180

Abstract

In Oman the Community Mental Health Service (CMHS) was implemented in 2013. CMHS includes home based services such as outreach team, including, crisis response, recovery team and rehabilitation. The community mental health program in Oman is multidisciplinary, however no study has yet evaluated the effectiveness of community mental health in Oman.

Aims: A pilot study was a weighted and measurable outcome of the community service program in decreasing relapse, length of hospital stay and the financial sequelae of relapse of the service provided.

Objective: was to compare readmission rate, length of stay and total hospital cost per admission for the patients before and after enrolment to the CMHS program.

Results: In this study there is a statistically significant difference between number of relapses before and after enrolments to community services. The mean number of relapses decreased after enrolment to CMHS and the decreases mean cost per admission for the patients after enrolment to the community program. Decrease in number of admissions among patients enrolled on CMHS was

from (M 2.68 SD 2.76) to (M 1.51 SD 2.5) with P value 0.001 . Duration of stay also decreased from (179.83 SD 471.2 day) to (61.62 SD 102.14 day) with P value approximately <P=0.01 indicating high statistical significance. which reflects also on the cost of care which dropped from (17900.83 SD 47100.2 OMR) to (6100.62 SD 10200.14 OMR). Further demographic variable results showed that males, illiterate, never been employed, single and divorced get benefits from CMHS and schizophrenia. < 10 years of illness and good family support got more benefits compared to other diseases

Conclusion: CMHS in Oman is effective in decreasing relapse rate and cost.

Key words: Community Mental Health Service, Oman

Introduction

Mental disorders are associated with a considerable burden of disease directly because of relative high estimates of prevalence, mortality, disabilities, and costs (WHO, 2004 and Baxter et al., 2011). Considering this serious burden, accurate and effective management has been believed to be an essential component of any mental health programs. However, most of the patients experience prolonged hospitalization and repeated readmissions that impose grave burden not just on a patients' quality of life, but on fragile financial resources of mental health programs (Botha et al., 2010).

After beginning of deinstitutionalization reform, clear changes happened in the strategy of mental health services. One of the essentials of deinstitutionalization reform is the principle of "continuity of care" (Bachrach, 1979). Body of evidence attests to the importance of aftercare programs for patients' continuity of care.

Regarding aftercare, different services have been designed to discuss possible solutions, such as intermediate settings ("step-down" services), residential treatment centres, or home-based facilities (Foster, 1999). Of the home-based services, case management, (Dieterich, et al., 2010) follow-up phone calls (Van den Berg et al., 2011) or home visits are the most common (Burns et al., 2002 and Sharifi, 2006).

A retrospective analytical study in Bahrain assessed the outcome of home visit in cases with schizophrenia, and revealed that there is reduction of hospital admission by 62% for those enrolled in community services. The effectiveness of Community mental health services is evidence based. Simmonds et al. 2001 in their systematic review, reported that community mental health team management is superior to standard care in promoting greater acceptance of treatment and may also reduce hospital admission and avoid deaths by suicide. This model of care is effective and deserves encouragement.

In addition, among older adults with mental illness Van Citters and Bartels (2004) concluded in their systematic review, that home-based mental health treatment is effective in improving psychiatric symptoms in older adults with home visits who didn't require admission at all (Houssein et al., 2009).

In Oman Dr. Saleha Al-Jadidi at AlMasarra Hospital implemented the Community Mental Health Service (CMHS) in 2013. CMHS included home based services such as outreach team, including, crisis response, recovery team and rehabilitation. Community mental health program in Oman is multidisciplinary. However, Nursing community services became a base of the services in visiting patients in their community (particularly in Muscat Governorate), two times per week, which has extended now to three times per week depending on the cases and types of medications used. Multidisciplinary teams depending on clinical needs of the patients are also involved in CMHS in Oman, including psychiatrists, consultant, specialists, nurses, medical officers, psychologists, social workers, clinical pharmacists, general practitioners, occupational therapists, physiotherapists, dietitians and medical orderlies (20,21). The service provides home based assessments, providing

medications or administering them, managing the cases and conducting investigations such as blood investigations (Saleha Al-Jadidi et al 2015).

CMHS in Oman showed effectiveness in reducing relapses and length of stay in the hospital etc. For better organization, Oman CMHS enrolled patients were divided into four phases from the implementation to date; phase one including chronic schizophrenia with / without long acting injections phase two other psychotic disorders (e.g severe schizoaffective disorder, and severe bipolar affective disorder. Phase three was for chronic major depressive disorder and phase four severe anxiety disorder which has not yet been reached. There are 54 cases that have been enrolled in CMHS so far.

In 2016, CMHS was expanded, and it became a National Program to include general psychiatry cases with the same inclusion and exclusions criteria (15). In order to follow progress of the patients the program was added to MOH A'shifa system (electronic file system) for all local regions, in order for any psychiatrist to refer to the mentioned program, however some regions are still under implementation.

Unit cost for AlMasarra Hospital, for inpatients is (148.2 RO). Unit cost is one for inpatient or inpatient curative care and one for "outpatient defined visit" for patient curative care. Curative care includes the cost of medical and paramedical staff, the agnostic services, both laboratory and imaging services, and medical goods that include prescribed medicines and nondurable and durable goods. Unit cost per bed day was estimated using an Ordinary Least Squares regression model developed by WHO-CHOICE and published by Adam et al. (2003). As per the WHO model, Al Masarra hospital is considered a Tertiary-level psychiatry hospital equipped with highly specialized staff and technicians; clinical services are highly differentiated by function; and have teaching activities. So, the unit cost would be relatively high compared to another regional hospital with different medical specialties. The formula below is used to calculate the unit cost for both inpatient and outpatient services

Unit Cost for Patient Services = Overhead Expenses + Capital Investments/Total Revenue per year

Hospital Costs per Bed Day on average cost every inpatient RO 148.2 per day during their stay in AlMasarra hospital. The cost of the medical and paramedical staff and providing curative care for one inpatient per day amounts to RO 111.3 (about 75.1 % of unit costs). Every inpatient costs RO 16.75 (8%) for medicine and RO 8.3 (5.6%) other medical goods; and costs RO 11.9 for diagnostic services, daily. The total length of stay for admitted patients in year 2019 was 25,774 service days (which cost MOH approximately RO 3,819,706 per year for total admitted patients) and the mean length of stay was 24.7 service days (which cost MOH approximately around RO 3,660 per single patient year). Unit Cost for each inpatient service day Item Percentage was Prescribed Medicine 11.3% Imaging Services 1.7% Laboratory Services 6.3% Non-durable and durable Goods 5.6% Salaries 75.1 %.

Hospital Costs per Patient Visit at AlMasarra hospital which accommodates more than 25,774 outpatients visit (in 2019):

Each outpatient visits costs on average 86.3. Costs for medical and paramedical staff make the most of this cost (RO 58.9 or 68.2 %). On average, each outpatient visit costs RO 12 of medicine, the rest of the cost goes to diagnostic services. The approximate cost of patient visits in 2019 was RO 2,224,296 (Prescribed Medicine 13.9 %, Imaging Services 3.5 %, Laboratory Services 6.3% ,Non-durable and durable Goods 8.1 %, Salaries 68.2 %).

Methods

A retrospective analysis was done of the data from January 2015 to January 2020 on A'Shifa system of community mental health service and community mental health documents before A'Shifa system implementation for all CNHS patients (54 comprehensive patients were enrolled), who were in CMHS at Al Masarra Mental Hospital, Oman, for the mentioned period.

The study hypothesis was that CMHS, improves the patients' outcome.. (The current unit cost for AlMasarra Hospital, for inpatients is (148.2 RO). The aim was to study the positive outcome of the community service program in Oman in decreasing relapse and the financial sequelae of relapse and the service provided. The objectives of this study, were to compare the relapse rate of hospital admission/per relapse and total hospital cost per admission for the patients before and after the enrolment to the CMHS program.

Inclusion criteria was to enrol all patients enrolled in CMHS (age 18+, chronic mental illness with/without long acting injections Exclusion criteria any mental illness not enrolled in the program which are (substances misuse disorders, personality disorders, pure social problems, forensic cases and severe dysfunction of family dynamic). This study was approved by the Directorate of Health Services Muscat governorate , MOH , Oman research ethics committee.

Data analysis

Statistical Package for Social Science program (SPSS, Inc., USA) V 25 was used for statistical analysis. For quantitative variables, mean and standard deviation (mean \pm standard deviation) were calculated. For qualitative variables, frequency and percentage n (%) were described.

Wilcoxon test was used to compare between variables before and after the program. P-values were considered significant when P-value <0.05.

The data was analysed by comparing the outcome measures (the relapse rate, readmission rate, duration of hospital admission/per relapse, severity of episodes, total hospital cost per admission for the patients) after enrolment to CMHS from January 2015 to January 2020 and before the enrolment of the services, using SPSS version 20.

Results

In this pilot study we examined the effectiveness of community interventions among a sample (n=54) of psychiatry patients at A-Masarra Hospital (Table 1). Participants in the study were relatively young, mean age 47.87(SD =11.33). Our sample consisted mostly of male patients (72 %). There was

a heterogeneity of the sample in terms of duration of illness. The majority of the sample was illiterate 53%, and 7% of them have education level to grade 6 , and 6% have education grade 7,8,9,10 and 12 and 2 % had education level of grade 2,5 and 11 (Figure 1). Most of the patients were living in an urban area (69%) and 31% were rural. Most of the study sample were single 59%, 19% were divorced and 13% were married. Most of the patients were unemployed (67%) and 4% were retired (Figure 2).

In terms of clinical characteristics most of the sample had schizophrenia (61.11%) and 16.67% had schizoaffective disorder. In addition, the minimum duration of illness was 2 years and maximum was 45 years, mean 21.75 (SD =10.31) (Table 3).

There is a statistically significant difference between number of relapses before and after enrolment to community services interventions; the mean number of relapses decreased after enrolment to community services interventions (2.68 \pm 2.76 Vs. 1.51 \pm 2.50 ; P = 0.001) using a significance level of 0.05. The mean days of hospital admission/per relapse after enrolling in the program CMHS were less than the mean days before enrolling in the program (179.83 \pm 471.2 Vs. 61.62 \pm 102.14; P = 0.00), also the mean cost per admission for the patients after enrolment to the program CMHS was less than the mean cost per admission before enrolment to the program CMHS intervention (17900.83 \pm 47100.2 Vs. 6100.62 \pm 10200.14; P = 0.00), using significance level of 0.05 (Table 2) .

These results suggest number of hospital admissions decreases with CMHS. We also found that, there was a significant difference in costs of care before and after the community program. Statistically our results suggest that when psychiatry patients get community care visits, the cost of care decreases in comparison with not getting community care. The cost dropped tremendously after 2 years from adopting the CMHS to a mean 6100.62 OMR in comparison to mean OMR 17900.83 before enrolment.

And second analysis showed (Table 5) 35 (68%) of patients were diagnosed with schizophrenia and 7(13%) diagnosed with Schizoaffective disorder. 31 (57%) of the study population don't have a psychiatric condition and 41 (76%) of them don't have a medical condition. The mean duration of illness is about 21 years. 34 (65%) of participants had family support. Schizophrenia patients got benefit from the program while patients with other diagnoses didn't benefit from the program, Only patients with no medical and hypertensive condition got benefit from the program but patients who had diabetes mellitus, substance misuse, hypertension & diabetes mellitus, Hypertension & epilepsy, and HCV did not get benefit from the program. Also patients with no psychiatric disorder got benefit from the program. Patients who had a duration of illness less than 10 years got benefit from the program in terms of the duration of hospital admission/per relapse and cost per admission but they didn't get benefit in the number of relapses. Patients who had a duration

of illness greater than ten years got benefit from the program in the number of relapses, duration of hospital admission/per relapse and cost per admission. Patients with family support and those without family support got benefits from the program using a significance level of 0.05 (Table 4).

(Table 4) shows that males got benefits from the program while females didn't get benefits from the program. According to education level, only illiterate patients got

benefit from the program while the differences in other education levels are not statistically significant. According to occupation, patients who were never employed and who were retired got benefits from the program while patients currently employed and housewives didn't get benefits from the program. Single and divorced patients got benefits from the program but married and widowed patients didn't get benefits from the program. Both urban and rural residents got benefit from the program, using a significance level of 0.05.

Figure 1: Distribution of Education level

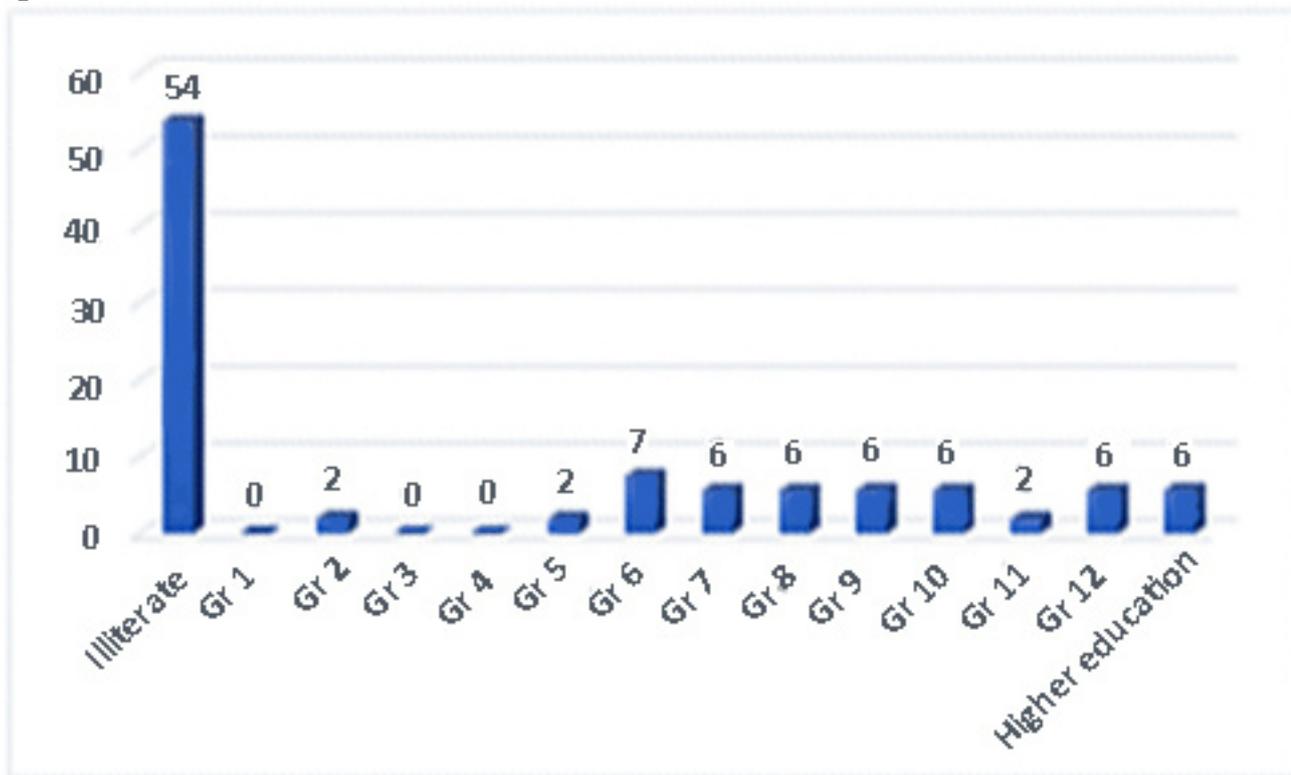


Figure 2: Distribution of occupation

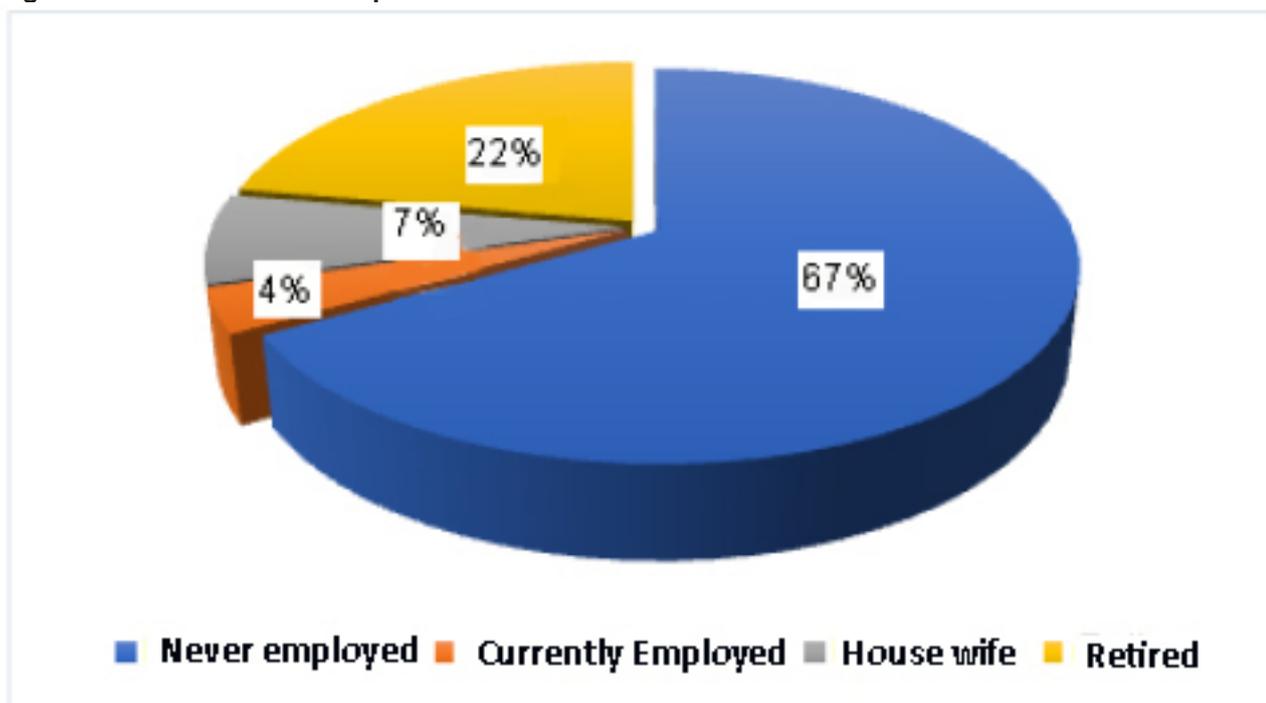


Table 1: Patients' characteristics

Variable	N	%
Sex		
Male	39	72%
Female	15	28%
Education level		
Illiterate	29	53.7%
Gr 2	1	1.9%
Gr 5	1	1.9%
Gr 6	4	7.4%
Gr 7	3	5.6%
Gr 8	3	5.6%
Gr 9	3	5.6%
Gr 10	3	5.6%
Gr 11	1	1.9%
Gr 12	3	5.6%
Higher education	3	5.6%
Occupation		
Never employed	37	67%
Currently employed	2	4%
House wife	4	7%
Retired	11	22%
Marital status		
Single	32	59%
Married	7	13%
Divorce	10	19%
Widow	5	9%
Residence		
Urban	37	69%
Rural	17	31%
Age		
Mean \pm SD	47.87 \pm 11.33	
Minimum	29	
Maximum	74	

Table 2: Comparison between No. of Relapses, duration of hospital admission/per relapse, and total cost per admission for the patients before and after the enrolment to the program CMHS

	Before enrolling in community services interventions (Mean ± SD)	After enrolling in community services interventions (Mean ± SD)	P-value
No of Relapses	2.68 ± 2.76	1.51 ± 2.50	0.001
Duration (Days)	179.83 ± 471.2	61.62± 102.14	0.00
Cost (RO)	17900.83 ± 47100.2	6100.62± 10200.14	0.00

Table 3: Clinical characteristics

Diagnosis	Mean (SD)	Frequency & Percentage (N, %)
Mental Retardation		2 (3.7)
Schizophrenia		33 (61.1)
Schizo Affective Disorder		9 (16.7)
Frontotemporal Dementia		1 (1.9)
Bipolar Affective Disorder		6 (11.1)
Delusional Disorder		3 (5.6)
Duration of Illness	21.75 (10.31)	

Table 4: Comparison between the number of relapses, duration of hospital admission/per relapse, and cost per admission for the patients before and after enrolling in the program according to demographic variables

Variable	No of Relapses		P	Duration (Days)		P	Cost (RO)		P
	Before	After		Before	After		Before	After	
Sex									
Male	2.58 ± 2.32	1.30 ± 2.00	0.002	144 ± 152	53 ± 89		14400 ± 15200	5300 ± 8900	0.00
Female	2.93 ± 3.76	2.00 ± 3.05	0.145	336 ± 865	81 ± 131		33600 ± 86500	8100 ± 13100	0.162
Education Level									
H	1.33 ± 0.57	0.66 ± 1.15	0.414	55 ± 59	14 ± 24		5500 ± 5900	1400 ± 2400	0.109
Illiterate	2.82 ± 3.27	1.53 ± 2.04	0.010	271 ± 642	65 ± 101		27100 ± 64200	6500 ± 10100	0.00
Gr2	10 ± -	1 ± -	-	434 ± -	17 ± -		43400 ± -	1700 ± -	-
Gr5	1.00 ± -	13.0 ± -	-	147 ± -	397 ± -		14700 ± -	39700 ± -	-
Gr6	3.00 ± 2.00	00 ± 00	0.059	78 ± 54	00 ± 00		7800 ± 5400	00 ± 00	0.063
Gr7	3.33 ± 0.57	4.00 ± 3.6	0.785	127 ± 23	161 ± 154		12700 ± 2300	16100 ± 15400	0.593
Gr8	2.33 ± 1.15	1 ± 0	0.175	86 ± 63	49 ± 7		8600 ± 6300	4900 ± 700	0.285
Gr9	2.33 ± 1.15	2.00 ± 1.14	0.99	83 ± 33	87 ± 53		8300 ± 3300	8700 ± 5300	0.665
Gr10	0.33 ± 0.57	0 ± 00	0.317	115 ± 200	00 ± 00		11500 ± 20000	00 ± 00	0.317
Gr11	3.00 ± 0.41	4 ± -	-	233 ± 185	233 ± 185		23300 ± 18500	23300 ± 18500	-
Gr12	2.66 ± 2.51	00 ± 00	0.180	99 ± 88	00 ± 00		9900 ± 8800	00 ± 00	0.180
Occupation									
Never employed	2.63 ± 2.55	1.60 ± 2.79	0.006	257 ± 591	71 ± 114		25700 ± 59100	7100 ± 11400	0.001
Currently Employed	1.50 ± 2.12	0.00 ± -	-	83 ± 118	0.00 ± -		8300 ± 11800	0.00 ± -	-
Housewife	5.25 ± 4.92	3.00 ± 2.44	0.273	135 ± 131	109 ± 150		13500 ± 13100	10900 ± 15000	0.518
Retired	2.41 ± 2.64	0.58 ± 0.66	0.015	108 ± 124	18 ± 21		10800 ± 12400	1800 ± 2100	0.008
Marital Status									
Single	2.56 ± 2.04	1.87 ± 2.95	0.038	166 ± 173	81 ± 115		16600 ± 17300	8100 ± 11500	0.003
Married	2.57 ± 3.55	0.28 ± 0.48	0.072	106 ± 168	4 ± 7		10600 ± 16800	400 ± 700	0.075
Divorced	4.20 ± 4.13	1.70 ± 1.88	0.016	455 ± 1044	65 ± 99		45500 ± 104400	6500 ± 9900	0.028
Widow	0.6 ± 0.51	0.60 ± 1.34	0.98	32 ± 45	8 ± 19		3200 ± 4500	800 ± 1900	0.285
Residence									
Urban	2.62 ± 2.70	1.56 ± 2.68	0.011	154 ± 169	67 ± 110		15400 ± 16900	6700 ± 11000	0.002
Rural	2.82 ± 2.98	1.41 ± 2.12	0.018	292 ± 810	48 ± 81		29200 ± 81000	4800 ± 8100	0.002

Table 5 shows that just Schizophrenia patients got benefit from the program while patients with other diagnoses didn't get benefit from the program and Patients with family support and those without family support got benefits from the program using significance level of 0.05

Variable	N (%)	No of Relapses		P	Duration (Days)		Cost (RO)		P
		Before	After		Before	After	Before	After	
Diagnosis									
Schizophrenia	35 (65)	2.62±2.4	1.71±2.28	0.005	1.55±172	70±109	1.5500±17200	700±10900	0.001
Schizoaffective disorder	7 (13)	1.57±1.2	1.00±1.82	0.391	63.14±63.21	48±114	6300.14±6300	4800±11400	0.499
Frontotemporal dementia	1 (2)	11.00 ± -	3.00 ± -	-	3409.0 ± -	112 ± -	340900.0 ± -	11200 ± -	-
Bipolar affective disorder	5 (9)	2.80±4.0	0.8±1.30	0.375	118.00 ±181	12±1	11800 ±18100	1200±100	0.144
Delusional disorder	4 (7)	3.25±4.0	1.25±1.50	0.285	110.0±79.76	25±30	11000±7900.76	2500±3000	
Mental retardation	2 (3)	2.0±1.41	1.50±2.21	0.655	179.00±148	120±169	17900±14800	12000±16900	0.180
Comorbid Condition : Medical									
No	31 (57.0)	2.70±2.6	1.87 ±2.88	0.022	129 ±134	80 ±120	12900 ±13400	800 ±12000	0.001
Substance misuse	1 (1.9)	3.00 ± -	0 ± -	-	126 ± -	0 ± -	12600 ± -	0 ± -	-
Hypertensive	7 (13)	3.14±3.8	1.14 ±1.87	0.047	1262±477	41 ± 69	126200±47700	4100 ±6900	0.028
Diabetes mellitus	4 (7.4)	1.75±1.7	0.5 ±1.0	0.285	102 ±1	10 ±21	10200 ±100	1000 ±2100	0.109
HCV	1 (1.9)	4.00 ± -	7.00 ± -	-	0 ±0	177±-	0 ±0	17700±-	-
Hypertensive / Diabetes mellitus	9 (16.4)	2.33±3.3	0.33 ±0.5	0.051	0 ±0	12 ±21	0 ±0	1200 ±2100	0.063
Hypertensive / Epilepsy	1 (1.9)	4.00 ± -	4.00 ± -	-	0 ±0	219 ±-	0 ±0	21900 ±-	-
Comorbid Condition : Psychiatric									
No	41 (76.0)	2.63±2.7	1.14 ±1.83	0.00	221 ±536	51 ± 91	22100 ±53600	5100 ± 9100	0.00
Substance misuse	4 (16.6)	3.22±2.9	3.33 ±2.44	0.672	148 ±133	86 ±106	14800 ±13300	8600 ±10600	0.374
Mental retardation	2 (7.4)	2.0±2.70	3.50 ±6.30	0.854	68 ±70	112 ±191	6800 ±7000	11200 ±19100	0.715
Duration of illness / Year									
0-10 years	7 (13)	1.57±1.2	0.42 ±0.78	0.113	86 ± 66	13 ± 23	8600 ± 6600	1300 ± 2300	0.046
11-20 years	21 (39)	3.±2.56	2.064 ±2.26	0.050	143 ±161	81 ± 94	14300 ±16100	8100 ± 9400	0.008
> 20 year	26 (48)	2.73±3.1	1.38 ±2.89	0.022	271 ±661	58 ± 118	27100 ±66100	5800 ±11800	0.006
Family Support									
Yes	35 (64.8)	2.14±2.4	0.85 ±1.51	0.005	103 ±133	35 ± 67	10300 ±13300	3500 ±6700	0.00
No	19 (35.2)	3.68±3.1	2.73 ±1.41	0.049	371 ±755	109 ±135	37100 ±7500	10900 ±13500	0.024

Discussion

This retrospective pilot study showing the effectiveness and superiority of Community Mental Health Service (CMHS) implemented at AMH, Oman, (Saleha Al-Jaddi et al 2015) concerns the relapse rate, duration and total hospital cost per admission for the patients enrolled to CMHS. CMHS, includes home based services such as outreach team, early interventions, crisis response, recovery team and rehabilitation services adding to the usual after care services (Saleha Al-Jadidi, 2016).

A Retrospective analysis was done of the data collected between January 2015 to January 2020 on A'Shifa system of community mental health service and community mental health documents before A'Shifa system implementation for all patients. A total of 54 patients were enrolled in the study representing ages between 29-74 years; 39(72%) were male and 15(28%) were female and most of them were singles with various residency, occupation and educational level. Unit cost per day was estimated using ordinary least regression model developed by WHO-CHOICE. Al Masarra hospital is considered a tertiary level psychiatry hospital so the unit cost is considered to be high compared to the other medical health facilities. On average every inpatient cost 148.2 OMR per day during their stay with approximately 75% of the cost providing curative care and other cost provided medications, other medical goals and diagnostic services.

To our knowledge, this is the first retrospective pilot study of the evidence that supports CMHS outreach service models using standardized inclusion and evaluation criteria in Oman.

We found that there was a significant decrease in number of admissions among patients enrolled on CMHS from (M 2.68 SD 2.76) to (M 1.51 SD 2.5) with P value 0.001. We also found that duration of stay also decreased from (179.83 SD 471.2 per day) to (61.62 SD 102.14 per day) with P value approximately 0.00 indicating high statistical significance, which is reflected also in the cost of care which dropped from (17900.83 SD 47100.2 OMR) to (6100.62 SD 10200.14 OMR). This result is congruent with our hypothesis reflecting on decreased relapse rate, length of stay and the financial impact of relapse of the service provided. Our results are in agreement with results of Houssein et al, 2009 who compared patients who are diagnosed with Schizophrenia enrolled to Community Psychiatry Service – Home Visit Treatment [CPS-HVT] vs outpatient treatment in Bahrain and concluded that CPS-HVT is superior and reduces the number and duration of admissions. Van Citters and Bartels, 2004 concluded that outreach services may provide an essential bridge that connects effective pharmacologic and psychosocial interventions with individuals however they also stated that limited data supported the effectiveness of outreach services in identifying isolated older adults with mental illness and recommended that we need more rigorous methods evaluating the efficacy of case identification models and subsequent treatment for older persons with

a variety of psychiatric diagnoses. Simmond et al 2001 stated that Community mental health service is superior to standard care in promoting acceptance of treatment, and may reduce hospital admission and they recommended after a systematic review that this model of care is effective and deserves encouragement. Gillis, Koch and Jovi, 1990 investigated the cost effectiveness of the home visiting program for psychiatric patients at Valkenberg Hospital, Cape Town. Their results showed that readmissions were reduced by 31.5% over 1 year and duration of days in hospital by 55.6%. Moreover attendance at outpatient clinics also improved by 39%. The cost-effectiveness was clearly demonstrated. The same was found by T Burns, et al.

There is evidence that visiting patients in their home regularly and taking responsibility for both health and social care each reduces days in hospital. We believe that factors behind successful CMHS are multiple and overlap with each other and depends on service providers and consumers of the service. Poor compliance and difficulties in reaching/obtaining the service is the main goal behind CMHS as one of the feasible goals of aftercare protocols. Patient related and disease related factors could strongly influence medication compliance which reflects directly on readmission rate and cost effectiveness which could be easily overridden by delivering the service to the patient in certain circumstances and with certain criteria.

Therefore, another deeper analysis of the result was conducted to investigate the effectiveness of patient related (demographical factors) on CMHS and then the factor related to the disease itself. We compared the number of relapses, duration of hospital admission/per relapse, and cost per admission for the patients before and after enrolling into CMHS according to demographic variables. The results show that males got more benefits from CMHS, and illiterate patients got benefit while the differences at education levels are not statistically significant; patients who had never been employed and who were retired were got more benefits from CMHS compared with those who were currently employed and housewives; single and divorced patients got benefits compared to married and widowed and both urban and rural got benefit from the program, using a significance level of 0.05. We believe that those results are multifactorial and possible interaction between all demographical factors rather than single implemented factors. At that level of study, we were not able to investigate each demographic factor alone and it was difficult to neutralize other demographics at the same time however, we found that our primary results may give the chance for later deeper investigation on a larger community sample. We also believe that those findings will help mental health policies makers to design the future community mental health program based on the characteristics of the population (Demographic variables) in order to reduce untreated patients and optimize resources. Our aim and results are in disagreement with the study conducted in different population (Korea) and different target sample for Park et al 2014 who investigated Sociodemographic factors associated with the use of mental health services

in depressed adults. He found that employed patients and educational level got more benefit from the service. Different communities may explain the difference in results. We also compared the number of relapses, duration of hospital admission/per relapse, and cost per admission for the patients before and after enrolling to CMHS according to the disease related factors and the results show that Schizophrenia patients, patients who had a duration of illness less than 10 years and patients with family support got more benefits from the program using a significance level of 0.05. Our results are in concordance with Piat et al, 2011, who investigated the importance of families for persons with serious mental illness living in structured community housing and they found that families supported recovery by providing affection and belonging, and offering emotional and instrumental support.

We conclude that CMHS is very crucial and superiorly effective to standardized after care plans which patients obtained before enrolling to CMHS and in decreased readmission rate, length of stay, and overall cost of the service, in Oman. Adding to that we observed that illiterate, never been employed and retired, single and divorced patients got more benefits. We also observed that Schizophrenia patients, patients who had a duration of illness less than 10 years and patients with family support got more benefits from CMHS.

This study has several important limitations. First, the small sample size was enrolled to study however we tried to enrol most of the patient enrolled to CMHS during the mentioned study time. Adding to that the CMHS was affected by the COVID 19 pandemic. Second, the lack of heterogeneity of sample residency which affects the ability to generalize the results. Therefore we recommend further studies on CMHS in Oman and further analysis of the result is needed.

Recommendations to higher authorities include: expanding the community mental health service to all levels of health care facilities, training health care providers, allocating a budget and focus on community mental health services rather than increasing beds at the hospitals and funding of future research.

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