



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

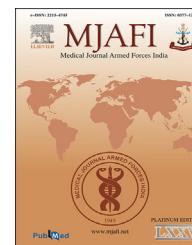
Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/mjafi

Correspondence/Letter to the Editor

Feasibility of tele-follow-up of chronic respiratory disease patients in a resource-limited setting of northern India during COVID-19 pandemic

Dear Editor,

The nationwide lockdown in response to the coronavirus disease 2019 (COVID-19) pandemic has reduced the accessibility of millions to non-COVID healthcare services across India, among which noncommunicable diseases patients form a major group. Hence, we tested a telemedicine follow-up cum consultation system for patients with chronic respiratory disease (CRD) identified through a population-based screening and assessed their treatment-seeking practices including, drug availability and accessibility, self-reported drug adherence, and disease control during the lockdown.

We conducted this cross-sectional study among patients (aged >12 years) registered with a CRD clinic at a secondary-care hospital in rural Haryana. Two teams, each comprising a trained health counsellor and a medical doctor, offered the follow-up consultation. All patients with valid telephone numbers were contacted and assessed by health counsellors as part of the tele-follow-up system (TFU), followed by teleconsultation (TFC) to patients with poor disease control. The TFU and TFC services were delivered during the lockdown period through voice calls or WhatsApp messaging, or videocall services. A pre-tested follow-up checklist (in Hindi) was used.

The Institute Ethics Committee approved the study protocol. The TFU and TFC services have been delivered after the informed consent from the participants adhering to all the guidelines laid down by the Government of India tailored to our settings.¹

Of the 289 registered patients with CRD clinic, 284 (98.3%) with valid phone numbers were contacted. Of them, 235 (82.7%) responded, and 221 (93.9%) patients consented. Of the 218 (98.8%) who completed the TFU services, 111 (50.9%) and 100 (45.9%) had asthma and chronic obstructive pulmonary disease (COPD), respectively. The median age of the CRD patients was 58.5 (12–98) years. The duration of the CRDs ranged from 2 months to 40 years. Other demographic, clinical and medication purchase-related characteristics during the lockdown are enumerated in [Table 1](#).

Poor drug adherence was reported among 71 (64.0%) and 61 (61.0%) patients with asthma and COPD, respectively. The most cited reasons for non-adherence were lack of symptoms

(50.8%) and use of the medications only when they were symptomatic (26.8%) ([Fig. 1](#)).

Among the 218 CRD patients, 193 (88.5%) reported that their disease was under control, while 25 (11.5%) expressed that their CRD was not under control or could not assess the control status. Of the 25 patients, 13 (52%) reported new symptoms during the lockdown period, and six of them consulted a hospital (4 government and 2 private). Seven (53.8%) of the 13 patients with new complaints had respiratory symptoms, and the majority (n=6) were advised to adhere to the prescription. One patient was referred to the nearest sub-district hospital for an electrocardiogram and further management.

Even though the utilization of telemedicine in CRD management has been reported, lack of regulatory guidelines for telemedicine in India before the COVID-19 pandemic, resource constraints, and digital literacy might have been few factors for the non-adoption of telemedicine services in a wider manner. Even though we tested the TFU service as a rapid alternative during the lockdown, we had a good response rate. The closure of non-essential services and poor access to the medical facilities during the lockdown could be a reason for a high acceptance rate of the TFU services. Furthermore, our TFU was simple, required minimal effort from the patients, and was initiated by the provider. However, the patients' satisfaction and problems while availing TFU need to be assessed in future studies.

In our study, most patients with asthma (64%) and COPD (61%) had poor adherence to therapy. We expected the lockdown to have contributed to the non-adherence. However, the inability to procure the drug or lack of access to medical facilities were the reasons for poor adherence in <20% of the subjects. Lack of perceived symptoms and adherence to therapy only when they felt symptomatic were the major reasons for non-adherence.² Our experience is similar to the previous studies on COPD, where the patients' symptom perception influenced compliance to medications.³ Our study participants might have experienced fewer symptoms during the lockdown period due to less exposure to the potential aggravating factors (occupational/environmental). However, under-reporting of symptoms cannot be ruled out. The reporting of CRD symptoms might have been precipitated by

Table 1 – Demographic and clinical characteristics of patients with CRDs who underwent Telephonic follow-up during COVID-19 pandemic in India.

Characteristics		Total N = 218 (%)	Asthma n = 111 (%)	COPD n = 100 (%)	CPA/ILD n = 7 (%)
Age	13–18 years	14 (6.4)	14 (12.6)	0 (0.0)	0 (0.0)
	19–60 years	110 (50.5)	71 (64.0)	36 (36.0)	3 (42.9)
	>60 years	94 (43.1)	26 (23.4)	64 (64.0)	4 (57.1)
Gender	Male	124 (56.9)	39 (35.1)	84 (84.0)	1 (14.3)
	Female	94 (43.1)	72 (64.9)	16 (16.0)	6 (85.7)
Locality	Semi-urban	114 (52.3)	63 (56.8)	48 (48.0)	4 (57.1)
	Rural	104 (47.7)	48 (43.2)	52 (52.0)	3 (42.9)
Recent hospital visit before lockdown	≤1 month	40 (18.3)	14 (12.6)	24 (24.0)	2 (28.6)
	>1 month	178 (81.7)	97 (87.4)	76 (76.0)	5 (71.4)
Co-morbidities	Hypertension	14 (6.4)	5 (4.5)	8 (8.0)	1 (14.3)
	Diabetes Mellitus	6 (2.8)	2 (1.8)	3 (3.0)	1 (14.3)
	Others*	3 (1.5)	2 (1.8)	1 (1.0)	0 (0.0)
Place of Purchase of CRD drugs during lockdown	Does not take drugs at all	71 (32.6)	36 (33.0)	32 (34.8)	3 (33.3)
	Made enough stock before lockdown	45 (20.6)	29 (26.6)	15 (16.3)	1 (14.3)
	Private chemist shop	35 (16.1)	21 (19.3)	12 (13.0)	1 (14.3)
	Did not purchase because of lockdown	29 (13.3)	14 (12.8)	13 (14.1)	1 (14.3)
	Govt dispensary/hospital	28 (12.8)	9 (8.3)	18 (19.6)	1 (11.1)
	Others	3 (1.4)	0 (0.0)	3 (3.2)	0 (0.0)

All are column percentages; *Hypothyroidism, Generalized allergic reaction, Bipolar disorder. COPD-Chronic Obstructive Pulmonary Disease; CPA-Chronic Pulmonary Aspergillosis; ILD-Interstitial Lung Disease.

the stigma associated with COVID-19. Even though the disease control can be assessed more objectively using spirometry, the procedure was stopped given the COVID-19 pandemic.

Patient education programs, effective communication between the patients and physicians, and the use of techno-

logies have been postulated as measures to ensure medication adherence, especially for chronic diseases.⁴ We tried to accommodate the aforementioned components in our TFU system when routine healthcare services were diverted towards COVID-19 management.

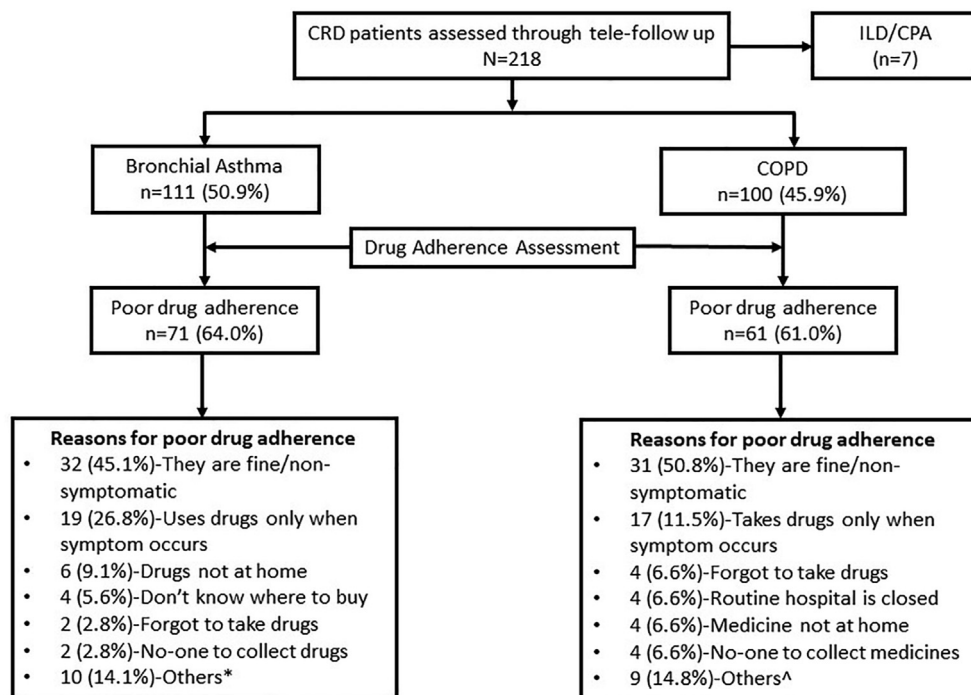


Fig. 1 – Adherence to medications among patients assessed through a telephonic follow-up system. COPD-Chronic Obstructive Pulmonary Disease; CPA-Chronic Pulmonary Aspergillosis; ILD-Interstitial Lung Disease. *Stopped due to other disease-3, Stopped by another doctor-3, Alternative therapy-1, Drug is costly-1, Dose was not available-1, Hospital was closed-1; ^Drug was costly-2, Chemist shop was closed-2, Drug was not available in hospital-1, No transport facility-1, Stopped due to other disease-1; Dose not available-1, Don't know where to buy-1.

In conclusion, telephonic follow-up for patients with CRD is a feasible alternative for assessing drug adherence and disease control in rural and semi-urban settings. Further studies on structured long-term follow-up based on objective assessment using telemedicine in low-resource settings are needed.

Acknowledgements

We acknowledge Indian Council of Medical Research (ICMR), New Delhi for the support as part of the grant no.5/8/4-4/COPD/2019-NCD 1.

REFERENCES

1. Ministry of Health and Family Welfare.. BOARD OF GOVERNORS *In Supersession of the Medical Council of India Telemedicine Practice Guidelines Enabling Registered Medical Practitioners to Provide Healthcare Using Telemedicine* [Internet]; 2020:48. Available from: <https://www.mohfw.gov.in/pdf/Telemedicine.pdf>.
2. Pinnock H, Steed L, Jordan R. Supported self-management for COPD: making progress, but there are still challenges. *Eur Respir J*. 2016 Jul;48(1):6–9.
3. Restrepo RDD, Alvarez MTT, Wittnebel LDD, et al. Medication adherence issues in patients treated for COPD. *Int J Chronic Obstr Pulm Dis*. 2008;3(3):371–384.
4. Sumino K, Cabana MD. Medication adherence in asthma patients. *Curr Opin Pulm Med*. 2013 Jan;19(1):49–53.

Soundappan Kathirvel*
Associate Professor (Community Medicine & School of Public Health), PGIMER, Chandigarh, India

Aravind Gandhi Periyasamy
Murugan Sathiabalan
Senior Resident (Community Medicine & School of Public Health),
PGIMER, Chandigarh, India

Sahajal Dhooria
Associate Professor (Pulmonary Medicine), PGIMER, Chandigarh,
India

Inderpaul Singh Sehgal
Kuruswamy Thurai Prasad
Valliappan Muthu
Assistant Professor (Pulmonary Medicine), PGIMER, Chandigarh,
India

Amarjeet Singh
Professor & Head (Community Medicine & School of Public Health),
PGIMER, Chandigarh, India

Ritesh Agarwal
Professor (Pulmonary Medicine), PGIMER, Chandigarh, India

*Corresponding author.
E-mail address: selvkathir@gmail.com

1 July 2021
Available online xxx

0377-1237/\$ – see front matter
© 2021 Director General, Armed Forces Medical Services. Published by Elsevier, a division of RELX India Pvt. Ltd. All rights reserved.
<https://doi.org/10.1016/j.mjafi.2021.10.008>