Telemedicine for chronic disease care during the COVID-19 pandemic in Nepal: A retrospective study

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Background

- Access to basic healthcare settings is challenging with ***only 62% of population having access to health services within 30 minutes***.

- ***Doctor to patient ratio in Nepal is 8.7:10,000*** less than the World Health Organization's (WHO) prescribed norm of 1:1000.

- According to the National Census 2021, 37.8 percent of Nepali households have internet access and ***73.2 percent of Nepali households use any kind of phone making telemedicine a possible alternative to health care delivery.***

Objective

- To investigate factors associated with adherence to the provided advice through telemedicine.
- To investigate the satisfaction towards telemedicine in eastern Nepal.

Methodology

- **Study Location:** Conducted at the telemedicine unit of KHDC-Nepal in collaboration with BPKIHS, a tertiary care center in Eastern Nepal.

- **Service Promotion:** Telemedicine services were promoted via social media and in-person outpatient visits.

- **Communication Tools**: Contact was made through mobile calls and apps like Viber®, WhatsApp®, Imo®, and Facebook® Messenger.
- **Consultation Format:** Communication included audio, text, photos, and videos with patients or their caregivers.

- **Consultation Team:** Initial consultations were conducted by internists at BPKIHS. Second opinions were taken from specialists (e.g., cardiologist, nephrologist) based on patient needs.

- Initial consultations focused on triage, diagnosis, treatment, health education, counseling, and reassurance.

- **Study Duration:** Between January 2 and October 9, 2021.

- **Sample Size:** Included all 505 patients who accessed telemedicine services during the study period.

- **Patient Groups:** Patients with complete records were categorized into COVID and non-COVID arms.

- **Follow-Up Plan:** Patients with full baseline records were followed up at 3 months post-initial consultation.

- **Follow-Up Methods:** Follow-up was conducted through phone or social media, verified by a nurse.

- **Verification:** Test reports, medication use, and external health facility visits were documented.

- **Patient Feedback:** Patients satisfaction was assessed using a closed question survey to enquire about the satisfaction with the telehealth service and willingness to take similar services in future.

- **Guidelines Followed:** Non-communicable disease management followed WHO PEN; COVID-19 care followed national protocol.

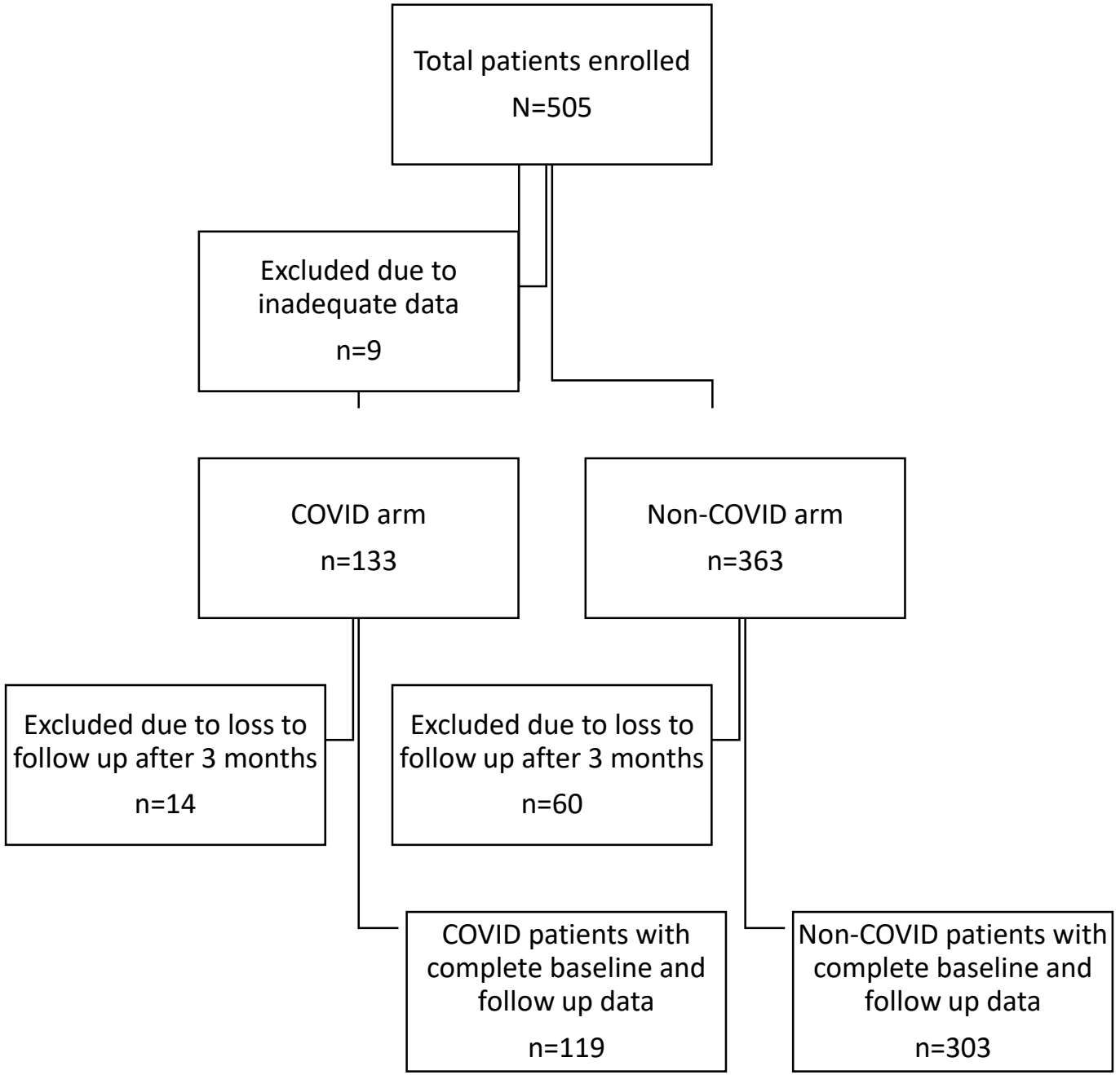
- **Variable Definitions:** Multiple outcome categories were defined (e.g., Treatment and follow-up, Test done, Medicines taken).

- **Adherence Definitions**: Adherence to test was considered if at least one prescribed test was done. Adherence to medicines was considered if at least one of the prescribed medicine taken.

Statistics

- **Statistical Methods:** Data were analyzed using descriptive statistics, Mann-Whitney U test, and logistic regression.

- **Software Used:** Data entry via MS Excel (v10.0); analysis performed using SPSS version 26.0.


Total patients enrolled
N=505
Excluded due to inadequate data
n=9
COVID arm
n=133
Non-COVID arm
n=363
Excluded due to loss to follow up after 3 months
n=14
Excluded due to loss to follow up after 3 months
n=60
COVID patients with complete baseline and follow up data
n=119
Non-COVID patients with complete baseline and follow up data
n=303

Parameters	Without COVID-19 (n1 = 363)	With COVID-19 (n2 = 133)	Overall (n=496)
Median age in years (IQR)	48 (28)	38 (25)	45.5 (28)
Age groups (%)			
≤ 18 years	7 (1.93%)	2 (1.50%)	9 (1.80%)
19-39 years	115 (3.03%)	70 (52.63%)	185(37.30%)
40-59 years	121 (33.33%)	45 (33.83%)	166(33.50%)
60 or more	120 (33.05%)	16 (12.03%)	136(27.40%)
Gender (%)			
Male	185 (51.0%)	64 (48.1%)	249(50.02%)
Female	178 (49.0%)	69 (51.9%)	247(49.80%)

Location (%)			
Eastern Nepal			
Sunsari	180 (49.60%)	91 (68.42%)	271(54.60%)
Jhapa	47 (12.94%)	2 (1.50%)	49(9.87%)
Morang	24 (6.61%)	10 (7.52%)	34(6.85%)
Saptari	11 (3.03%)	2 (1.50%)	13(2.62%)
Others	58 (16.00%)	5 (3.76%)	63(12.70%)
Non-Eastern Nepal			
Kathmandu	11 (3.03%)	9 (6.76%)	20(4.03%)
Birgunj	5 (1.37%)	2 (1.50%)	7(1.41%)
Rautahat	2 (0.55%)	2 (1.50%)	4(0.806%)
Others	24 (6.61%)	8 (6.01%)	32(6.45%)
India			
Sikkim	1 (0.27%)	2 (1.50%)	3(0.60%)

Media used for communication (%)			
WhatsApp messenger	323 (88.98%)	116 (87.22%)	439 (88.5%)
Other messengers	28(7.71%)	13(9.77%)	41 (8.26%)
Mobile phone	12(3.31%)	4(3.01%)	16(3.22%)
Non communicable dise ases			
Diabetes Mellites	144 (29.00%)	12 (2.50%)	156 (31.50%)
Hypertension	136 (27.40%)	15 (3.00%)	151 (30.4%)
Chronic Kidney Disease	51 (10.30%)	5 (1.0%)	56 (11.3%)
Thyroid disease	42 (8.50%)	5 (1.0%)	47 (9.50%)
Heart disease (IHD, Heart failure, Arrythmia, Rheumatic heart disease)	36 (7.25%)	2 (0.4%)	38 (7.65%)
Others	47 (9.50%)	-	47 (9.5%)

	Without COVID-19 (n1=363)	With COVID-19 (n2=133)	Overall (n=496)
Advice given			
Treatment and follow-up	251 (69.1%)	32 (24.0%)	283(57.06%)
Visit the hospital	58 (16.0%)	11 (8.3%)	69(13.91%)
Treatment and reassurance	45 (12.4%)	76 (57.2%)	121(24.40%)
Reassurance only	9 (2.5%)	14 (10.5%)	23(4.63%)
Outcome			
Hospitalization	15 (4.13%)	6 (4.51%)	21(4.23%)
Death	6 (1.65%)	3 (2.26%)	9(1.82%)
Unknown/Could not be contacted	60(16.52%)	14(10.53%)	74(14.92%)
Neither hospitalization nor death	282(77.70%)	110(82.70%)	392(79.03%)

		Test done		
Test advised		Yes	No	Total
	Yes	132	62	194
	No	85	143	228
Total		217	205	422

		Medicines taken		
Medicines advised		Yes	No	Total
	Yes	256	86	342
	No	18	62	80
Total		274	148	422

Factors associated with adherence to tests using logistic regression analysis (n= 422)

		Coeff(B)	Exp(B) OR	95% C.I. Lower	95% C.I. Upper	Sig.(p-Value)
	Tests advised	1.228	3.413	2.209	5.274	<0.001
	Age in years	-0.002	0.998	0.985	1.010	0.720
	Male (Ref: Female)	0.335	1.398	0.926	2.111	0.111
	With COVID-19 (Ref: Without COVID-19)	-0.223	0.800	0.460	1.392	0.430
	Sunsari district (Ref: Others)	0.583	1.791	1.173	2.734	0.007
	WhatsApp social media app (Ref: Others)	-0.286	0.751	0.397	1.421	0.379
	Presence of NCD (Ref: Without NCD)	0.130	1.139	0.683	1.899	0.619
	Omnibus Tests of Model Coefficients					<0.001
	Hosmer and Lemeshow					0.919
	Nagelkerke R square					0.156

Factors associated with adherence to medicines using logistic regression analysis (n=422)

		Exp(B)	95% C.I. for EXP(B)		
	Coeff(B)	OR	Lower	Upper	Sig. (p-Value)
Medicines prescribed	2.518	12.407	6.584	23.381	<0.001
Age	-0.004	0.996	0.982	1.010	0.601
Male Gender (Ref: Female)	0.483	1.620	1.020	2.573	0.041
With COVID-19 (Ref: Without COVID-19)	-1.297	0.273	0.149	0.501	<0.001
Sunsari district (Ref: Others)	0.058	1.060	0.661	1.701	0.809
WhatsApp social media app (Ref: Others)	-0.106	0.900	0.442	1.830	0.770
Presence of NCD (Ref: Without NCD)	-0.420	0.657	0.362	1.192	0.167
Omnibus Tests of Model Coefficients					<0.001
Hosmer and Lemeshow					0.889
Nagelkerke R square					0.285

Take away message

- This study highlights the benefits of telemedicine in the management of chronic diseases in Nepal during a pandemic.

- Patients adhered to the advice and they were satisfied towards the telemedicine services during the COVID-19 crisis.

- Adherence to advice given by telemedicine (medicines, tests) was independent of age, health condition (NCD) or media used for communication.

Take away message

- The service facilitated access to care while protecting the hospital from overcrowding by patients and protecting the patients from nosocomial infections.

- Acceptance of the services by patients as shown in this study motivates the general expansion of the services to improve access to care for persons living in remote areas.

- “Telemedicine” should thus be a part of a national strategy for disaster preparedness in low- middle income countries like Nepal.

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- **Arun Gautam, MD is currently working as Medical Superintendent at Bishnu Devi Hospital, Kirtipur, MoHP, Nepal.**

- **Dr. Gautam has keen interest in academic activities including book writing and research, with a key passion for scientific writing, epidemiology, data analysis and bio-statistics.**

- **He has received numerous awards in research nationally and internationally.**