ORIGINAL ARTICLE

Telemedicine Usability and Satisfaction among Pediatric Rheumatology Patients and their Caregivers during COVID-19 Pandemic

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ABSTRACT

Background. The 2019 coronavirus disease pandemic opened an opportunity to explore the role of telemedicine in pediatric rheumatology clinic as well as patient satisfaction with virtual visits.

Objective. To determine the usability and satisfaction rate of telemedicine among pediatric rheumatology patients and their caregivers.

Method. A cross-sectional online survey was conducted among patients and caregivers consulting via telemedicine at a pediatric rheumatology clinic of University of the Philippines – Philippine General Hospital (UP – PGH), a tertiary government hospital. Collected data included socio-demographics and the validated Telehealth Usability Questionnaire (TUQ).

Results. There were 39 (55.7%) patients and 31 (44.3%) primary caregivers included in the study. Across all usability factors, the response of primary caregivers did not significantly differ from those of patients. The average scores across all questions for both patients and primary caregivers were 5.96±1.19 and 6.04±1.34, respectively. This showed a high level of agreement that they were highly satisfied with telemedicine experience. Among the different usability factors, questions related to usefulness obtained the highest mean score for both patients (6.11±1.17) and primary caregivers (6.12±1.38). While the lowest mean score was observed on questions related to reliability, 5.65±1.33 for patients and 5.89±1.31 for primary caregivers.

Conclusion. Pediatric rheumatology patients as well as their caregivers are generally highly satisfied with telemedicine during this time of pandemic. With high patient and caregiver satisfaction, telemedicine could be an option for ambulatory patient care even after pandemic.

Keywords: telemedicine, telehealth usability questionnaire, COVID-19, pediatric rheumatology, patient satisfaction, caregiver satisfaction

Poster presented at the 37th Annual Research Week of UP-PGH Department of Pediatrics, October 18-22, 2021 at Philippine General Hospital, Manila, Philippines; and at the 28th Annual Convention of the Philippine Rheumatology Association, June 8-11, 2022 at Cebu, Philippines (virtual event).

eISSN 2094-9278 (Online)
Published: April 30, 2024
https://doi.org/10.47895/amp.v58i7.6367

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INTRODUCTION

The 2019 coronavirus disease (COVID-19) pandemic made a great impact on the practice of medicine worldwide. It became a challenge to the medical community on how to provide quality patient care at the same time ensuring the safety of both patients and health care workers.

The World Health Organization (WHO) defines telemedicine as the delivery of health care services by all health care professionals using information and communication technologies for the exchange of valid information for the

diagnosis, treatment and prevention of disease and injuries. Telemedicine also involved exchange of information on research and evaluation as well as for the continuing education of health care providers.[1]

Chronic diseases including rheumatic diseases need constant monitoring and medical care even in the time of the pandemic. Telemedicine has the potential to facilitate timely care and reach patients who cannot go to the clinics as this can bridge patient and physician distances. It can also alleviate the burden of long-distance travel, which may prevent a patient from seeking care. With telemedicine, delays in providing care may be avoided and timely care can be given to the patient.[2]

Prior to the pandemic, the University of the Philippines – Philippine General Hospital (UP – PGH), a tertiary government hospital, had no telemedicine clinic. However, upon the declaration of COVID-19 pandemic, an alternative to face-to-face clinic consults was needed as there were travel restrictions, limited availability of outpatient clinics, and all non-essential visits to hospital were deferred. This resulted in establishing telemedicine as an attempt to reduce COVID-19 transmission while continuing to provide timely medical care to patients.

Even before the COVID-19 pandemic, telemedicine in rheumatology has already been used in the United States and found that it is effective in establishing diagnosis and management of autoimmune and inflammatory rheumatic diseases.[3] Several local studies take a look at the usability and importance of telemedicine during COVID-19 pandemic. It was observed that the utilization of telemedicine increased not only in the country but also across the globe. Though telemedicine has its own limitations, it was perceived to be of value because of the advantages that it offers such as convenience, safety for both patients and caregivers, and ability to provide diagnosis and management of urgent as well as non-urgent cases. Due to these advantages, it is believed that utilization of telemedicine will still continue even if the pandemic ends.[4-7]

To our knowledge, there is no local study done on the usability and satisfaction of telemedicine among pediatric rheumatology patients and their caregivers. Findings from this study can be of benefit to both pediatric rheumatologists and their patients as this can provide baseline data on the usability and patient satisfaction on telemedicine that can be of help to improve delivering medical care especially this time of pandemic. This study aimed to determine the usability and satisfaction of telemedicine among pediatric rheumatology patients and their caregivers.

METHODS

Study design

This was a cross-sectional study design.

Participants

An online survey was used to collect the data. All patients of the UP-PGH Division of Pediatric Rheumatology aged 15-18 years old, and the primary caregivers of patients below 15 years old, who had at least one consult done via telemedicine from March 2020 to August 2021, were included in this study.

Excluded were patients who are already deceased and who have major psychiatric or neurocognitive disorders such as bipolar disorder, severe eating disorder, and mental retardation.

Study Procedure

A chart review of telemedicine consults by UP-PGH Division of Pediatric Rheumatology from March 2020 to August 2021 was used to collect data such as demographics, diagnosis of patients, and the duration of illness. The primary investigator recruited eligible participants through phone call, SMS, or Viber chat. Three attempts were made to contact the participants. An online survey through Google form was used to collect the data. A brief overview of the objectives and procedure of answering the online survey was given to the participants.

The survey was composed of 2 parts: *(1)* Sociodemographic profile and *(2)* the Telehealth Usability Questionnaire (TUQ). TUQ is a validated tool designed to assess usability factors such as usefulness, ease of use, interface quality, interaction quality, reliability, and satisfaction.[8] It uses a Likert scale to rate responses (1 = strongly disagree; 2 = disagree; 3 = somewhat disagree; 4 = neutral; 5 = somewhat agree; 6 = agree; 7 = strongly agree). The total score will be computed by determining a mean score for the 21 questions. To ensure conceptual correspondence, the questionnaire had been translated into Filipino using forward and backward translation. The questionnaire administered was in the Filipino version.

Data analysis

Responses of participants were summarized using descriptive statistics expressed as average, frequencies, and percent. Mann-Whitney *U* test was used to compare patients and caregiver responses on TUQ. P value <0.05 was considered statistically significant.

Ethical consideration

The study was conducted in accordance with the Declaration of Helsinki as approved by the University of the Philippines Manila Research Ethics Board (UPMREB 2021-404-01). Completion of the survey implies consent in participating in the study. The collected data were anonymous and treated as confidential.

RESULTS

Participant characteristics

There were 70 respondents to the survey; 39 (55.7%) pediatric rheumatology patients and 31 (44.3%) primary caregivers. Most of the primary caregivers (87%) were mothers of the patients. Others were sisters (6%), grandmother (3%) and uncle (3%). Most of the respondents lived in Luzon. About 59% of the patients and 45% of the primary caregivers were from the National Capital Region (NCR). The mean age of the patients was 16.7 ± 1.1 years. Majority of them were females (89.7%) and mostly Senior High School students (46.2%). About 44% of them are using the combined synchronous and modular distant type of learning. All of them were old patients and experienced televisits more than 5 times (48.7%). The most common type of televisits was video call (100%) followed by SMS/text messaging/Viber chat (87.2%) and voice call (64.1%). All of the patients used smartphones for televisits and most of them used Wi-Fi (64.1%) as a type of Internet connection (Table 1).

The mean age of primary caregivers was 37.6 ±9.5 years and majority of them were females (96.7%). Most primary caregivers completed high school (41.9%) and 29% were employed. More than half of them had experienced televisits 2 to 3 times (51.6%) and mostly used smartphone and video calls (97.8%). About 74% used Wi-Fi while around 52% used cellular data during televisits (Table 2).

Less than half of total pediatric rheumatology patients including those below 15 years old were diagnosed with systemic lupus erythematosus (48.6%), while 14.3% and 12.9% with juvenile idiopathic arthritis and rheumatic fever, respectively. Duration of illness of these patients was mostly

Table 1. Patient Demographics (N = 39)

	Values
Mean age (± SD)	16.7 ± 1.1
Sex, n, %	
Male	4 (10.3)
Female	35 (89.7)
Present Level of education, n, %	
Elementary (Grades 1-6)	1 (2.6)
Junior High School (Grades 7-10)	14 (35.9)
Senior High School (Grades 11-12)	18 (46.2)
College	6 (15.4)
Types of Distant Learning, n, %	
Synchronous online learning	16 (41.0)
Asynchronous / Modular learning	6 (15.4)
Combined synchronous and modular	17 (43.6)
Encounter Type, n, %	
New patient	0 (0.0)
Old patient	39 (100)
Frequency of televisit, n, %	
Once only	1 (2.6)
2 - 3 times	17 (43.6)
4 - 5 times	2 (5.1)
More than 5 times	19 (48.7)
Type of consult, n, %	
Voice call	25 (64.1)
Video call	39 (100)
SMS/ text messaging/Viber chat	34 (87.2)
Email	6 (15.4)
Device used, n, %	
Non-smartphone	1 (2.6)
Smartphone	39 (100)
Tablet	2 (5.1)
Laptop	6 (15.4)
Desktop	1 (2.6)
Landline	3 (7.7)
Internet Connection, n, %	
Wireless / Wi-Fi	25 (64.1)
Cellular data	21 (53.8)

Table 2. Primary Caregiver Demographics (N = 31)

	Values
Mean age (± SD)	37.6 ± 9.5
Sex, n, %	
Male	1 (3.2)
Female	30 (96.7)
Educational Attainment, n, %	
Elementary graduate	2 (6.5)
High school undergraduate	1 (3.2)
High school graduate	13 (41.9)
Vocational	1 (3.2)
College undergraduate	6 (19.4)
College graduate	8 (25.8)
Employment status, n, %	
Student	2 (6.5)
Employed	9 (29.0)
Unemployed	4 (12.9)
Housewife	15 (48.4)
Retired	1 (3.2)
Frequency of Visit, n, %	
Once only	4 (12.9)
2 - 3 times	16 (51.6)
4 - 5 times	2 (6.5)
More than 5 times	9 (29.0)
Type of consult, n, %	
Voice call	16 (51.6)
Video call	30 (97.8)
SMS/ text messaging/Viber chat	23 (77.4)
Email	1 (3.2)
Device used, n, %	
Non-smartphone	1 (3.2)
Smartphone	30 (97.8)
Tablet	2 (6.5)
Laptop	2 (6.5)
Desktop	1 (3.2)
Internet Connection, n, %	
Wireless / Wi-Fi	23 (74.2)
Cellular data	16 (51.6)

Table 3. Patient Disease Profile (N = 70)

	n, %
Diagnosis	
Systemic Lupus Erythematosus	34 (48.6)
Juvenile Idiopathic Arthritis	10 (14.3)
Rheumatic Fever	9 (12.9)
Non-specific Arthralgia	3 (4.3)
Kawasaki Disease	2 (2.9)
Neonatal Lupus Erythematosus	2 (2.9)
Multisystem Inflammatory Syndrome in Children	2 (2.9)
Systemic Scleroderma	1 (1.4)
Henoch Schonlein Purpura	1 (1.4)
Amplified Musculoskeletal Pain	1 (1.4)
Cogan Syndrome	1 (1.4)
Hypereosinophilic Enteritis	1 (1.4)
Inflammatory Bowel Disease	1 (1.4)
Rheumatologic Manifestation of Mycosis Fungoides	1 (1.4)
Panuveitis	1 (1.4)
Duration of Illness, n, %	
Less than 1 year	23 (32.9)
1 to 3 years	28 (40.0)
4 to 5 years	13 (18.6)
>5 years	6 (8.6)

from 1 to 3 years (40%). Patient disease profile is presented in Table 3.

Response to TUQ

Among patients who completed the survey, the average score across all questions was 5.96 (SD 1.19). This showed a high level of satisfaction among the patients with telemedicine experience. Among the different usability factors, questions related to usefulness of telemedicine obtained the highest mean score (6.11, SD 1.17) followed by questions related to ease of use (6.07, SD 1.10) and satisfaction (6.06, SD 1.11). Across all statements, the highest mean score (6.44, SD 1.05) was seen on the second item, which stated that telehealth could save time traveling to a hospital or clinic. On the other hand, the lowest mean score (5.65, SD 1.33) was related to reliability. Specifically, the lowest mean score about reliability (5.44, SD 1.50) was for the item on being clear of the error message in instructing them how to fix problems (Table 4).

The average score across all questions among primary caregivers was 6.04 (SD 1.34) giving a high level of satisfaction with telemedicine. Similar with responses from patients, questions related to the usefulness of telemedicine had the highest mean score (6.12, SD 1.38) followed by questions on

Table 4. Patient Response to Telehealth Usability Questionnaire (TUQ)

	Mean (SD)	Range (1-7)
1. Telehealth improves my access to healthcare services.	5.92 (1.33)	(2.0 - 7.0)
2. Telehealth saves me time traveling to a hospital or specialist clinic.	6.44 (1.05)	(2.0 - 7.0)
3. Telehealth provides for my healthcare needs.	5.97 (1.09)	(2.0 - 7.0)
Usefulness Scale Summary (Items 1-3)	6.11 (1.17)	**(2.0 - 7.0)**
4. It was simple to use this system.	6.1 (1.17)	(2.0 - 7.0)
5. It was easy to learn to use the system.	6.23 (1.01)	(2.0 - 7.0)
6. I believe I could become productive quickly using this system.	5.87 (1.28)	(2.0 - 7.0)
Ease of Use Scale Summary (Items 4-6)	6.07 (1.1)	**(2.0 - 7.0)**
7. The way I interact with this system is pleasant.	6.08 (1.04)	(2.0 - 7.0)
8. I like using the system.	5.95 (1.15)	(3.0 - 7.0)
9. The system is simple and easy to understand.	6.1 (0.97)	(3.0 - 7.0)
10. This system is able to do everything I would want it to be able to do.	5.69 (1.17)	(3.0 - 7.0)
Interface Quality Scale Summary (Items 7-10)	5.96 (1.09)	**(2.0 - 7.0)**
11. I could easily talk to the clinician using the telehealth system.	6.03 (1.27)	(3.0 - 7.0)
12. I could hear the clinician clearly using the telehealth system.	5.9 (1.17)	(3.0 - 7.0)
13. I felt I was able to express myself effectively.	5.74 (1.19)	(3.0 - 7.0)
14. Using the telehealth system, I can see the clinician as well as if we met in person.	5.82 (1.3)	(3.0 - 7.0)
Interaction Quality Scale Summary (Items 11-14)	5.87 (1.22)	**(3.0 - 7.0)**
15. I think the visits provided over the telehealth system are the same as in-person visits.	5.77 (1.33)	(3.0 - 7.0)
16. Whenever I made a mistake using the system, I could recover easily and quickly.	5.74 (1.16)	(3.0 - 7.0)
17. The system gave error messages that clearly told me how to fix problems.	5.44 (1.5)	(1.0 - 7.0)
Reliability Scale Summary (Items 15-17)	5.65 (1.33)	**(1.0 - 7.0)**
18. I feel comfortable communicating with the clinician using the telehealth system.	6.05 (1.19)	(3.0 - 7.0)
19. Telehealth is an acceptable way to receive healthcare services.	6.03 (1.06)	(3.0 - 7.0)
20. I would use telehealth services again.	6.1 (1.17)	(2.0 - 7.0)
21. Overall, I am satisfied with this telehealth system.	6.23 (1.06)	(3.0 - 7.0)
Satisfaction Scale Summary (Items 18-21)	6.06 (1.11)	**(2.0 - 7.0)**
Total Average	5.96 (1.19)	**(1.0 - 7.0)**

Note: Likert scale used: 1: strongly disagree; 2: disagree; 3: somewhat disagree; 4: neutral; 5: somewhat agree; 6: agree; 7: strongly agree

Table 5. Primary Caregiver Response to Telehealth Usability Questionnaire (TUQ)

	Mean (SD)	Range (1-7)
1. Telehealth improves my access to healthcare services.	6.06 (1.26)	(1.0 - 7.0)
2. Telehealth saves me time traveling to a hospital or specialist clinic.	6.1 (1.62)	(1.0 - 7.0)
3. Telehealth provides for my healthcare needs.	6.19 (1.28)	(1.0 - 7.0)
Usefulness Scale Summary (Items 1-3)	6.12 (1.38)	(1.0 - 7.0)
4. It was simple to use this system.	6.13 (1.36)	(1.0 - 7.0)
5. It was easy to learn to use the system.	6.19 (1.28)	(1.0 - 7.0)
6. I believe I could become productive quickly using this system.	5.97 (1.33)	(1.0 - 7.0)
Ease of Use Scale Summary (Items 4-6)	6.10 (1.31)	(1.0 - 7.0)
7. The way I interact with this system is pleasant.	6.06 (1.39)	(1.0 - 7.0)
8. I like using the system.	6.06 (1.41)	(1.0 - 7.0)
9. The system is simple and easy to understand.	6.32 (1.17)	(1.0 - 7.0)
10. This system is able to do everything I would want it to be able to do.	5.87 (1.48)	(1.0 - 7.0)
Interface Quality Scale Summary (Items 7-10)	6.08 (1.36)	(1.0 - 7.0)
11. I could easily talk to the clinician using the telehealth system.	6.1 (1.33)	(1.0 - 7.0)
12. I could hear the clinician clearly using the telehealth system.	6.1 (1.4)	(1.0 - 7.0)
13. I felt I was able to express myself effectively.	5.81 (1.45)	(1.0 - 7.0)
14. Using the telehealth system, I can see the clinician as well as if we met in person.	6.13 (1.26)	(1.0 - 7.0)
Interaction Quality Scale Summary (Items 11-14)	6.03 (1.35)	(1.0 - 7.0)
15. I think the visits provided over the telehealth system are the same as in-person visits.	5.74 (1.55)	(1.0 - 7.0)
16. Whenever I made a mistake using the system, I could recover easily and quickly.	5.97 (1.25)	(1.0 - 7.0)
17. The system gave error messages that clearly told me how to fix problems.	5.97 (1.11)	(1.0 - 7.0)
Reliability Scale Summary (Items 15-17)	5.89 (1.310	(1.0 - 7.0)
18. I feel comfortable communicating with the clinician using the telehealth system.	6.06 (1.36)	(1.0 - 7.0)
19. Telehealth is an acceptable way to receive healthcare services	5.94 (1.44)	(1.0 - 7.0)
20. I would use telehealth services again.	6.06 (1.41)	(1.0 - 7.0)
21. Overall, I am satisfied with this telehealth system.	6.03 (1.4)	(1.0 - 7.0)
Satisfaction Scale Summary (Items 18-21)	6.02 (1.39)	(1.0 - 7.0)
Total Average	6.04 (1.34)	(1.0 - 7.0)

Note: Likert scale used: 1: strongly disagree; 2: disagree; 3: somewhat disagree; 4: neutral; 5: somewhat agree; 6: agree; 7: strongly agree

ease of use (6.10, SD 1.31). Items stating that telehealth was simple and easy to understand showed the highest mean score (6.32, SD 1.17). Lowest mean score was related to questions on reliability specifically on the item stating that televisits are the same as in-person visits (5.74, SD 1.55). Average scores for all questions and subsections can be seen in Table 5.

The overall satisfaction of patients (5.96, SD 1.19) and caregivers (6.04, SD 1.34) were not significantly different. Likewise, across all usability factors, the response of primary caregiver did not significantly differ from those of patients (Table 6). In addition, the mean score across all questions among all participants was 6.0 giving a high level of agreement for both patients and primary caregivers that they are highly satisfied with their telemedicine experience.

DISCUSSION

The COVID-19 pandemic opened an opportunity to explore the role of telemedicine in pediatric rheumatology as well as patient satisfaction with virtual visits. Patient satisfaction is an important indicator that can be used to measure the quality of health care being provided by the doctors and health institutions.[9] During this time, wherein there is a sudden transition of personal clinic visits to telemedicine, patient satisfaction can play a key role in the success of telemedicine as this can affect clinical outcomes and medical management of patients.

The Telehealth Usability Questionnaire (TUQ) is a validated tool used to evaluate the usability of different telehealth systems. In this questionnaire, the term usability

Table 6. Comparison of Patient and Primary Caregiver Response on TUQ

	Patient (Mean, SD)	Caregiver (Mean, SD)	*p* value
Usefulness Scale Summary	6.11 (1.17)	6.12 (1.38)	0.6125*
Ease of Use Scale Summary	6.07 (1.1)	6.10 (1.31)	0.7062*
Interface Quality Scale Summary	5.96 (1.09)	6.08 (1.36)	0.2630*
Interaction Quality Scale Summary	5.87 (1.22)	6.03 (1.35)	0.2851*
Reliability Scale Summary	5.65 (1.33)	5.89 (1.31)	0.3697*
Satisfaction Scale Summary	6.06 (1.11)	6.02 (1.39)	0.8755*
Total Average	5.96 (1.19)	6.04 (1.34)	0.3497*

**not significant*

refers to whether the technology's functionality does what users need and how easy and pleasant telemedicine features are to use.[10] This tool addresses usability factors such as usefulness, ease of use, effectiveness, reliability, and satisfaction. All of these factors were found to have good to excellent internal consistency.[8]

Majority of the participants were highly satisfied with telemedicine. This finding is similar to other studies done in different medical fields such as rheumatology, dermatology, and rehabilitation medicine, which showed a high level of satisfaction after televisual consultation.[11-13] In a study done by Leggett et al., the majority of rheumatologic patients (58%) reported that they did not need to have face-to-face clinic visits with the specialists.[11] In the field of dermatology, one study showed that 91.5% of patients considered telemedicine equivalent to in person clinic visits.[12] Evidence for usability of telemedicine in rehabilitation medicine was also studied using TUQ. A study done by Faett et al. showed that the delivery of telerehabilitation with real time videoconferencing was viewed positively based on the TUQ scores of the participants. It also gained high satisfaction among all participants and said that they would use it again.[13]

In a few studies about the use of telemedicine in pediatric rheumatology, the study done by Bullock et al., only 8% of the respondents were familiar with telemedicine and the majority of the respondents said that they could not compare its quality to face-to-face clinic visits due to perceived inadequate knowledge. But for those respondents who are familiar with telemedicine, they reported that the quality of telemedicine was equal to or better than face-to-face clinic visits, which is also seen in our study. Also, they more likely preferred telemedicine than face-to-face clinic visits. Familiarity with telemedicine can influence its acceptability.[14]

Most of the patients specifically noted that telemedicine could save them time traveling to a hospital or clinic. About 59% of the patients who answered the survey were from NCR while the rest of the patients came from nearby provinces in Luzon. Travel time was among the potential barriers identified in health care access especially those in remote areas. Although most of the patients who answered the survey were not from remote areas, the difficulty in transportation access (i.e., limited mode of transportation) during a pandemic can increase the travel time from their homes going to a healthcare facility. Awareness in telemedicine gives them an opportunity to access medical care even in the comfort of their own home. This can save them time and avoid travel expenses. Majority of the primary caregivers found telemedicine useful as this can give them access to healthcare services and for them, telemedicine system was simple and easy to understand.

Both patients and primary caregivers gave high satisfaction with interaction quality. This finding is similar with the study done by Layfield et al. wherein it showed that telemedicine was effective for physician-patient interactions.[15] Most of the participants reported that they could easily talk to, hear and see the physician. One of the possible reasons for this was most of the consults were done via video calls (Google Meet). Most of the patients are now on online schooling and they use the same platform for their online classes. This makes them already familiar with the system making it easier for them to conduct online consults.

Among the subsections on TUQ, questions related to reliability had the lowest mean score for both patients (5.65) and primary caregivers (5.89). Possible reason for this is that physical examination with telemedicine is limited and that it is not exactly the same as clinic visit.

Majority of the participants reported that they would use telehealth service again and that overall, they are highly satisfied with it. This implies that patients and primary caregivers are now aware of the benefits and advantages of telemedicine.

Limitations of the Study

With telemedicine, patients and caregivers are required to have baseline knowledge of technology. They must know how to use smartphones or computers and how to have access to the internet. Those patients who have low technology literacy and belong to low socioeconomic status were not reflected in this study. The number of participants in this study may not represent the general population. Additional limitation in this study is the likelihood to commit selection bias since convenience sampling was used. The response of the participants with regards satisfaction on telemedicine may be affected by the established relationships with their physician who was also the primary investigator. Lastly, the results of this study may be affected by the social conditions and implications of COVID-19 pandemic such as unemployment, loss of income, and public health safety.

CONCLUSIONS

This study shows that pediatric rheumatology patients and their primary caregivers are generally highly satisfied with telemedicine. Due to pandemic, they became aware of the use of telemedicine as an alternative to face-to-face clinic visits. With high patient and caregiver satisfaction, telemedicine could be an option for ambulatory patient care even after pandemic. It can provide timely care and improve access to medical care especially those in remote areas.

Recommendations

A larger sample is recommended so that it may represent the general population. Furthermore, attention should be given on training and education in telemedicine for all healthcare professionals handling pediatric rheumatology patients. A set of practice guidelines on how to conduct telemedicine specifically for pediatric rheumatology patients can be made in order to improve delivery of medical care, as the use of telemedicine will likely continue even after the pandemic.

Acknowledgments

Special thanks to Mr. Reginald Arimando for helping in the statistical analysis. Thank you to all the participants of this study for taking time to answer the survey.

Statement of Authorship

All authors certified fulfillment of ICMJE authorship criteria.

Author Disclosure

All authors declared no conflicts of interest.

Funding Source

None.

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