



Original Research Article

Whatsapp based visual impression versus actual impression in patients of common skin disorders: A cross-sectional comparative study

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ABSTRACT

Introduction: Nowadays with increasing use of social media platforms for each and everything, there is an increasing trend for use of whatsapp based consultation for many diseases. But what's app base impression has many limitations and may result in error in diagnosis.

Objective: To compare Whatsapp based visual impression versus actual impression in patients of common skin disorders.

Materials and Methods: In this cross-sectional comparative study held at Department of Dermatology of tertiary care hospital and referral centre in central India, 316 patients of common skin disorders attending Dermatology department were enrolled. Photographs of skin lesions in a patient suffering from skin disorders in pre-determined categories were taken and sent to by 2 independent expert dermatologists by Whatsapp and their impression was recorded. Later same patients were independently evaluated by same investigators by actual clinical examination. It was studied whether both evaluations were matched or not.

Results: At the end of study overall, 69% patients' photographic and clinical impression was matched. Among different groups of disorders, like fungal, bacterial, viral, pigmentary groups, average diagnosis matched in 51% to 80% cases. Highest percentage of diagnosis matched in pigmentary type of disorders at 80% and lowest percentage of diagnosis matched was 51% for papulosquamous disorders.

Conclusion: Whatsapp consultation is frequently sought by patients suffering from various dermatological problems but it's not accurate and not 100% reliable. So clinical evaluation always has an upper hand over an impression made over a photo.

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1. Introduction

Nowadays with increasing use of social media platforms for each and everything, there is an increasing trend for use of Whatsapp based consultation for many diseases. Diagnosis of majority of dermatological diseases is made predominantly based on morphology of skin lesions by their visual examination. Currently, teledermatology is gaining momentum and popularity amongst common people. It also has been demonstrated to be more efficient

and cost-effective in certain settings, especially when travel times are significant.¹⁻⁵ In addition, as mobile technology has improved, there is increasing evidence that smartphones represent a simple, feasible, and reliable method for performing store-and-forward teledermatology consultations.¹ Whatsapp has virtually replaced email based sharing of images of skin lesions. Hence, Whatsapp based consultation is frequently sought by patients suffering from various dermatological problems. Similarly, patients having skin disorders are increasing enormously and due to scarcity of qualified dermatologists especially in urban periphery and in rural areas, Whatsapp consultation is on the

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rise. However, some studies have questioned the reliability and accuracy of teledermatology.^{6,7} With recent approval by Medical Council of India (MCI), teleconsultation, teledermatology by different means has equal clinical and medico-legal significance. For the similar reason, it is important to validate Whatsapp based consultation by comparing it with actual physical one-to-one consultation. Hence, we undertook a study to compare Whatsapp based consultation with actual physical consultation in our dermatology department.

2. Materials and Methods

Out of 16200 patients attending the Dermatology department of our tertiary care hospital and referral centre in central India over a period 6 months period, a total of 316 patients of common skin disorders were included in the study after their informed consent. Approval of the study was obtained from the institutional ethics committee.

Those patients who were willing to participate in the study, those who were treatment-naïve and were suffering from common skin diseases in predetermined categories were included. Patients were categorised and grouped into common fungal, bacterial and viral infections, papulo-squamous disorders, hair, arthropod-borne infections, connective tissue, dermatitis/eczema, appendageal, pigmentary and other disorders. Those patients who were not willing to participate due to various reasons (unwillingness for clicking a photograph being major one), those with uncommon skin diseases or and patients receiving topical or systemic treatment were excluded from the study.

The patients consenting to participate in study and consenting to take photographs of their skin problems were enrolled in study. Independent doctor (non-dermatologist) took photographs of skin problems by good resolution mobile phone camera and was sent to 2 well qualified senior dermatologists (Investigators SYP and KKM) through Whatsapp application on smartphone. After watching photos received by these experts, their impression based on photographs was recorded immediately. Same patient whose photographs were clicked was referred to expert investigators separately for one-to-one physical consultation to record their clinical opinion on a given patient.

Data was recorded in Excel sheets and was kept confidential. Proportion of patients where WhatsApp consultation and actual consultation had matched was calculated. This was done for both investigators to look for inter-observer variability.

3. Results

A total of 316 patients were enrolled in this study with different skin problems. Out of 316, 190 were males and 126 were female patients. Male: Female Ratio was 3:2.

Patients from age group of 10-60 years were enrolled in this study. Mean age of patients was 38 years. We encountered maximum patients of Dermatophytoses, i.e 18.6% followed by Pigmentary disorders which were 14.2% of all diseases. In our study, distribution of skin lesions showed that 38% had involvement in trunk, 36% in face, 24% in extremities and 2% had mucosa involvement.

In Table no 1, out of 316 patients enrolled, 218 patients (69%) Whatsapp based impression matched with clinical impression and in 98 patients (31%) impression did not match. Thus, positive correlation was obtained in 69% patients.

We broadly categorised the total number of patients into various dermatological disorders, and the number of patients with agreement of diagnosis by Whatsapp and Actual consultation (Table 1)

Out of 59 patients of fungal infections, most of them were of Dermatophytoses (51), and few of Onychomycosis (8). Out of 20 patients of bacterial infections, maximum were of folliculitis (13), few of impetigo (4) and carbuncle (3). In viral infections, from 26 patients, most of them were of Herpes zoster (6), Molluscum contagiosum (6), Viral warts (6), Chicken pox (4) and Herpes labialis (4). In 43 patients of papulosquamous disorders, most diagnosis were of Psoriasis (18), lichen planus (8), phrynoderma (10) and seborrheic dermatitis (7). Most patients were of Melasma (18), Post-inflammatory hyperpigmentation (15) and Riehl's melanosis (12) in 45 patients of Pigmentary disorders. Appendageal disorders' 19 patients included most cases of Acne Vulgaris (12) and sebaceous cysts (7).

4. Discussion

In our study, out of 16200 patients attending the Dermatology out-patient department of our tertiary care hospital and referral centre in central India over a period of 6 months period (August 2019 to Jan 2020), a total of 316 patients of common skin disorders were included in the study. In the present scenario of CoVid 19 pandemic in the country, National Medical Commission (NMC) has approved teledermatology with certain rules and regulations. Whatsapp is the most user-friendly and leading platform for teledermatology which has virtually replaced email-based store-and-forward teledermatology all over the world as it is easily available to patients and doctors and it allows faster communication and interactions. Although popularly used in India, its use for online consultation has increased tremendously after it was made legally acceptable. However although approved, there was no studies demonstrating scientific validity between Whatsapp based teledermatology viz-a viz actual clinical consultation. The current study was done for the same purpose.

Our study revealed that out of 316 patients, in 218 patients (69%), clinical diagnosis as obtained by interpreting Whatsapp photographs matched with that

Table 1 : 1 : Different categories of common skin diseases and agreement of diagnosis by Whatsapp and actual consultation

S.No	G roup of skin diseases	Number of patients	Number of patients with agreement of diagnosis by Whatsapp and Actual consultation	
			Investigator 1 (SYP)	Investigator 2 (KMM)
1	Fungal infections	59	46 (77.9%)	46 (77.9%)
2	Bacterial infections	20	11 (55%)	11 (55%)
3	Viral infections	26	19 (73%)	19 (73%)
4	Arthropod-borne infections/manifestations	21	14 (66%)	14 (66%)
5	Papulosquamous disorder	43	22 (51.6%)	21 (48.8%)
6	Hair disorder	11	9 (81.8%)	8 (72.7%)
7	Connective tissue disorder	13	10 (76.9%)	10 (76.9%)
8	Pigmentary disorders	45	36 (80%)	34 (75.5%)
9	Dermatitis or eczema	25	12 (48%)	13(52%)
10	Appendageal disorders (including acne vulgaris)	19	15 (78.9%)	15 (78.9%)
11	Other disorders	34	24 (70.5%)	24 (70.5%)

obtained by actual physical consultation in common skin disorders. This implies that Whatsapp consultation was successful in majority of patients suffering from commonly occurring skin disorders in our study. Study done by P Ishioka et al⁸ revealed that the agreement between in person diagnosis and teledermatology was 73% which was comparable to findings in our study.

Gimeno-Vicente M et al in his questionnaire based study assessed responses of 128 dermatologists who responded that about 74.1% of Whatsapp consultation were for acute inflammatory dermatoses and one third of patients required in person consultation after teleconsultation.⁹

In diseases viral infections (particularly herpes zoster), fungal infections and in acne vulgaris, correlation with two experts is maximum, implying that it is more useful for these common conditions. This is significant as fungal infections and acne forms the bulk of dermatology practice and what's app consultation is possible in such conditions. In eczema or in papulosquamous diseases, correlation was lesser. This is probably because apart from detailed history, these conditions require thorough clinical examination of different parts of the body which was not possible with Whatsapp consultation. We did not allow audio communication in our study so elaborate history taking was not possible. Conditions where palpation or demonstration of signs are required, there may be chances of error in diagnosis.

Also, Inter-observer correlation between two independent experts was seen in 90.6% cases in our study implying that no significant differences in interpretation between two qualified dermatologists. This may be because of the fact that skin diseases included in our study were commonly occurring dermatoses requiring basic dermatology diagnostic skills as possessed by majority of qualified dermatologists. Less inter-observer differences suggests that Whatsapp consultation should be effectively used in cases of common skin diseases. On the contrary,

they need not to be used in rare or uncommon skin diseases which require advanced diagnostic skills of a dermatologist.

In children, we found difficulty in clicking photographs in desired angles due to lack of cooperation for obvious reasons. Patients with genital lesions were reluctant to allow photography. Hence, as of now and in future, teledermatology will be less commonly used for genital dermatology. This is important limitation of teledermatology across the world due to privacy and data confidentiality issues. Future studies will be needed to explore what improvements can be made to this teledermatology system to increase accuracy, reliability and confidence amongst patients about data safety and privacy. In other areas of dermatology, increased training and experience have been shown to improve diagnostic accuracy with teledermatology.^{1,10–13} Thomas J suggested that after initial face-to-face or tele consultation, it becomes very easy for the patient as well as the doctor who can have a follow-up through tele-consultation, which apart from saving time and travel ensures best outcome of the treatment.¹⁴ Tan E et al also suggested that making diagnoses with images alone is challenging, and additional multimodal communication is likely important.¹⁰ During Covid-19 pandemic times, many dermatologists have switched to hybrid model of store-and-forward type of teledermatology incorporating audio or video calls if necessary

Whatsapp based teledermatology is cost effective as it not only saves time but also travel cost and efforts to reach out to available qualified dermatologists. Decreased health-care costs by reducing the number of visits to specialists seems to be possible.¹⁵ This is extremely important in resource poor health set ups in India where expert or highly skilled dermatologists are mostly concentrated in urban areas or metro cities. Reaching out to such dermatologists for consultation incurs great cost and time loss on the part of patients. Practice of teledermatology has no boundaries and likely to become global in times-to-come

Our study had few limitations. We included only common skin disorders. More studies allowing all skin disorders of adequate sample size are recommended. In our study, actual in-person consultation was done after initial Whats based consultation. Hence it is possible that investigators may be biased for clinical diagnosis at the time of actual in person consultation. However this was unavoidable. Hence, further studies involving cross-validation by independent blinded experts are needed.

Whatsapp based consultation is not a substitute to actual clinical consultation and it cannot have 100% accuracy as with face-to-face dermatology consultation as actual consultation involves detailed history taking and eliciting signs on palpation which is not possible with teledermatology. Based on findings of our study, we suggest that such disclaimer should be mentioned in Whatsapp based Teledermatology prescription.

5. Conclusion

Due to scarcity of availability of qualified expert dermatologists in urban periphery and in rural areas, Whatsapp consultation is likely to helpful. However, Whatsapp consultation has its own limitations and there are chances of error also. AS it has same medico-legal importance in the court of law so dependence on Whatsapp for diagnosis is reliable only to a certain extent.

6. Source of Funding

None.

7. Conflict of Interest

None.

References

1. Barbieri JS, Nelson CA, James WD, Margolis DJ, Littman-Quinn R, Kovarik CL, et al. The reliability of teledermatology to triage inpatient dermatology consultations. *JAMA Dermatol.* 2014;150(4):419–24.
2. Armstrong AW, Dorer DJ, Lugn NE, Kvedar JC. Economic evaluation of interactive teledermatology compared with conventional care. *Telemed J E Health.* 2007;13(2):91–9.
3. Eminović N, Dijkgraaf MG, Berghout RM, Prins AH, Bindels PJ, De Keizer N, et al. A cost minimisation analysis in teledermatology: model-based approach. *BMC Health Serv Res.* 2010;10:251. doi:10.1186/1472-6963-10-251.
4. Parsi K, Chambers CJ, Armstrong AW. Cost-effectiveness analysis of a patient-centered care model for management of psoriasis. *J Am Acad Dermatol.* 2012;66(4):563–70.
5. Moreno-Ramirez D, Ferrandiz L, Ruiz-De-Casas A. Economic evaluation of a store-and-forward teledermatology system for skin cancer patients. *J Telemed Telecare.* 2009;15(1):40–5.
6. Viola KV, Tolpinrud WL, Gross CP, Kirsner RS, Imaeda S, Federman DG, et al. Outcomes of referral to dermatology for suspicious lesions: implications for teledermatology. *Arch Dermatol.* 2011;147(5):556–60.
7. Warshaw EM, Lederle FA, Grill JP. Accuracy of teledermatology for pigmented neoplasms. *J Am Acad Dermatol.* 2009;61(5):753–65.
8. Ishioka P, Tenório JM, Lopes PR, Yamada S, Michalany NS, Amaral MB, et al. A comparative study of teledermatoscopy and face-to-face examination of pigmented skin lesions. *J Telemed Telecare.* 2009;15(5):221–5.
9. Gimeno-Vicente M, Alfaro-Rubio A, Gimeno-Carpio E. Teledermatology by WhatsApp in Valencia: Characteristics of Remote Consultation and Its Emotional Impact on the Dermatologist. *Actas Dermosifiliogr.* 2020;111(5):364–80. doi:10.1016/j.ad.2019.10.003.
10. Tan E, Levell NJ. Regular clinical dermatoscope use with training improves melanoma diagnosis by dermatologists. *Clin Exp Dermatol.* 2009;34(8):876–8.
11. Kittler H, Pehamberger H, Wolff K, Binder M. Diagnostic accuracy of dermoscopy. *Lancet Oncol.* 2002;3(3):159–65.
12. Goulart JM, Quigley EA, Dusza S, Jewell ST, Alexander G, Asgari MM, et al. Skin cancer education for primary care physicians: a systematic review of published evaluated interventions. *J Gen Intern Med.* 2011;26(9):1027–35. doi:10.1007/s11606-011-1692-y.
13. Pearl RA, Townley W, Stott D, Grobbelaar AO. Diagnosis of skin lesions by trainee surgeons: experience improves accuracy. *Ann R Coll Surg Engl.* 2009;91(6):494–9.
14. Thomas J, Kumar P. The scope of teledermatology in India. *Indian Dermatol Online J.* 2013;4(2):82–9. doi:10.4103/2229-5178.110579.
15. Kaliyadan F, Venkitakrishnan S. Teledermatology: clinical case profiles and practical issues. *Indian J Dermatol Venereol Leprol.* 2009;75(1):32–5. doi:10.4103/0378-6323.45217.

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