

Perceptions of finger-amputated hand appearance and its effects on social life from the perspectives of affected and unaffected individuals

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ABSTRACT

Aims: Traumatic finger amputation leads to dysfunction and disfigurement of the hand. Hand disfigurements can affect the social lives of affected individuals. The purpose of this study was to investigate affected and unaffected individuals' perceptions of finger-amputated hand appearance and its effects on social life.

Methods: A group of 26 finger-amputated individuals completed a questionnaire assessing the impact of their hand appearance on their social lives and rated their hand appearance using a visual analogue scale (VAS). Hand photographs of members of this group were shown to 50 unaffected individuals, who were asked to rate their appearance using the VAS and complete a questionnaire assessing their reactions to similar hands encountered during daily life.

Results: In the patient group, the mean VAS and questionnaire scores were 5.1 ± 2 (range: 1–10), and 60.3 ± 17 (range: 31–94), respectively. In the assessor group, the mean VAS score for all 26 hand photographs was 7.1 ± 2 (range: 3–9) and the mean questionnaire score was 83.6 ± 11 (range: 56–100). While the patients' and assessors' VAS scores were significantly correlated for each hand photograph ($r=0.511$, $p=0.008$), in total, 21 of the 26 VAS scores were lower for the patient than assessor group. The VAS and questionnaire scores in the patient group improved significantly with time since amputation ($p=.00$ and $p=0.011$, respectively).

Conclusion: The self-evaluation results of the affected group were worse than those of the unaffected group in terms of perceptions of appearance and the resultant effects on their social lives. We conclude that individuals without finger-amputated hands perceived hand disfigurements less negatively than affected patients. This knowledge may aid the psychosocial support of patients with hand anomalies.

Keywords: Finger-amputated, hand appearance, perception, psychosocial impact

INTRODUCTION

Finger amputation is one of the most frequent injuries affecting the upper extremities.^{1,2} Finger replantation is required surgical procedures for amputations. Despite technological advancements, the outcome of replantation is dependent on both immutable and modifiable factors (e.g., type of injury, patient age, medical condition, and risk factors).^{3,4} Therefore, after these injuries, individuals may be forced to live the rest of their lives with a finger-amputated hand.

The appearance of the hand is important in social life.⁵⁻⁹ After the face, the hand is the most visible part of the body and is also used as a means of expression. Traditionally, functional results were prioritized when resolving hand-related problems. However, hand appearance is also important in the evaluation of treatment results in

hand-related problems.⁹⁻¹³ Few studies have dealt with the relationship between hand appearance and social life.^{7,9-17} Nevertheless, in all these mentioned studies, the appearance of the hand has been evaluated by the patient, the parent, or the researchers.^{7,9-13} In this study, we evaluated the effects of finger-amputated hand appearance on social life from the perspectives of affected and unaffected individuals.

METHODS

The study was carried out with the permission of Mersin University Medical Faculty Clinical Researches Ethics Committee (Date: 04/09/2019, Decision No: 2019/366). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of

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Helsinki. Two study groups were formed. The first (patient group) consisted of individuals with amputated fingers after hand injuries. The second (assessor group) consisted of unaffected participants who were asked to assess the patients' hand photographs and complete a related survey. The number of individuals in the patient and assessor groups was set to minimum 25 participants because these would provide us with adequate power ($1-\beta=0.9$, $\alpha=0.05$). Informed consent was obtained from all study participants.

Patient Group

We included patients who had undergone single or multiple finger stump revision surgery after traumatic amputation, had fully healed wounds, were aged 18–65 years, and agreed to participate in the study. Patients with a history of receiving any form of psychiatric support or treatment were excluded from the study. Patients were invited to participate in the study on presenting to the orthopedic outpatient clinic with a complaint other than their injured hand. A total of 26 patients (26 males) were included. The mean age of the patient group was 36.2 ± 14 years (range: 18–65 years), and the mean time after injury was 51.1 ± 103 months (range: 3–400 months).

Information regarding the level of the amputations, involved rays, and number of amputated fingers was collected. Regarding the level of the amputations, 9 amputations were distal to the distal interphalangeal (DIP) joint, 7 were between the proximal interphalangeal (PIP) and DIP joints, and 15 were between the metacarpophalangeal and PIP joints. Regarding the number of involved rays, there were 22 single ray (3 thumbs and 8 index, 6 middle, 4 ring, and 1 little finger), and 4 multiple ray (3 index and middle, and 1 index, middle and ring finger) amputations.

Photographs were taken of both hands, all using the same camera (PL170; Samsung, Seoul, South Korea), light settings, distance, and platform. Both palmar- and dorsal-side photographs were taken (Figure 1). The patients were asked to complete a questionnaire consisting of 10 items (Table 1). After completion, each patient was asked to rate the appearance of their own injured hand using a 10-point visual analogue scale (VAS). Point 0 represented an “always disturbing” appearance and point 10 a “never disturbing” one.

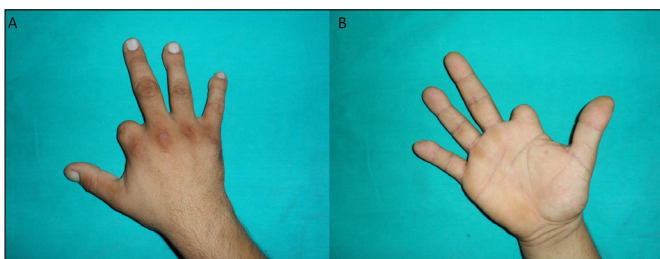


Figure 1. Example hand photographs shown to the assessors: dorsal (A) and palmar (B) views.

Table 1. The questionnaire developed for the patient group			
1. Do you need to hide your hand during daily life? (for example; with gloves or with long sleeves)			
Yes, always	1	Seldom	3
Yes, often	2	No, never	4
2. How often do your first-time contacts ask the question "what happened to your hand"?			
At least once every day	1	Seldom	3
Often, even if not every day	2	I don't remember being asked at all	4
3. Do you use your affected hand in activities (shaking hands, giving/receiving items, etc.) that may come into contact with the hands of other individuals of the community?			
I never use	1	Sometimes I hesitate, but use it often	3
I try not to use as much as possible	2	I always use without hesitation	4
4. Do you have the feeling that other individuals in the community are disturbed by the appearance of your hand in daily activities (handshaking, giving/receiving items, etc.) that make your hand visible?			
Yes, always	1	Seldom	3
Yes, often	2	No, never	4
5. Are you currently working in a job?			
No	0	Yes	4
6. If "No", why are you not working?			
I hesitate of people seeing my hand			1
Because of both the dysfunction and appearance of my hand			2
Because of dysfunction of my hand			3
The cause is not about my hand (for example; I got laid off and couldn't find a job again)			4
7. If you have returned to your job, how did your hand problem affect you in terms of your profession?			
I have serious problems because of the appearance of my hand rather than its dysfunction.			1
I have problems because of both the dysfunction and appearance of my hand.			2
I have problems because of the dysfunction of my hand rather than its appearance.			3
Neither the appearance nor the dysfunction of my hand is a problem.			4
8. Has there been a change in your job after amputation?			
Yes	0	No	4
9. If "Yes", which one was the most influential in your decision?			
Appearance of my hand			1
Appearance and dysfunction of my hand			2
Dysfunction rather than the appearance of my hand			3
It is not about my hand			4
10. Do you have the feeling that you get different reactions from other individuals (customer, colleagues, boss, etc.) due to the appearance of your hand in your workplace?			
Yes, always	1	I don't realize much	3
Yes, often	2	Never before	4
*maximum score is 32.			
**Final point= (total score/32)x100			

Assessor Group

Participants were selected for the assessor group from among the companions of patients who presented to the outpatient clinic with lower extremity complaints. Healthcare workers, individuals aged < 18 or > 65 years, and first-degree relatives with a previous history of hand

injury or traumatic finger amputation were excluded from the study. On every day during a 50-day period, patient companions with these characteristics were invited to participate in the study. If they refused to take part, another companion meeting the same criteria was invited to participate.

The assessor group consisted of 50 participants (29 males and 21 females) with a mean age of 39.4±13 years (range: 18–64 years). The album of hand photographs of the patient group was shown to each participant, and they were asked to rate the appearance of each injured hand using the VAS. On this scale, 0 represented a “very disturbing” appearance and 10 an appearance that was “not disturbing”. Then, the participants were asked to complete a questionnaire consisting of five items (Table 2). For each injured hand, the mean VAS score for the 50 assessors was calculated.

Table 2. The questionnaire developed for the assessor group		
Please answer the following questions, taking into account the photo album of the hands you have looked at.		
1. How did it make you feel to look at the photos?		
I was so emotionally affected that I couldn't look at them all.	1	
I was uncomfortable and had a hard time looking.	2	
I felt a little uncomfortable but I kept looking at them all.	3	
It was like I was looking at a normal hand and I did not feel uncomfortable.	4	
2. In social activities where hands can touch (shaking hands, giving/receiving items, etc.) does it bother you to encounter a hand similar to the photographs?		
I would be emotionally affected and do not know how to react.	1	
I would be disturbed and would not want to look.	2	
I would be uncomfortable, but I would try not to show my discomfort.	3	
I would take it completely normal and not be bothered	4	
3. When you first meet someone who has a hand similar to the photos, do you ask the question "What happened to your hand?"		
I surely ask.	1	
Even if I force myself not to ask, I ask.	2	
I wonder what happened, but I don't ask.	3	
I think it's a personal and natural situation and I never ask.	4	
4. Do you avoid touching a hand similar to the photos in your social life? (for example; handshaking, giving/receiving items etc.)		
I definitely avoid.	1	
I avoid as much as possible.	2	
I touch but I feel disturbed.	3	
I never hesitate to touch.	4	
5. If one of your co-workers had a hand similar to that in the photos, would you treat him/her differently from your other colleagues? (if you are not working please assume that you are working)		
Yes	1 Seldom	3
Maybe	2 Never	4
*maximum score is 32.		
**Final point= (total score/32)x100		

Assessed Parameters

The VAS is a psychometric scale that can be used to assess the appearance of the hand.^{9-11,13} The VAS scale completed by the patients in this study captured their usual perceptions of the appearance of their injured hands. The VAS scale for the assessor group was designed to provide a “snapshot” of their perceptions of the appearance of the injured hands.

To assess the effect of hand appearance on the participants’ social lives, two questionnaires were developed. On the questionnaire for the patient group (Table 1), a score of 100 indicated no effect of hand appearance on the patient’s social life. On the assessor group questionnaire (Table 2), a score of 100 indicated that the appearance of the injured hands was not perceived as abnormal, i.e., that the participant did not react negatively to hand abnormalities encountered in daily life similar to those in the photo album.

To allow correlation analysis between the patient and assessor group scores, “cross-questions” were included in the questionnaires. Both groups completed the survey only once, to ensure that there was no practice effect.

Statistical Analysis

To measure the reliability and internal consistency of the questionnaires, Cronbach’s alpha values were calculated. After analyzing the normality of the data, Pearson correlation analysis (r= 0.1-0.3 weak; r=0.3-0.5 moderate; r=0.5-1.0 strong correlation), the chi-square test, and cross-tables were used to analyze the data. The t-test was used for comparison of two independent groups. A p-value of < 0.05 was taken to indicate statistical significance.

RESULTS

The Cronbach’s alpha values of the patient and assessor questionnaires were 0.73 and 0.74, respectively.

The mean VAS and questionnaire scores of the patient group were 5.1±2 (range: 1–10), and 60.3±17 (range: 31–94), respectively (Figures 2 and 3); these scores were significantly correlated (r=0.434, p=0.027).

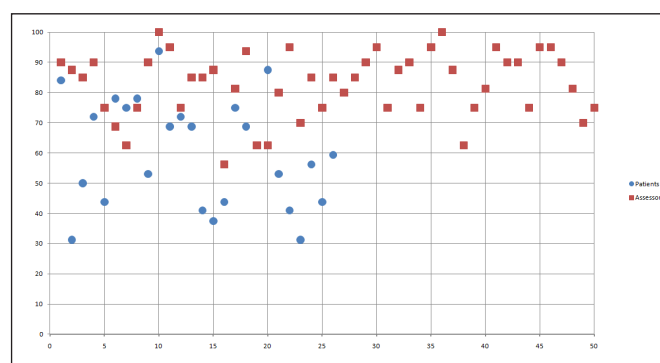


Figure 2. Comparison of the questionnaire results of the patients and assessors for each hand photograph. Red squares: mean questionnaire scores of the assessors; blue circles: questionnaire scores of each patient.

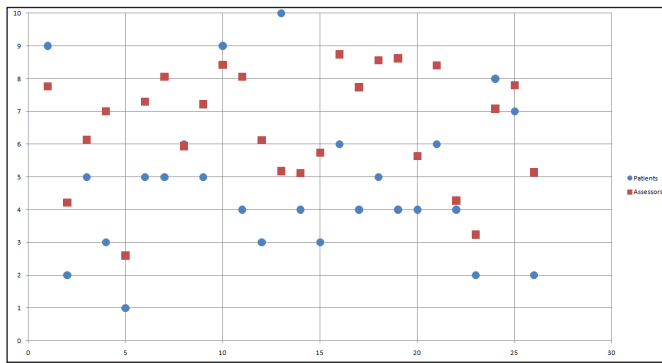


Figure 3. Comparison of the visual analogue scale (VAS) scores of the patients and assessors for each hand photograph. Red squares: mean VAS scores of the assessors; blue circles: VAS scores of each patient.

In the assessor group, the mean VAS score for all 26 hand photographs was 7.1 ± 2 (range: 3–9) and the mean questionnaire score was 83.6 ± 11 (range: 56–100) (Figures 2 and 3). In this group, the mean VAS and questionnaire scores also showed a significant correlation ($r=0.302$, $p=0.033$).

For each hand photo, the patients' and assessors' VAS scores were significantly correlated ($r=0.511$, $p=0.008$). In total, 21 of the 26 VAS scores were lower for the patient than assessor group.

There was no statistically significant correlation between the questionnaire scores of the two groups ($p=0.887$).

In the patient group, both the VAS and questionnaire scores improved significantly according to the time since the amputation ($p=.00$ and $p=0.011$). Patient age was not significant related to the VAS or questionnaire scores ($p=0.995$).

In the assessor group, age and gender showed no significant relationships with the VAS or questionnaire scores ($p=0.08$ and $p=0.28$).

DISCUSSION

Traditionally, the primary goal of treatment for patients with hand injuries is to restore functionality; therefore, hand appearance is often neglected when evaluating treatment outcomes.^{6,18} However, aesthetic appearance is an important consideration because the hands are uncovered in daily life and play a role in non-verbal communication.^{6,19} If hand appearance is compromised, body image may worsen, which has psychological and social consequences.^{6,14,17,18,20} The influence of body image on psychological wellbeing can be explained by an "external view", where reactions in the social environment hold up a mirror to the self, and by an "internal view", i.e., the impact of body image on self-perceptions.⁸ We assessed both factors in our patients with traumatic finger amputations.

In the literature, there are studies assessing social impact or social participation after loss of upper limb or hand injury but none of them simulated the perspective of

the community.^{14,16,17} Rumsey et al.¹⁵ stated that most people with hand injuries were experiencing psychosocial problems in addition to physical and functional difficulties. In this study, the VAS and questionnaire scores of the patients were worse than those of the unaffected group, in terms of the perceived appearance of their hands and the reservations caused by this perception in social life effects of the abnormalities (5.1 versus 7.1; 60.3 versus 83.6 respectively). The VAS scores of the patient and unaffected groups were significantly correlated ($r=0.511$, $p=0.008$). We interpreted this situation as the patient's and society's similar perceptual reactions to the abnormal hand appearance. However, the correlation between the VAS scores and ratings for social life problems were stronger in the patient group. Also, the questionnaire scores of the unaffected group reflected a much more optimistic outlook regarding social interactions.

According to the results of our study, we think that the patient perspective perceives the appearance of the hand slightly worse than the community. If we interpret the impact of social life from both perspectives; we think that patients are negatively affected in social life, but community is not disturbed as patients.

Our findings suggested that the above-mentioned internal view may exert more influence on the interaction between the hand appearance and social lives of patients than the external view. This accords with a previous study, in which emotional well-being and quality of life in the context of general body disfigurement were mainly determined by the internal view.⁸

In case of any disability in the body, it is well-known that as time passes after the injury, a person's ability to adapt to the situation increases.^{12,14,16,21,22} In the present study we observed a significant improvement in our patients' VAS and questionnaire scores with increasing time since the trauma and resulting finger amputation. This finding, which is in line with previous studies, shows that patients cope better with their altered hand appearance over time.

The main limitation of our study was that the results were pertain to a specific sociocultural environment; validation in other social environments is thus required. The validity of survey-based research also depends on the clarity, length, and content thereof, and the level of comprehension of the participants.²³ We believe that our questionnaire was favorable in these respects. Another potential limitation of survey studies relates to the reliability of the questionnaires, although the Cronbach's alphas in this study indicated high reliability and internal consistency.²⁴ Nevertheless, similar studies in different social settings are required to confirm the validity and reliability of our results.

CONCLUSION

The results of this study could inform therapy and psychosocial support for patients with hand trauma. Interventions could be developed to inform patients about the external and internal perspectives of hand disfigurements discussed above, i.e., that others' perceptions of hand abnormalities tend to be more favorable than self-perceptions, and that coping improves over time. With greater awareness of these issues, patients may be motivated to participate in social life earlier and more fully.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Mersin University Medical Faculty Clinical Researches Ethics Committee (Date: 04/09/2019, Decision No: 2019/366).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Author Contributions: All the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Crowe CS, Massenburg BB, Morrison SD, et al. Global trends of hand and wrist trauma: a systematic analysis of fracture and digit amputation using the global burden of disease. 2017 study. *Inj Prev*. 2020;26:115-124.
2. Samantaray SA, Oommen J, Thamunni CV, et al. Fingertip injury epidemiology: an Indian perspective. *J Plast Surg Hand Surg*. 2022;56(4):224-228.
3. Tejedor Navarro A, Vendrell Jordà M, Puente Alonso C. Digital replantation/revascularization: predictive factors to microsurgery success—a single-center study. *Eur J Trauma Emerg Surg*. 2021;47(1):225-232.
4. Kükrek H, Moog P, Nedeoglu E, et al. The declining number of finger replantations in Germany. *Ann Plast Surg*. 2022;88(1):44-48.
5. Wood SM, Kim YJ, Seyferth AV, et al. Quality metrics in hand surgery: a systematic review. *J Hand Surg Am*. 2021;46(11):972-979.
6. Johnson SP, Sebastin SJ, Rehim SA, Chung KC. The importance of hand appearance as a patient-reported outcome in hand surgery. *Plast Reconstr Surg Glob Open*. 2015;3(11):e552.
7. Rehim SA, Kowalski E, Chung KC. Enhancing aesthetic outcomes of soft-tissue coverage of the hand. *Plast Reconstr Surg*. 2015;135(2):413-28.
8. Thompson A, Kent G. Adjusting to disfigurement: processes involved in dealing with being visibly different. *Clin Psychol Rev*. 2001;21(5):663-682.
9. Duncan JAL, Bond JS, Mason T, et al. Visual analogue scale scoring and ranking: a suitable and sensitive method for assessing scar quality? *Plast Reconstr Surg*. 2006;118(4):909-918.
10. Goldfarb CA, Patterson JM, Maender A, Manske PR. Thumb size and appearance following reconstruction of radial polydactyly. *J Hand Surg Am*. 2008;33(8):1348-1453.
11. Goldfarb CA, Steffen JA, Stutz CM. Complex syndactyly: aesthetic and objective outcomes. *J Hand Surg Am*. 2012;37(10):2068-2073.
12. Kovacs L, Grob M, Zimmerann A, et al. Quality of life after severe hand injury. *J Plast Reconstr Aesthet Surg*. 2011;64(11):1495-1502.
13. Singer G, Thein S, Kraus T, Petnehazy T, Eberl R, Schmidt B. Ulnar polydactyly - an analysis of appearance and postoperative outcome. *J Pediatr Surg*. 2014;49(3):474-476.
14. Kristjansdottir F, Dahlin LB., Rosberg HE, Carlsson IK. Social participation in persons with upper limb amputation receiving an esthetic prosthesis. *J Hand Ther*. 2020;33(4):520-527.
15. Rumsey N, Clarke A, White P, Hooper E. Investigating the appearance-related concerns of people with hand injuries. *Br J Hand Ther*. 2003;8(2):57-61.
16. Sposato L, Yancosek K, Lospinoso J, Cancio J. Psychosocial reactions to upper extremity limb salvage: a cross-sectional study. *J Hand Ther*. 2018;31(4):494-501.
17. Sposato L, Yancosek K, Cancio J. Psychosocial reactions to upper extremity limb salvage: a case series. *J Hand Ther*. 2019;32(1):48-56.
18. Manske PR. Aesthetic hand surgery. *J Hand Surg Am*. 2002;27(3):383-384.
19. Hall JA, Horgan TG, Murphy NA. Nonverbal communication. *Ann Rev Psychol*. 2019;70:271-94.
20. Tocco I, Salini E, Bassetto F. Impact of hand injury on patients: psychosocially oriented nurse care. *Int J Nurs Pract*. 2011;17(3):275-279.
21. Cederlund R, Jönsson ALT, Dahlin LB. Coping strategies in daily occupations 3 months after a severe or major hand injury. *Occup Ther Int*. 2010;17(1):1-9.
22. Brown PW. Less than ten—surgeons with amputated fingers. *J Hand Surg Am*. 1982;7(1):31-37.
23. Giladi AM, Ranganathan K, Chung KC. Measuring functional and patient-reported outcomes after treatment of mutilation hand injuries. A Global Health Approach. *Hand Clin*. 2016;32(4):465-475.
24. Taber KS. The Use of Cronbach's alpha when developing and reporting research instruments in science education. *Res Sci Educ*. 2018;48:1273-1296.