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Title	Development of an Affordable Prosthetic Finger from Natural Rubber: A pilot study
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Abstract

Objectives: To evaluate and compare the appearance between silicone, natural rubber, and ethylene-vinyl acetate (EVA) finger prostheses.

Methodology: Twenty participants were invited to participate in this study. The mean age was 30.2 ± 5.53 , 11 (55%) were female, and 9 (45%) were male. Thirteen (65%) were prosthetic and orthotic students, and 7 (35%) were other professional students at Siriraj Hospital. All participants were healthy with no color and visual impairments. Participants were asked to evaluate the appearance of finger prostheses by Likert scale for three finger prostheses. Silicone, natural rubber, and EVA finger prosthesis compared with the nonamputated finger as a reference. Scores were 1 worst, 2 poor, 3 fair, 4 good, 5 excellent in four different categories: skin tone, outward appearance, detail of prosthesis, and shape. For improvement, additional comments from the participants were recorded.

Results: The silicone finger prosthesis's total scores ranged from 80% excellent to 1.25% fair across all four categories. The natural rubber finger prosthesis scored from 13.75% excellent to 3.75% poor, a score of 13.75% good to 10% worst in EVA finger prosthesis was seen. The skin tone of silicone, natural rubber, EVA finger prosthesis were 4.65 ± 0.59 , 3.6 ± 0.60 , and 2.45 ± 0.76 , respectively. The outward appearance were 4.75 ± 0.44 , 3.9 ± 0.64 , and 2.2 ± 0.83 , respectively. The detail of the prosthetic finger were 4.85 ± 0.37 , 4.05 ± 0.76 , and 2.85 ± 0.87 , respectively. The shape were 4.9 ± 0.31 , 3.75 ± 0.79 , and 2.4 ± 0.88 , respectively.

Discussion and Conclusion: These results evidenced the natural rubber appearance was between excellent to poor. The detail of natural rubber prosthetic finger were from excellent to fair while other categories results were good. The detail category for EVA finger scored from good to poor, while other categories scores ranged from fair to poor. The silicone finger prosthesis had a better appearance than the natural finger prosthesis, with the EVA finger prosthesis scoring lowest.