Validity, reliability, and comparison of the Indonesian version of two Baumann Skin Type Indicator (BSTI) questionnaires

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Background

Skin type classification guides dermatological management, skincare selection, and research. Traditional categories (dry, oily, combination, sensitive) leave out pigmentation, photoaging, and age-related change,[1] and the Fitzpatrick phototype, most used in Indonesia, mainly reflects UV response.[2] The Baumann Skin Type Indicator (BSTI) sorts skin on four dichotomous parameters into 16 types;[3] a simplified 7-item version followed in 2022. No validated multidimensional skin type tool exists for the Indonesian population.

The four BSTI parameters

Parameter	Code	2006	2022
Dry vs Oily	D / O	11	Q3, Q4
Sensitive vs Resistant	S / R	18	Q5 (five subtypes)
Pigmented vs Non-pigmented	P / N	14	Q6
Tight vs Wrinkled	T / W	21	Q7 or age ≥ 30
Total	16 types	64	7

2022: Q1 and Q2 record gender and age; Q5 subtypes are acne, redness or flushing, burning or stinging, allergic reactions, and irritation; W is assigned for three or more Q7 choices or age 30 years or older. Q refers to the question number in each version.

Objective

To evaluate the validity and reliability of the Indonesian translations of the 2006 and 2022 BSTI (BSTI-Ina), and the agreement between them, in Indonesian adults.

Methods

Design and participants

Cross-sectional study (STROBE) at the Department of Dermatology and Venereology, Faculty of Medicine, Universitas Indonesia, July to October 2023. Consecutively recruited adults completed both questionnaires online between 8 and 22 September 2023.

Included	Aged 18 to 59 years; Fitzpatrick skin types III to V; fluent and literate in Bahasa Indonesia; senior high school education or higher
Excluded	Facial dermatoses over 25% of the face; cosmetic procedures (chemical peels, laser, dermabrasion, botulinum toxin, fillers, skin-rejuvenation injections) within 2 weeks; incomplete responses

Statistical analysis

Content validity	Expert committee review and pre-final testing
Construct validity	Pearson item-total correlation; valid if r > 0.2
Reliability	Cronbach's α: 0.6 to 0.8 acceptable, above 0.8 good, above 0.9 very good
Agreement	Intraclass correlation coefficient (ICC); predetermined threshold 0.25
Software	SPSS version 25

Translation and cross-cultural adaptation

Following Sousa and Rojjanasrirat[4]

1. **Author permission** — Granted by Dr. Leslie Baumann, author of the BSTI
2. **Forward translation** — Two certified translators, one with a medical background
3. **Committee review** — Two dermatologists, a biostatistician, a clinical psychologist, and both translators
4. **Back-translation** — Two further certified translators, blinded to the originals
5. **Author approval** — Both translations reviewed and approved by Dr. Baumann
6. **Pre-final testing** — 30 participants via Google Forms; no revisions needed
7. **Field testing** — 150 participants: the 30 pre-final plus 120 new

Results

150 adults — Median age 35 years (IQR 29 to 44)

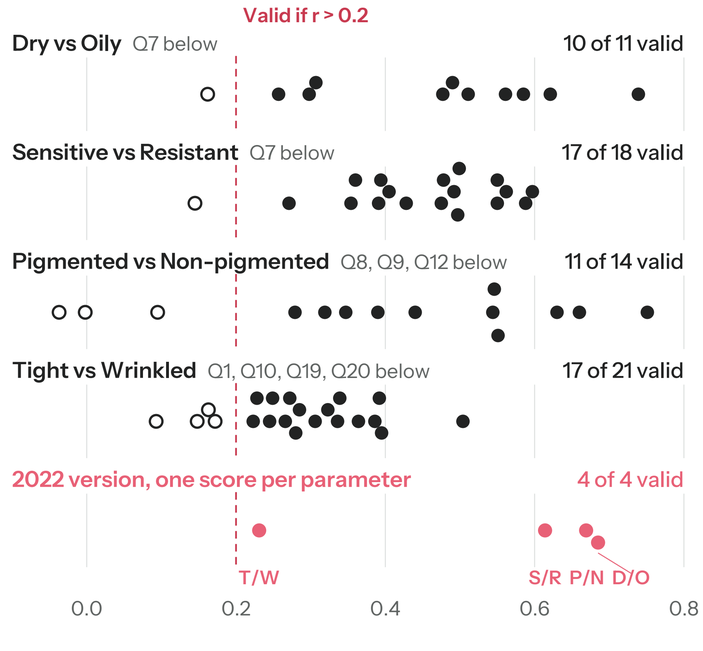
Women **72.7%** / Men **27.3%**

High school **29.3%** / Diploma **20.7%** / Bachelor **50.0%**

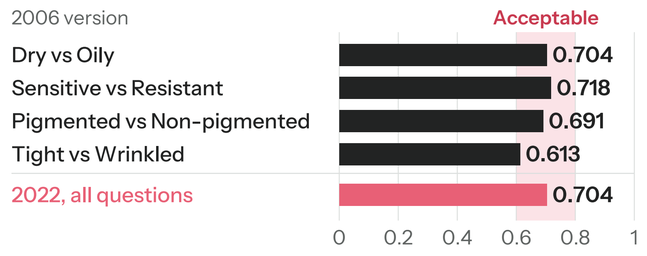
Married 66.7%. Occupation: private sector 32.0%; civil servant, military, or police 30.0%; health-care worker 14.0%; student 12.7%; self-employed 6.0%; housewife 4.7%; other 0.7%.

Construct validity

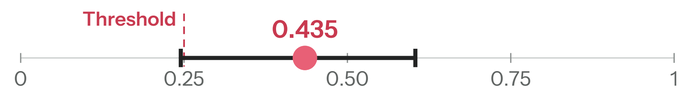
Corrected item-total correlation (r) by parameter



Internal consistency (Cronbach's α)



Agreement between versions



ICC 0.435 (95% CI 0.245 to 0.604; p = 0.0001), above the predetermined threshold of 0.25: moderate agreement.

Skin type distribution across the 16 BSTI types

Percentage of the 150 participants assigned to each type

2006 version, 64 items

DRPT 0.7	DRNT 10.7	DSPT 6.0	DSNT 6.7
DRPW 3.3	DRNW 4.7	DSPW 7.3	DSNW 10.0
ORPT 2.7	ORNT 12.7	OSPT 4.0	OSNT 8.0
ORPW 2.7	ORNW 5.3	OSPW 7.3	OSNW 8.0

2022 version, 7 items

DRPT 0.0	DRNT 0.7	DSPT 2.0	DSNT 0.0
DRPW 4.0	DRNW 3.3	DSPW 24.7	DSNW 11.3
ORPT 0.0	ORNT 0.7	OSPT 1.3	OSNT 1.3
ORPW 7.3	ORNW 10.7	OSPW 16.7	OSNW 16.0

0% — 25% of participants

Wrinkled (W) types: 48.7% in the 2006 version vs 94.0% in the 2022 version, in line with automatic W classification from age 30. Sensitive (S) types: 57.3% vs 73.3%.

Discussion

Low-scoring 2006 items reflect population characteristics and response homogeneity:

D/O Q7: foaming soap	Varied soap formulations
S/R Q7: rash under a ring	Ring rash rarely experienced
P/N Q8, Q9: sun response	Fitzpatrick IV to V: tan easily, burn less
P/N Q12: hair color	Most answered black
T/W Q1: facial wrinkles	Median age 35 years (Glogau II)
T/W Q10: sun exposure	Uniformly high in the Jakarta area
T/W Q19, Q20: skin color, ethnicity	Homogeneous Indonesian Asian sample

Structural differences (item count, the age rule for W, sensitive subtypes) meant perfect agreement between versions was not expected.

Strengths and limitations

First study to validate both BSTI-Ina versions and test their agreement, and the first published evaluation of the 2022 BSTI. Cultural validity was not tested, and participants came only from Jakarta and surrounding areas, while perceptions of skin type may differ across Indonesia's ethnic groups.

Conclusion

Both the 64-item 2006 and the 7-item 2022 Indonesian BSTI (BSTI-Ina) showed acceptable validity and reliability in Indonesian adults, with moderate agreement between the two versions. The shorter 2022 BSTI-Ina offers a practical tool for routine skin-type assessment.

Abbreviations. **Q**, question. **BSTI**, Baumann Skin Type Indicator. **BSTI-Ina**, Indonesian version of the BSTI. **D/O**, dry vs oily. **S/R**, sensitive vs resistant. **P/N**, pigmented vs non-pigmented. **T/W**, tight vs wrinkled. **ICC**, intraclass correlation coefficient. **IQR**, interquartile range. **CI**, confidence interval. **STROBE**, Strengthening the Reporting of Observational Studies in Epidemiology.

Ethics

Research Ethics Committee, Faculty of Medicine, Universitas Indonesia (KET-174/UN2.F1/ETIK/PPM.00.02/2023). All participants gave written informed consent.

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Full article

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