Photography Method

The camera is mounted on a tripod and adjusted in height according to each subject to achieve standardized images following the method described by Claman et al. The distance between the camera and the subject is maintained at 1.5 meters. A 70-120mm telephoto lens is used, set at a 70mm focal length. The aperture and shutter speed are adjusted accordingly based on the available natural lighting conditions during the photoshoot.

Photography Procedure:

Step 1: Instruct the subject to sit on the chair with their head in a natural head position while looking straight into the mirror. Guide the subject to adjust their posture so that the distance from the outer canthus to the hairline at the temples is equal on both sides. Ensure that the interpupillary line and the line connecting the outer canthus to the auricular apex are parallel to the floor.

Step 2: The standardized ruler is securely attached to the holder and positioned horizontally above the subject's head. The camera's focus point is aligned between the subject's eyes. Capture a frontal facial photograph.

Step 3: The subject remains seated but turns 90 degrees from the frontal position. The head remains in a natural position, with the subject looking straight into the mirror. The posture is adjusted so that the line connecting the outer canthus to the auricular apex remains parallel to the floor. The inner and outer canthus of the photographed eye should be visible, while the contralateral eye should be completely obscured.

Step 4: The standardized ruler is fixed in place and positioned horizontally above the subject's head. Capture a lateral facial photograph.

Step 5: Instruct the subject to sit facing forward and tilt their head backward as far as possible until the tip of the nose aligns with the midpoint between the eyebrows, ensuring the anterior nasal openings are fully visible.

Step 6: The standardized ruler is secured to the holder and positioned horizontally at the nasal tip, aligned with the nasal plane. Capture an inferior (submental) view photograph from below the chin.

Step 7: Record and document the procedure in the tracking log.

Figure 2.4. Posterior-Tilted Facial Photograph

2.2.3.4. Digital Image Measurement

- Image files were processed using image management software, with anatomical landmarks marked for analysis.

- Initially, images were standardized based on the reference ruler. Subsequently, angles and distances between anatomical landmarks were measured using VNCEPH 2017 software.

- The required indices were measured and recorded in the data table.

2.2.3.5. Variables for Analysis

The study includes 9 distance measurements, 4 angles, and 6 proportional indices.

Table 2.1. Studied Distance Measurements [59], [60]

No.	Variable	Measurement Method	Unit
1	Nasal Root to Subnasale Length (Na-Sn)	Distance from the nasal root (Na) to the subnasale (Sn), measured on a lateral facial image (Figure 2.5).	mm

No.	Variable	Measurement Method	Unit
2	Nasal Root to Pronasale Length (Na-Pn)	Distance from the nasal root (Na) to the pronasale (Pn), measured on a lateral facial image (Figure 2.6).	mm
3	Nasal Width (Al-Al)	Distance between the outermost points of the alar wings (Al), measured on a frontal facial image (Figure 2.7).	mm
4	Nasal Height (Pn⊥(Na-Sn))	Perpendicular distance from the pronasale (Pn) to the line connecting Na to Sn, measured on a lateral facial image (Figure 2.8).	mm
5	Nasal Base Width	Distance between the outermost points at the base of the alar wings, measured on a submental view (Figure 2.9).	mm
6	Nasal Tip Width	Distance between the intersection of the uppermost horizontal plane of the nostrils and the outer border of the alar wings, measured on a submental view (Figure 2.10).	mm
7	Nasal Base Height	Distance from the nasal tip to the straight line connecting both alar base points, measured on a submental view (Figure 2.11).	mm
8	Nasal Tip Height	Distance from the nasal tip to the horizontal plane at the superior margin of the nostrils, measured on a submental view (Figure 2.12).	mm
9	Lateral Border of the Nasal Base Triangle	Distance from the intersection of the alar base and the facial surface to the midpoint of the nasal tip, measured on a submental view (Figure 2.13).	mm

Figure 2.5. Measurement of Nasal Length (Na-Sn)

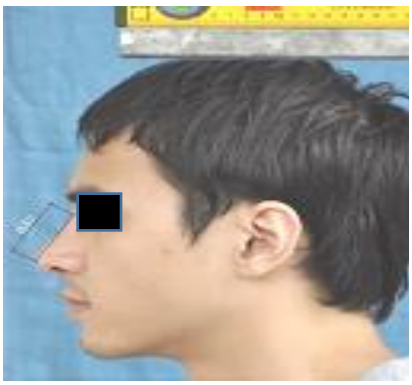

Figure 2.6. Measurement of Nasal Length (Na-Pn)

Figure 2.7. Measurement of Nasal Width (Al-Al)

Figure 2.8. Measurement of Nasal Height (Pn ⊥ Na-Sn)

Figure 2.9. Measurement of Nasal Base Height

Figure 2.10. Measurement of Nasal Base Width

Figure 2.11. Measurement of Nasal Tip Height

Figure 2.12. Measurement of Nasal Tip Width

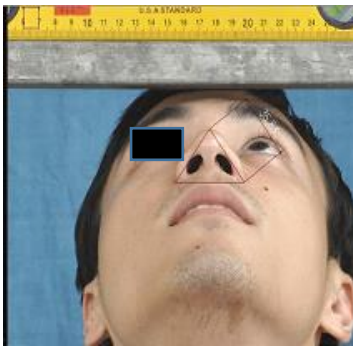

Figure 2.13. Measurement of the Lateral Side of the Nasal Base Triangle

Table 2.2. Studied Angles [59], [60]

No.	Variable	Measurement Method	Unit

1	Nasal-Frontal Angle	Angle formed by the tangent line passing through points Gl and Na with the straight line tangent to the nasal dorsum passing through Na (Figure 2.14).	Degrees (°)
2	Nasal-Labial Angle	Angle formed by the tangent line passing through points Ls and Sn with the tangent line through Sn and the most concave point in the middle of the nose Cm (Figure 2.15).	Degrees (°)
3	Nasal-Facial Angle	Angle formed by a vertical straight line passing through points Gl and Pog, intersecting the tangent line of the nasal dorsum passing through Na (Figure 2.16).	Degrees (°)
4	Nasal-Mental Angle	Angle formed by the tangent line passing through Na-Pn and the straight line from Pn to Pog (Figure 2.17).	Degrees (°)

Figure 2.14. Measurement of the Nasofrontal Angle

Figure 2.15. Measurement of the Nasolabial Angle

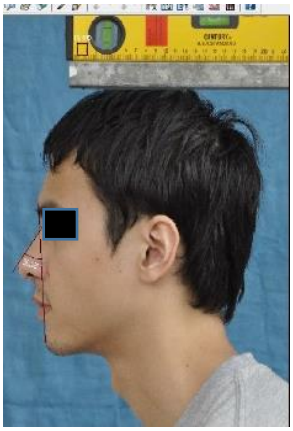

Figure 2.16. Measurement of the Nasofacial Angle

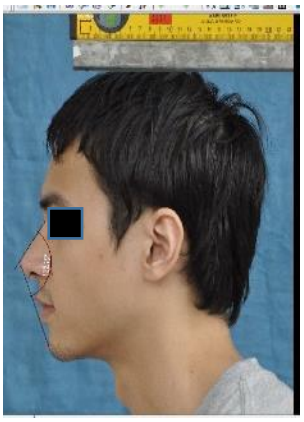

Figure 2.17. Measurement of the Nasal-Mental Angle

Table 2.3. Studied Ratios

No.	Variable	Measurement Method
1	Goode's Ratio	The ratio between the perpendicular distance from point Pn to the straight line Na-Al, representing the nasal length (Na-Pn). The formula used: (Pn-(Na-Sn))/Na-Pn (Figure 2.18).
2	Baum's Ratio	The ratio between the nasal length (Na-Sn) and the perpendicular distance from Pn to the straight line Na-Sn. The formula used: Na-Sn/(Pn-(Na-Sn)) (Figure 2.19).
3	Ratio of Nasal Width to Intercanthal Distance	Calculated by dividing the nasal width (Al-Al) by the intercanthal distance (En-En) on the frontal view (Figure 2.20).
4	Ratio of Nasal Bridge Length to Total Facial Height	Determined by dividing the distance from Na to Sn by the distance from Na to the lowest point of Me on the lateral view (Figure 2.21, Figure 2.22).
5	Ratio of Nasal Tip Width to Nasal Base Width	Calculated by dividing the width of the nasal tip by the width of the nasal base.
6	Ratio of Nasal Tip Height to Nasal Base Height	Determined by dividing the nasal tip height by the nasal base height.

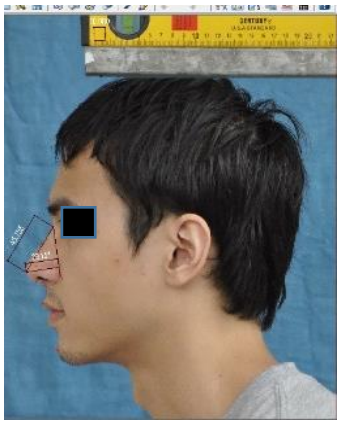

Figure 2.18. Measurement of the Goode Ratio (Pn-Y)/(Na-Pn).

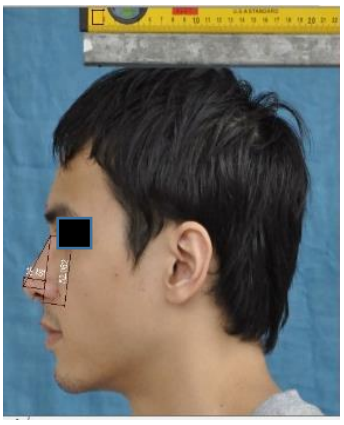

Figure 2.19. Measurement of the Baum Index (Na-Sn)/(Pn-X)

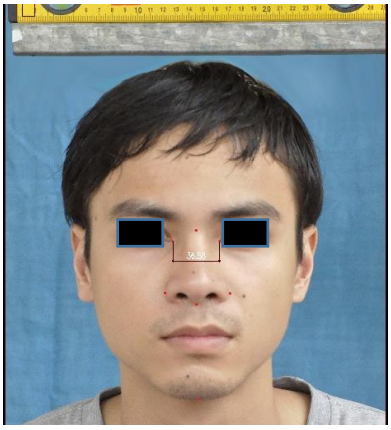

Figure 2.20. Measurement of Intercanthal Distance (En-En)

Figure 2.21. Measurement of Midface Height (Na-Sn)

Figure 2.22. Measurement of Midface and Lower Face Height (Na-Me)

Equipment use in this research to take photograph

**** Camera***

Nikon D500 camera with a Nikon 70-120mm f/4.5-5.6 lens.

Figure 2.1. Nikon D500 camera. Nikon 70-120mm f/4.5-5.6 lens.

**** Additional Equipment***

- Reflector
- Standardized ruler with a built-in level for balance adjustment
- Tripod for the camera and a stand for the standardized ruler
- Backdrop
- Chairs for both the model and the photographer
- Rectangular mirror (20x30 cm)
- Headband, hair clips, etc.