Figure 1.2: Illustrating the A- tip pinch grip and B- lateral (key) pinch.

Acknowledgement: www.sagepub.com
Figure 1.3: Muscles that help with the movement of the thumb.

Figure 1.4: Extrinsic muscles of the hand and thumb. (A) showing the superficial layer (B) showing the intermediate layer while (C) shows the deep layers of flexor muscles.

Figure 1.7: Illustrating the normal histology of the flexor tendon of the fingers (magnification x20) wherein Ent- endotendineum, Ept- epitendineum, Tf- collection of collagen in extra cellular matrix and TC- tendinocyte nuclei.

Figure 1.8: Illustrating the normal histology of the flexor tenosynovium (magnification x20) wherein T- flexor tendon, E- epitendineum, S- thin outer fibrous tendon sheath, TSS- tendon sheath space. The magnification is x20.

Figure 1.9: Skeleton of the hand (A), while (B) shows the carpal arch.

Figure 1.10: Cross section of the carpal tunnel.

Figure 1.11: Showing the different covering of a peripheral nerve.

Acknowledgement: www.sosondoc.egloos.com
Figure 1.15A: Accessory head of Flexor Pollicis Longus (Arrowed).
**Figure 1.15B**: Interconnection (🌟) between the Flexor Digitorum Profundus of ring finger (A) and little fingers (B).
Figure 1.15C: Interconnection (★) between the Flexor Digitorum Profundus of index finger (A) and Flexor Pollicis Longus (B).
Figure 2.1: Morphological types of muscle based on their general form and fascicular architecture.

Figure 2.2: Shows the relations of FPL, FDS, FDP, FCU and FCR.
Figure 2.4: Shows the method used to calculate the tendon length.
Figure 2.5: Illustrating the method used to calculate the tendon length of multipennate muscle (FDS). The mean of all the extra muscular tendon length up to the carpal tunnel were taken.
Midpoint of the muscle
(midpoint between the origin and distal Insertion of the muscle)

<table>
<thead>
<tr>
<th>Lateral angle</th>
<th>Medial angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°</td>
<td>12°</td>
</tr>
<tr>
<td>11°</td>
<td>15°</td>
</tr>
<tr>
<td>9°</td>
<td>12°</td>
</tr>
</tbody>
</table>

Mean 10° 13°

Angle of pennation 13°

**Figure 2.6:** Illustrating the method undertaken to calculate the midpoint and angle of pennation in a multipennate muscle.
Figure 2.8: Illustrating the FDS muscle after being removed from the cadaver for measuring the mass and density. Note that the intramuscular part of the tendon had been left intact.
Figure 2.11: Demonstrating the different angles of flexion of the right thumb, index and middle fingers in mid prone position. (A) at rest, (B): initial movement, (C): mid position and (D) fully flexed.
Figure 2.12: Demonstrating the different angles of flexion of the right thumb, index and middle fingers in supination position. (A) at rest, (B): initial movement, (C): mid position and (D) fully flexed.
FCR tendon removed 2cms above its bony insertion

FDP (index) tendon removed 2cms above the carpal tunnel

FPL tendon removed 2cms above the carpal tunnel

FDS (index) tendon removed 2cms above the carpal tunnel

FCU tendon removed 2cms above its bony insertion

Figure 2.13: Shows the five tendons that were used to calculate TCSA using the Image Pro-Plus software.
Figure 2.14: Shows the median nerve samples that were used to calculate the cross sectional area using the Image Pro-Plus software.
Table 3.1: Shows the general statistics of volunteer study.

200 medical students (Mean age 18 (females) and 21 years (males))

Number of students who played musical instruments as amateurs (from 0-grade 8) = 171 (103 females and 68 males)

Number of students non musicians = 29 (18 females and 11 males)

Number of students with tendinous interconnection = 10 (5%)

Number of students with tendinous interconnection = 2 (7%)

Females = 8
Males = 2
Females: male = 1:4

Females = 2

Overall percentage of interconnection = 6%
Figure 3.25: Illustrating the tenosynovial interconnection (Conn) between the FPL and FDP (Index) in the left hand of Volunteer ‘2’.

Interconnection - 0.5 cms
Thickness of interconnection - 0.2 cms
**Figure 3.26:** Illustrating the tenosynovial interconnection (Prob Conn) between the FPL and FDP (Index finger) in the left hand of Volunteer ‘3’.

- **Interconnection:** 0.8 cms
- **Thickness of interconnection:** 0.2 cms
Figure 3.27: Illustrating the probable tendinous interconnection (C) between the FPL and FDP (Index finger) in the right hand of Volunteer ‘9’. This was not very conclusive.
Figure 3.28: Illustrating the tendinous interconnection (C) between the FPL and FDP (Index finger) in the left hand of Volunteer ‘12’.

**Interconnection- 0.5 cms**
**Thickness of interconnection- 0.1 cms**
Interconnection - 0.2 cms
Thickness of interconnection - 0.2 cms

Figure 3.44: Illustrating the tendinous interconnection (C) between the FPL and FDP (Index finger) in the left hand of Volunteer ‘1’. Taken during repeatability and reliability study.