

1.1 Socio-Demographic and Clinical Characteristics of the Study Participants

Table 0.1: Socio-demographic and Clinical Characteristics of Study Participants

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	Mean $\pm$ SD	51.84 $\pm$ 21.26	-
	Minimum–Maximum	19 – 87	-
Sex	Male	34	68%
	Female	16	32%
Chronic diseases	No disease	17	34%
	Diabetes Mellitus	9	18%
	Hypertension	22	44%
	Diabetes & Hypertension	2	4%
Previous abdominal surgeries	Yes	10	20%
	No	40	80%

Table 4.1 illustrates that the study participants had a mean age of 51.84 ± 21.26 years, ranging from 19 to 87 years. Males constituted the majority of the sample (68%), while females represented 32%.

In terms of chronic diseases, hypertension was the most common condition (44%), followed by diabetes mellitus (18%), whereas 34% of participants had no chronic diseases. Additionally, 20% of participants had a history of previous abdominal surgeries, while 80% had no such history.

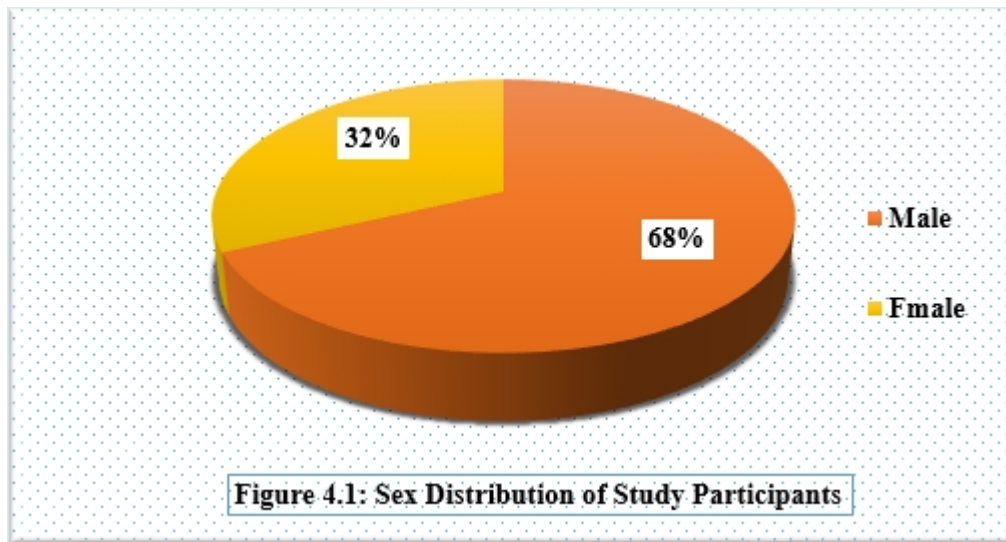


Figure 0.1: Sex Distribution of Study Participants

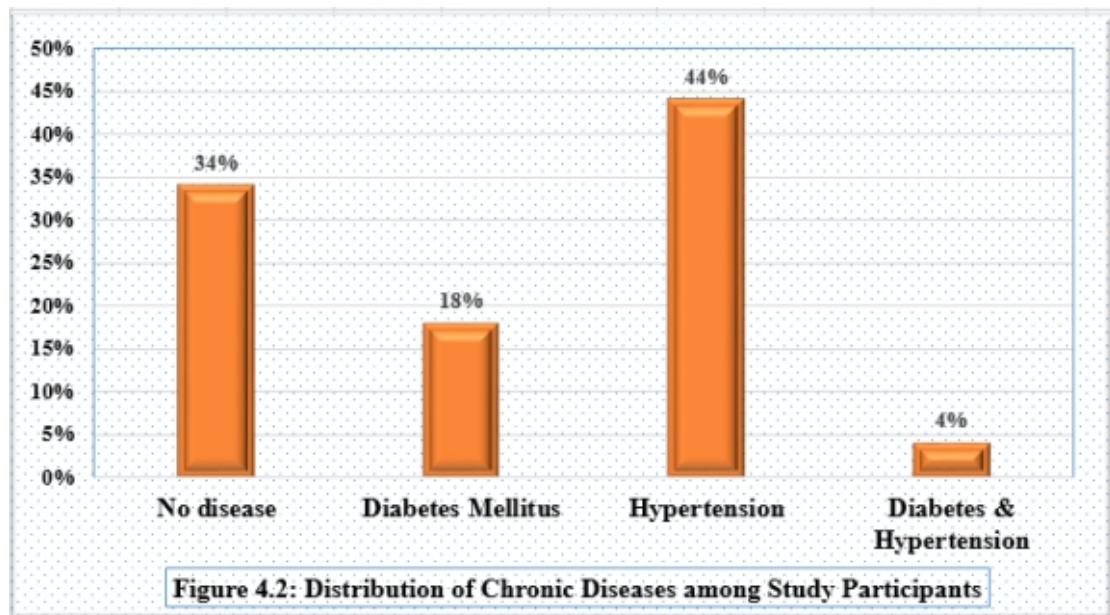


Figure 0.2: Distribution of Chronic Diseases among Study Participants

1.2 Prevalence of pyramidalis Muscle

Table 0.2: Distribution of Pyramidalis Muscle Presence

Category	Frequency (n)	Percentage (%)
Bilateral	26	52
Right side	3	6

Left side	1	2
Absent	20	40
Total	50	100

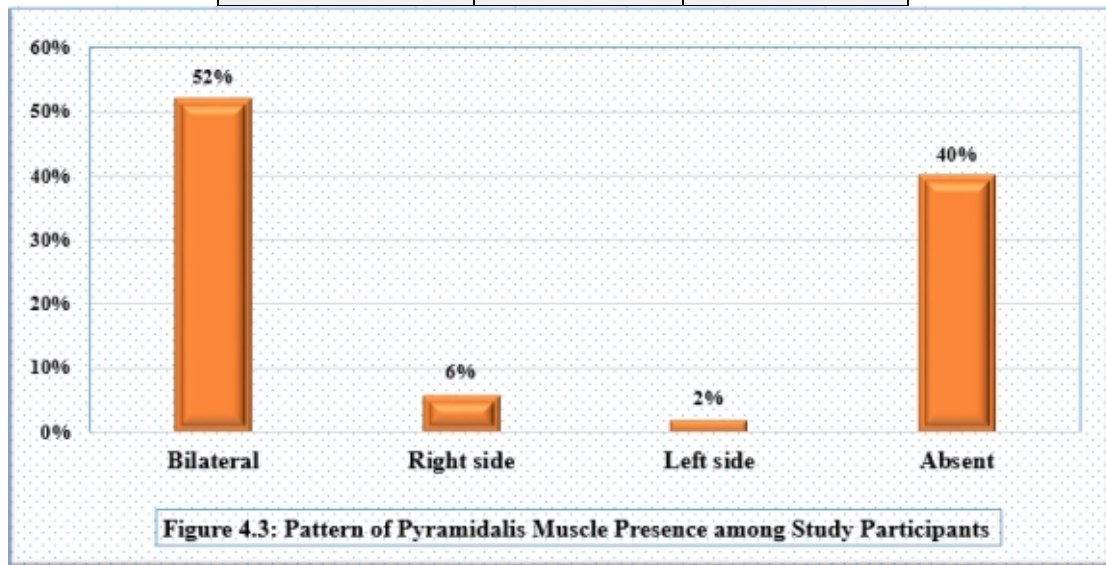


Figure 0.3: Pattern of Pyramidalis Muscle Presence among Study Participants

Table 4.2 shows the distribution of the pyramidalis muscle among the study participants. Bilateral presence was the most frequent finding, observed in 52% of cases. Unilateral presence was less common, with 6% on the right side and 2% on the left side. In contrast, the muscle was absent in 40% of the participants. These results indicate that the bilateral form of the pyramidalis muscle predominates in the studied sample.

1.3 Association between pyramidalis Muscle and Sex of Participants

Table 0.3: Association between pyramidalis Muscle and Sex of Participants

Sex	Present n (%)	Absent n (%)	Total	χ^2	df	P-value
Male	16 (47.1%)	18 (52.9%)	34	7.414	1	0.006
Female	14 (87.5%)	2 (12.5%)	16			
Total	30 (60.0%)	20 (40.0%)	50			

Table 4.3 demonstrates the association between the presence of the pyramidalis muscle and sex of participants. The results showed that the pyramidalis muscle was present in 47.1% of males and 87.5% of females, while absence of the muscle was more common among males

(52.9%) compared to females (12.5%). The Chi-square test revealed a statistically significant association between sex and the presence of the pyramidalis muscle ($\chi^2 = 7.414$, $df = 1$, $p = 0.006$).

1.4 Association between pyramidalis Muscle and Age of Participants

Table 0.4: Comparison of Mean Age According to Pyramidalis Muscle Presence

Presence of pyramidalis Muscle	Mean Age $\pm$ SD	t-value	df	P-value
Present	43.70 $\pm$ 20.02	-3.726	48	0.001
Absent	64.05 $\pm$ 17.10			

Table 4.4 presents the comparison of mean age according to the presence of the pyramidalis muscle among the study participants. Participants with the pyramidalis muscle had a lower mean age (43.70 $\pm$ 20.02 years) compared to those without the muscle (64.05 $\pm$ 17.10 years). The independent samples t-test revealed a statistically significant difference in mean age between the two groups ($t = -3.726$, $df = 48$, $p = 0.001$), indicating a significant association between age and the presence of the pyramidalis muscle.

1.5 Association between pyramidalis Muscle and Chronic Diseases

Table 0.5: Association between pyramidalis Muscle and Chronic Diseases

Chronic Diseases	Present n (%)	Absent n (%)	Total	χ^2	df	P-value
No disease	8 (26.7%)	9 (45.0%)	17	2.576	3	0.462
Diabetes Mellitus	7 (23.3%)	2 (10.0%)	9			
Hypertension	14 (46.7%)	8 (40.0%)	22			
Diabetes & Hypertension	1 (3.3%)	1 (5.0%)	2			
Total	30 (60.0%)	20 (40.0%)	50			

Table 4.5 illustrates the association between the presence of the pyramidalis muscle and chronic diseases among the study participants. Hypertension was the most common chronic disease among participants with the pyramidalis muscle (46.7%) and among those without

the muscle (40.0%). Diabetes mellitus was observed in 23.3% of participants with the muscle compared to 10.0% among those without it. The Chi-square test revealed no statistically significant association between chronic diseases and the presence of the pyramidalis muscle ($\chi^2 = 2.576$, $df = 3$, $p = 0.462$).

1.6 Morphometric Measurements of the pyramidalis Muscle

Table 0.6: Morphometric Measurements of the Pyramidalis Muscle

Variable	Mean $\pm$ SD	Minimum	Maximum
Muscle length	6.45 $\pm$ 2.76	2	10
Muscle thickness	1.10 $\pm$ 1.08	1	3

Table 4.6 presents the morphometric measurements of the pyramidalis muscle among participants in whom the muscle was present. The mean muscle length was 6.45 $\pm$ 2.76 cm, ranging from 2 to 10 cm. The mean muscle thickness was 1.10 $\pm$ 1.08 cm, with values ranging from 1 to 3 cm. These findings describe the anatomical variation in size of the pyramidalis muscle within the study population.

APPENDIX A

DATA COLLECTION FORM

Study Title: Prevalence and Morphometric Characteristics of the pyramidalis muscle in Blue Nile Region: A Cross-Sectional Study at Al-Damazin Teaching Hospital, Sudan (2025-2026)"

Hospital Name: Al-Damazin Teaching Hospital, AL-Damazin, Sudan

Date of Data Collection: ____ / ____ / ____

Patient ID (Code): _____

SECTION 1: DEMOGRAPHIC INFORMATION

1. **Age (years):** ____
 2. **Sex:** ☐ Male ☐ Female
 3. **Nationality:** ☐ Sudanese ☐ Other (Specify: _____)
-

SECTION 2: MEDICAL & SURGICAL HISTORY

4. **Type of Surgery Performed:**
 - ☐ Cystectomy
 - ☐ Prostatectomy

☐ Nephrectomy

☐ Hernia Repair

☐ Other (Specify: _____)

5. **Previous Abdominal Surgeries:** ☐ Yes ☐ No

○ If yes, specify: _____

6. **Congenital Abdominal Wall Deformities:** ☐ Yes ☐ No

○ If yes, specify: _____

7. **Relevant Comorbidities:**

☐ Diabetes Mellitus

☐ Hypertension

☐ chronic kidney disease

☐ Other (Specify: _____)

SECTION 3: INTRAOPERATIVE FINDINGS

8. **Presence of Pyramidalis Muscle:**

☐ Present (Bilateral)

☐ Present (Unilateral - ☐ Right / ☐ Left)

☐ Absent

9. **Muscle Morphology (if present):**

○ Length (cm): _____

○ Thickness (mm): _____

10. **Any Anatomical Variations Noted:** ☐ Yes ☐ No

• If yes, specify: _____

SECTION 4: DATA RECORDER DETAILS

Designation: ☐ **Consultant** ☐ **Specialist** ☐ **Resident** ☐ **Medical Officer**

Date: ____ / ____ / ____

النمرة: ج ز أ / ك د ع

التاريخ: 9 / 14 / 2025م

السيد / مدير عام مستشفى الدمازين

المحترم،

السلام عليكم ورحمة الله تعالى وبركاته،

الموضوع / طلب السماح لجمع بيانات لغرض البحث العلمي

نفيدكم بأن طالب ماجستير برنامج التشريح البشري بكلية الطب في جامعة الزعيم
الازهري عمر عبدالعزيز محمد عثمان تقدم بطلب جمع بيانات لغرض البحث العلمي من
مؤسستكم العريقة؛ نأمل كريم تفضلكم بمساعدته في توفير المعلومات والبيانات الضرورية
لإكمال بحثه.

ختاماً، نشتم ادواركم المتعاضمة في دعم البحث العلمي، ونتطلع لمزيداً مع التعاون.
ولكم مني فائق التقدير والاحترام



أ.د. أسامة نبيل محمد أحمد

عميد كلية الدراسات العليا



أ. أبوبكر يوسف محمد

مسجل الدراسات التطبيقية

Blue Nile Region
Research Ethical committee

15.18 Exemption approved

Date: 16-4-2025

Principal investigator: Dr. Omer Abdalazeez.

Address: Alzaiem Alazhari University – Faculty of Graduate Studies & Scientific Research

Tel: 00249964634433

Fax/Email: 3m2r62629@gmail.com

REC Reference: Blue Nile Region Rec Committee

ID No: RREC- BNR- 05

Title of Project: prevalence of the Pyramidalis Muscle among Urology Patients Undergoing Surgery at Al-Damazin Teaching Hospital, Sudan (2025).

Dear:

The chairman of the RegionHealth Research Ethics Committee has reviewed the above application & has determined that it is exempt from the requirements for full SHREC in compliance with the comply with the conditions & principles established by guidelines of Ethical Conduct of research Involving Human Subjects, 2017.

The exemption category is: concerning privacy in data collection tool

The research project may proceed but must comply by all other research ethics requirements, such as solicitation of protection of subject confidentiality & privacy. By taking off the coding in the questionnaire and the name of (surgeon/observer)

Yourssincerely, Committeeteamin behave of them:

Dr. Asfa Elnour Mohammed Elfaki



Note:

Please wipe off the patient code No & you rise in the questionnaire (as you explain in your confidentiality & (surgeon/observer) name privacy in the inform consent).